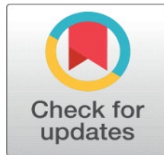
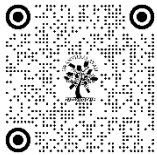


AN ASSESSMENT OF PARADIGM SHIFT IN PEOPLE'S PRIORITIES TOWARD INTERIOR DESIGNING OF SPACE DURING THE PANDEMIC OUTBREAK

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ABSTRACT

This investigation surfaces a thought of change in peoples' priorities toward Interior design of space during the Pandemic outbreak. It re-examines the issues that influenced the change in the overall arrangement of a physical space. Five constructs were identified to validate the paradigm shift in peoples' approach to dealing with spatial areas specifically in housing during the pandemic outbreak. The research study has shown a strong paradigm shift in the resident's approach to the interior design of housing. The research study also discusses about the issues faced while stay at home during COVID-19, spatial layout during the pandemic, the utility of space during the pandemic, and targeting to achieve the required resilience through design implications. There were 404 participants considered in the structured questionnaire survey where the snowball sample technique to distribute among the policymakers, planners, architects, interior designers, and general citizens, from various residential areas in the Chandigarh Capital Region (CCR) i.e., Chandigarh, Mohali, and Panchkula who responded on varied issues faced during COVID-19.

The outlook of people's approach and interior design community to post-COVID has offered a new opportunity to re-look at the spatial arrangement of interior space. The residential dwelling units that were earlier considered for relaxation, safety, and storage are now considered for online classes, office work, play areas, recreation, and exercise areas. The post-COVID-19 era has changed the outlook of habitable space by providing a new thought process to visualize a spatial layout uniquely, which may further full-fill multiple interests at the same time.

The research study not only focuses on residential dwelling units but also on the way people used their spaces and issues faced. Lack of proper spaces for classes, meetings, office works and other interested have changed the outlook people have perceive their spaces. And spaces during Covid-19 era have offered a fresh opportunity to rethink the design of any habitable space. Spaces with better adaptability, natural light, ventilation, and open spaces may have more potential of resilience than the space having poor ventilation, dingy and no open spaces. Clearly, in the research people of underprivileged were more susceptible to Covid infection and their recovery period may be longer as compared to the people living in planned and spaces residential dwelling units.

Keywords: Interior Design, Interior Designers, Habitable Space, Peoples' Perspective, Pandemic, Spatial Planning

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1. INTRODUCTION

Pandemics in the past vis-a-vis the Spanish flu, Russian Flu, European influenza epidemic in 1889, influenza 1918, Bubonic plagues, and US Pandemic Influenza A (H1N1) 2009, had a deadly impact on human history [Schuth \(2014\)](#), [Alexander \(1974\)](#), [Taubenberger & Morens \(2006\)](#), [Munnoli et al. \(2022\)](#) Pandemics in the past

have given lessons on how to treat a spatial interior layout during an outbreak [Taubenberger & Morens \(2006\)](#). Spaces for Quarantine, home isolation, and new ways of working will be remembered due to the past pandemics [Alexander \(1974\)](#), [Taubenberger & Morens \(2006\)](#), [Munnoli et al. \(2022\)](#).

The pandemic covid-19 has hampered the overall operations of cities, where Government policies implemented lockdowns, social distancing, and movement restrictions, which resulted in changed behaviours and mental health while at home as shown in [Figure 1](#) below [Zaher \(2020\)](#), [Sharifi et al. \(2020\)](#). Citizens were not used to sudden changes and therefore faced many professional and personal issues during the pandemic at home [Sharifi et al. \(2020\)](#). Many of the sectors like education, markets, transportation, residential areas, and public/private offices in the cities were highly impacted [Sharifi et al. \(2020\)](#). New age digitization of workspaces, home offices, urban governance policies, and data portals also guided the change in the functioning of any habitable interior space [Zaher \(2020\)](#), [Sharifi et al. \(2020\)](#). Smart cities and digital apps were considered for controlling and monitoring the lockdowns, people movement, and mapping of COVID cases through their command centres. [Chugh & Kumar \(2022\)](#). All major city administrations world-wide created COVID Command Centres from where the information, measures, instructions, mapping of cases with residential areas were channelised to control the COVID through big data and data intelligence. [Chugh & Kumar \(2022\)](#)

This pandemic has promoted new policies, new behaviour, new lifestyle, and new attitude which provide hope for renewed living in interior spaces for urban housing dwellers and ultimately may upgrade their priorities for spatial areas in a housing dwelling unit [Sharifi et al. \(2020\)](#), [Aldossary et al. \(2023\)](#), [Alahdal et al. \(2020\)](#).

