Replacement of Public Area with Service Area as a COVID-19 Safety House Design

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ABSTRACT: The existence of COVID-19 has created many safety procedures when people enter their homes. The need for immediate handwashing or spraying disinfectant has turned the public area of a house into a crucial place for filtering unwanted viruses. An adjustment to the house situation then becomes necessary, but hard to achieve especially in smaller houses. As a response to this current situation, this article proposes a recommendation in the form of rearrangement design. Data collection through questionnaires were performed to discover the habits that create the new flow of activities and the design is explored by taking samples from small houses that only have one access point. In conclusion, it was found that bringing the service area closer to the main entrance at the front of the house can accommodate the flow of activities that support COVID-19 safety procedures.

Keywords: small house design, house layout, COVID safety, service area

1 INTRODUCTION

1.1 *Residential Re-layout as a COVID-19 Prevention Method*

Since early 2020, the world has been facing a pandemic from Coronavirus disease (COVID-19). The disease and threat to public health is so prevalent in all populations that cleanliness in the home has become one of the major concerns in COVID-19 prevention as the virus might persist on surfaces for several days (Kampf et al., 2020). As the primary habitat for human beings, a residence needs to meet the criteria of comfort, safety, and health to support its occupants (Munif, 2009). As a result of that, the government through the Ministry of Health of the Republic of Indonesia (Kemenkes RI) encouraged citizens to comply with policies to prevent transmission of the COVID-19 virus from residential areas.

Nowadays, Indonesian houses generally start with a sitting area, a living room, or a common room that accommodates the whole family as well as a location to welcome guests. Before COVID-19, house occupants could place their belongings anywhere and directly lay down on the sofa without worrying about being contaminated with viruses. Now, we prefer washing hands before anything else and choose to change our clothes or take a shower before relaxing on the sofa. Thus, some modifications are required to adjust to the new flow of activity, mainly in the form of rearranging residential spaces and furniture.

Layout changes may not be a major problem for houses with spacious areas as there are flexible options for rearranging the furniture. However, even a minor furniture change could be difficult to apply in small-sized houses due to limited space that needs to be spared for movement and circulation. However, new safety and hygiene habits since COVID-19 have increased certain activities in the home regardless of the size of the house. This is a specific challenge for smaller houses since there isn't as much availability of space in which to accommodate those new activities (Schmidt, 2011). Room adaptation must be supported by the design of room layout in accordance with the needs and activities of these new habits. Therefore, layout changes are very important to support

new habits during and after this pandemic to maintain the health of the house's occupants and prevent the spread of the COVID-19 virus. Responding to this phenomenon, this paper proposes ideas for layout modifications for small-sized houses based on the COVID-19 safety protocols for the flow of activity.

1.2 Layout

Designing a layout is one of the most fundamental parts of interior design which takes a lot of analysis (White, 1983). In residential design, the number of occupants, space needs, space function, comfort, and safety are aspects to consider alongside aesthetic value (Simbolon and Nasution, 2017). The user aspect is a basic factor in designing a room—the concept of the room always adjusts to user activity. This activity will influence the sequence of space and affect the zoning area (Karlen and Fleming, 2016). The space planning process usually begins with defining the problems and is then translated into bubble diagrams of activity flow, followed by block plans, finally ending with layout design. The zoning area itself usually begins with a public space that is considered a free space where everyone can pass through (Snyder, 1979). In a level of a private house, that area can be the outdoor space, carport, terrace, or the sitting area after the main entrance that welcomes visitors. However, a public area does not mean that anyone is free to pass through or get in, but rather to separate the character of the space with more private areas, such as family room or bedrooms;; service areas contain spaces such as storage and a kitchen. Thus, the re-layout proposal in this article is designed following this method with a consideration that the zonation of a house is categorized into public, private, and service areas.

2 METHOD

This research is conducted in mixed quantitative and qualitative methods. The quantitative method is performed through a Google Form questionnaire of which there were over 240 respondents spread out from Sumatra, Java, and West Nusa Tenggara who shared their new household cleanliness procedures to prevent COVID-19 as well as difficulties with areas in their homes still in need of some adjustments. The next method is qualitative where we formulate the flow of activity based on the data collection through questionnaires and apply it to the layout samples taken from the smallest sized houses offered by real estate developers in the Podomoro Park Residence of Bandung and PIK 2 Residence by Agung Sedayu Group in Jakarta. Those home sizes were Akasha Type at 66 m², Asoka Type at 36 m², and PIK 2 Millennial Type at 60 m². Since the problem exists only in the public area of a house or in the transition space from public to private areas, the redesign experiment was only performed on the first floor, and the second floor remains unchanged as the whole area is private and already filtered by the floor below.

3 RESULT

3.1 A new flow of activity inside houses post COVID-19

The questionnaires collected information from respondents contained a variety of answer selections. First, we aimed to find out as many new safety and hygiene habits as possible as well as many obstacles as possible for implementing those habits in their houses. Four of possible selectable habits featured on the questionnaire are: (1) increasing the frequency of handwashing (91.3%), (2) changing clothes after outdoor activities (73%), (3) cleanse luggage or belongings after travel (57.7%), and (4) cleanse household surfaces that are exposed to physical contact, such as the floor, chair, doorknobs, etc. (50.2%). As for the obstacles, the most distinguished problems were (1) the lack of space for changing outfits near the house's entrance (91.3%), (2) the lack of a proper area for sorting items especially after a grocery trip (36.5%), followed by (3) the lack of space to store disinfectant products near the entrance (27%).