1.1. PROBLEMS FACED IN THE TOWNS DURING THE PANDEMIC

Figure 1

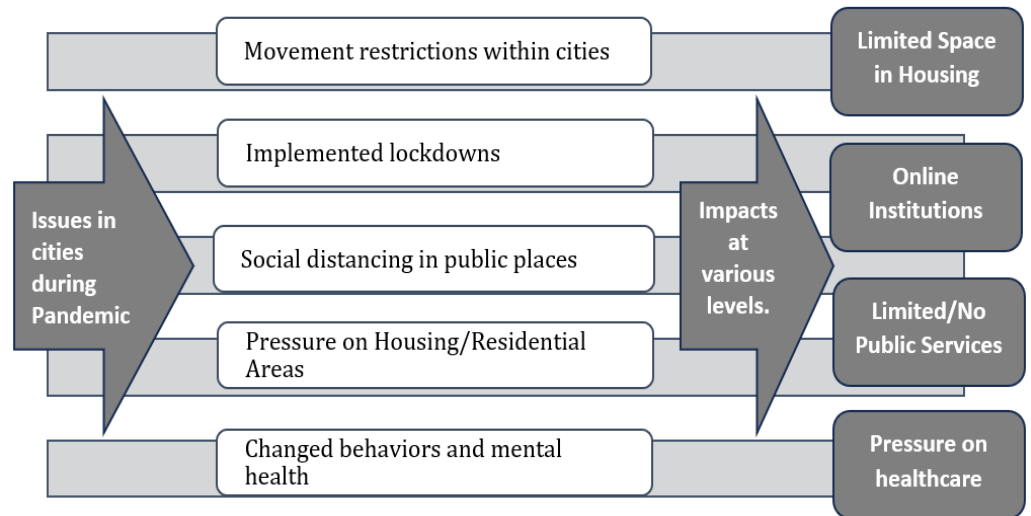


Figure 1 Listing of Issues in the Cities During the Pandemic
 Source [Zaher \(2020\)](#), [Sharifi et al. \(2020\)](#)

As shown in [Figure 1](#) below, cities suffered during the peak of the pandemic and so did the spatial areas vis-a-vis residential areas, office areas, recreational areas, and classrooms [Valizadeh et al. \(2022\)](#). People spent most of their time at home only,

where all the habitable spaces were redefined once i.e., bedrooms turned into offices, drawing rooms turned into play areas, the kitchen turned into classrooms and kid's areas turned to exercise areas and balconies turned into temporary workspaces, see [Figure 1](#) below. [Valizadeh et al. \(2022\)](#). A house is divided into many components for occupational needs, self-fulfilment needs, psychological needs, and basic needs [Gorman \(2010\)](#) therefore, a house may also offer relaxation needs, and safety needs due to COVID-19 at the same time [Alhadedy & Gabr \(2022\)](#), [Chugh & Kaur \(2023\)](#). The recent pandemic has offered a new outlook and a vision to perceive housing, a house, and a layout in a unique way. [Valizadeh et al. \(2022\)](#), [Alhadedy & Gabr \(2022\)](#).

Many research studies have shown the data that people having good economic status with spacious houses along with good neighbourhood facilities were resilient during the pandemic compared to low-income groups, slums, and squatters where proper internal spaces were not available and neighbourhood was not available [Oluwatosin et al. \(2020\)](#), [Okem et al. \(2022\)](#). Therefore, resilience in houses were seen where the income levels were high, which also means that having more built-up area there may be more amount of flexibility and safety. [Oluwatosin et al. \(2020\)](#)

The change in the internal spatial planning of a dwelling unit may vary according to the economic status [Oluwatosin et al. \(2020\)](#), [Okem et al. \(2022\)](#). Many residents faced issues during COVID-19 and were not mentally prepared for this challenge, either in terms of the need for space or for their change in lifestyles [Yun et al. \(2021\)](#), [Zaher \(2020\)](#). As shown in [Figure 1](#) above, Mental Health issues, spatial issues, presence of family members at home and related disturbances, lack of space for office work/domestic work, lack of space for online classes of their child, and change in hygiene, behaviour and lifestyle were a few to count which demanded a big transformation in the planning of a housing project and its internal design of built-up space [Alhadedy & Gabr \(2022\)](#), [Oluwatosin et al. \(2020\)](#), [Valizadeh et al. \(2022\)](#), [Zaher \(2020\)](#).

2. LITERATURE REVIEW AND HYPOTHESES

2.1. LITERATURE REVIEW

The ample availability of literature on housing and pandemic-related issues have focused on change in occupant's thinking abilities, social attitude, lifestyle, and behaviours [Chugh & Kaur \(2023\)](#) has raised the need for a renewed approach to a dwelling unit layout design, see [Figure 2](#) below [Oluwatosin et al. \(2020\)](#), [Yun et al. \(2021\)](#). The literature has also pointed out issues during the pandemic related to mental health, depression, discomfort, and negative behaviours due to shared interior spaces with other family members which ultimately resulted in a manifold increase in domestic violence, see [Figure 2](#) below [Chugh & Kaur \(2023\)](#), [Yun et al. \(2021\)](#), [Alahdal et al. \(2020\)](#). The requirement of extra space in a house for health issues when a family member in the house falls sick due to an infection of COVID-19, that is the time which pressurized whole of the family and demands more internal spaces, flexible spaces, and separate sanitation provisions [Oluwatosin et al. \(2020\)](#), [Zaher \(2020\)](#). Occupants having large-sized dwellings had the facilities to change their interior spaces anytime into a home quarantine or isolated spaces [Gür \(2022\)](#). On the other hand, people having less income, large household sizes, and slums faced serious challenges in mitigating the health crisis at the domestic level due to a lack of extra internal space for health emergency uses [Chugh & Kaur \(2023\)](#), [Oluwatosin et al. \(2020\)](#). The current health emergency has given a chance to change or modify the priorities for common spaces to create adaptable internal spaces for such critical situations [Aldossary et al. \(2023\)](#), [Alhadedy & Gabr \(2022\)](#), [Zaher](#)

(2020). The Pandemic was the time when occupants and interior designers realized to change their thought processes and priorities towards domestic and non-domestic activities jointly [Zaher \(2020\)](#). Issues like studying, sleeping, cooking, and playing have faced a shortage of interior spaces which may be handled only by changing the design priorities towards a spatial layout. [Alhadedy & Gabr \(2022\)](#), [Zaher \(2020\)](#).

The fact is not denied by scientists, virologists, epidemiologists, and doctors that there would be no future pandemic, instead, they mentioned in many varied journals that we should deal more cautiously with pandemics, and the future pandemics may be highly devastating in comparison to the current pandemic if no lessons are learned [Sharifi & Khavarian-Garmsir \(2020\)](#), [Chugh & Kaur \(2023\)](#). The design experts have discussed the policies with the industry leaders and policymakers for preparedness in such a situation of a health crisis, and accordingly, inculcate the spatial areas as well to handle the situation [Sharifi & Khavarian-Garmsir \(2020\)](#).

There are literature and case studies mentioning family lounges having the proper door to exteriors may later change into a home-isolation area to protect other family members from COVID-19 infection [Alhadedy & Gabr \(2022\)](#). Healthcare emergencies may be tackled by designing effective spatial areas [Alhadedy & Gabr \(2022\)](#), [Chugh & Kaur \(2023\)](#). Isolated areas with all basic amenities in a spatial area having natural light, sanitary, and greenery/open areas, etc may provide resilience during COVID-19 [Alhadedy & Gabr \(2022\)](#). Therefore, spatial designing is currently encountering a paradigm shift in planning and design approaches that can withstand future challenges and provide resilience for the occupants to future outbreaks [Alhadedy & Gabr \(2022\)](#).

Much of the literature has shown a way forward for designing transformable, adaptable, and convertible interior spaces, i.e., during the night-time a space is a bedroom, and, in the morning, it is an office, as shown in [Figure 4](#) & [Figure 5](#) below [Gür \(2022\)](#), [Alhadedy & Gabr \(2022\)](#), [Zaher \(2020\)](#). Likewise, in the daytime, it's a family lounge and at night it is converted into a bedroom, as shown in [Figure 4](#) & [Figure 5](#) below. With this approach, the usage and efficiency of internal spaces can be optimized by noting the current issues and devising changes in the spatial designs [Gür \(2022\)](#), [Alhadedy & Gabr \(2022\)](#), [Zaher \(2020\)](#).