The second type of question was given in multiple choice format where respondents have to choose only the first activity they do when they first arrive at home: getting into the house, handling groceries, or receiving a delivery package. When respondents arrive without carrying a specific item in their hands, it is discovered that handwashing was the most common activity (66.4%) followed by directly taking a shower (16.2%). For the question about handling groceries and receiving delivery packages, the answer choices are in the form of several activities in different sequences and cases. The result shows that 55.6% still choose washing hands first before sorting groceries, but 34.9% choose to sort groceries first and then wash hands. For the case when they received a delivery package, 50.2% of the respondents choose to spray disinfectant first and 27% choose to directly open the package and then wash their hands.

There were also some unique habits found in the questionnaire. Whenever possible, several respondents chose to let the package sit for several days before opening it to ensure that any virus was inactive. Several respondents also show a better concern regarding natural daylight in their houses as a means of maintaining health.

The last type of question as given in the form of a short sentence where respondents were asked whether there is another habit or need regarding COVID-19 safety procedures at home that were not mentioned in the previous questions. Unexpectedly, there were such mentions of unresolved needs or items of concern that they wish to have in their houses, such as a dedicated quarantine area for an occupant who is sick, a place to store disinfecting products, and a designated spot to place their linen masks for reuse.

3.2 *Re-layout design*

Based on the flow of activity, it was seen that what is needed is a transitional space between public and private areas a home to filter unwanted particles that may harm the occupant's health. When the house has two accesses, usually one connects to the living room and the other one connects to the service area through the garage. Occupants can choose to use the service access to get into the house and keep the common and private areas of the house clean. Unfortunately, small houses with single entrances do not have this opportunity. To respond to this necessity in the era of COVID-19, we propose the idea of bringing the service area to the front of the house, as described in the samples below.

Sample 1 (Figure 1) shows that the first area of access is the living room (1a). With this situation, the occupants will need to trespass the living room with their possibly contaminated outfit and belongings before finding the closest access to wash their hands at the sink (1b). Thus, we

Figure 1. Rearrangement recommendation from Sample 1.
(Source. <https://podomoparkbandung.id/padmagriya/>, modified by authors)

recommend replacing the area of the living room with a kitchen and storage area (1c). This replacement will enable the occupants to wash their hands, place their items, spray them with disinfectant or sort, and store them directly immediately when they get into the house. The dining area (1d) is placed right after the kitchen and still has close access to the living room (1e).

Sample 2 (Figure 2) shows that the first area to access is the living room (2a) where there is no designated furniture to place storage facilities near the main access, but the access to the bathroom is close to the entrance (2b). Another problem that might occur is when the occupants need to sort items in the kitchen pantry (2c). Most likely, they will use the dining table (2d) that is supposed to be hygienic to place their groceries. To resolve the conflict, we recommend replacing the living room with a kitchen and storage area (2e) where occupants can wash their hands, place their items, spray them with disinfectant, or sort and store them directly once they get into the house. The new dining area (Figure 2f) is placed side by side with the kitchen and the living room (2g) is located at the corner with the orientation for space under the stairs that can be used for the TV and other electronic devices for family entertainment.

Figure 2. Rearrangement recommendation from Sample 2.
(Source: <https://podomoroparkbandung.id/padmagriya/>, modified by authors).

Sample 3 (Figure 3) has a different situation as the service area is already set at the back of the house and linked to the maid or house helper's room. This house also has a spacious area on the first floor where the addition of furniture is possible. The problem is that the living room (3a) blocks

Figure 3. Rearrangement recommendation from Sample 3.
(Source: <https://www.sedayuindocity.com/p/rumah-milenial-pik-2.html>, modified by authors).

the main access to the kitchen area (3b). Thus, we recommend replacing the television table (3c) with storage facilities (3d), rotate the orientation of the living room (3e) to widen the circulation width into the kitchen area (3f), and apply a small change in the kitchen which is moving the stove to the corner to keep the distance from the sofa.

4 DISCUSSIONS AND CONCLUSION

From the three samples provided, it is seen that preventing the spread of COVID-19 in small-sized houses is applicable by flipping the public areas and service area. The result from the re-layout design may not seem convenient for the flow of activity that we are accustomed to, but small houses with only a single entrance should not compromise the hygiene of the private area, especially in this era when we might have to live side by the side with the virus for the foreseeable future. Nevertheless, the proposed design comes as a result to the response to the new flow of household activities, where most occupants prefer to wash their hands before doing anything else and therefore need the shortest access from the entrance to running water, such as at the kitchen sink or bathroom.

However, the COVID-19 strategy that can be applied in small-sized houses where the limited dimensions of the home act as a hurdle. Even though the service area can be brought near to the entrance, the size cannot accommodate all the activities required to prevent the spread of COVID-19, such as providing an area to change clothes or having a designated spot for spraying disinfectant. In a small house, spraying disinfectant indoors may create another issue since the particles can spread to the adjacent area and intoxicate the occupants. Therefore, not only is prioritizing the service area essential, but interventions from the government might also be necessary to ensure that small-sized houses meet the standards of health and safety for residential buildings.

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