Figure 2

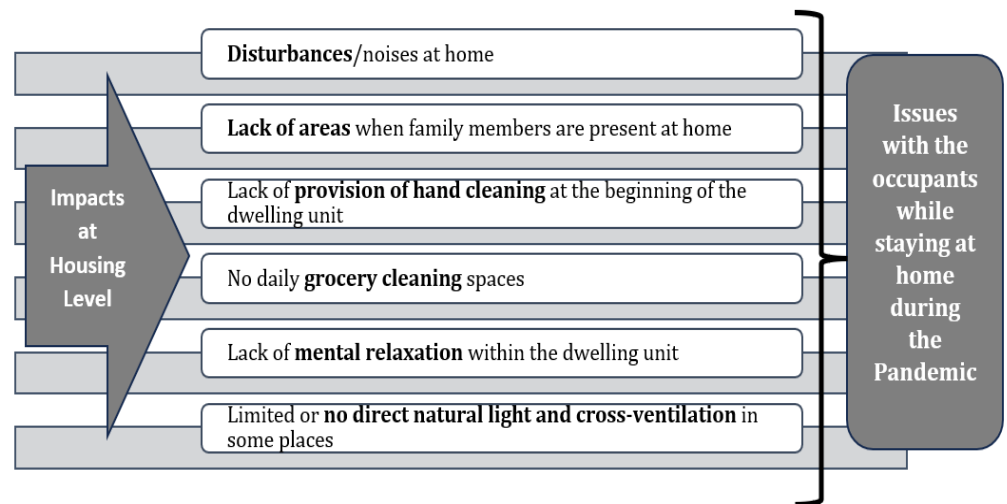


Figure 2 Issues with the Occupants While Staying at Home During the Pandemic
 Source [Gür \(2022\)](#), [Zaher \(2020\)](#)

2.2. HYPOTHESES

H1: There is a significant paradigm shift in people's priorities in reference to interior designing post-COVID.

The structured survey questionnaire with the snowball sample technique was filled by the respondents to get valid results and the survey conducted and analysis has shown a positive and significant relationship with the occupant's perspective in tackling spatial layouts post-covid [Gür \(2022\)](#), [Alhadedy & Gabr \(2022\)](#), [Valizadeh et al. \(2022\)](#), [Zaher \(2020\)](#). A Conceptual Model of hypotheses H1a, H1b, H1c and their inter-relationships is shown in the [Figure 3](#) below.

H1a-Classification of the Dwelling Unit (CDU) Vs Shift in daily behaviour (SDB)

The Hypothesis H1a may probably show a negative-perfect correlation, where reducing one aspect is responsible for an increase in other aspects i.e.:

- **Classification of the Dwelling Unit (CDU) Vs Health and Hygiene during COVID-19 (HHC):** A small size of a dwelling unit may probably result in a compromise in health and hygiene during COVID-19 (HHC), or a large size of a dwelling unit may probably result in a following the health and hygiene practices during COVID-19 (HHC). Similar issues are also mentioned in the research paper published by [Gür \(2022\)](#), [Chugh & Kaur \(2023\)](#), [Alhadedy & Gabr \(2022\)](#) which mentioned that many of the issues were dependent on the size of the dwelling unit to facilitate activities at home during the pandemic. The dwelling unit where the area was small faced more issues related to health and hygiene, whereas the dwelling units with larger areas were having more spaces to maintain health and hygiene. Moreover, during any COVID-19-infected member at home the larger units stayed resilient as compared to the small units as mentioned in the literature reviewed [Chugh & Kaur \(2023\)](#), [Gür \(2022\)](#)
- **Classification of the Dwelling Unit (CDU) Vs Kids Encountering issues (KEI):** A small size of a dwelling unit may probably result in Kids encountering issues during online classes (KEI), or A Large size of a dwelling unit may probably result in a reduction in issue faced by the Kids. The issues related to children encountering problems in attending classes are also mentioned in the literature reviewed [Valizadeh et al. \(2022\)](#), [Zaher \(2020\)](#) which says that many of the issues were dependent on the size of the dwelling unit. Larger size dwelling units were facing less/no issues as compared to the dwelling units having small sizes because of the availability of number of rooms and open areas to attend the classes and to play making life more balanced in the large dwelling units. [Valizadeh et al. \(2022\)](#), [Chugh & Kaur \(2023\)](#)
- **Classification of the Dwelling Unit (CDU) Vs Family members Encountering issues (FEI):** A small size of a dwelling unit may probably result in Family members encountering more issues during online classes (FEI), or a large size of a dwelling unit may probably result in a reduction in issue faced by the Family members during online classes (FEI).

Similarly, the issues related to family members encountering problems in attending online office meetings are also mentioned in the research paper published [Valizadeh et al. \(2022\)](#), [Zaher \(2020\)](#), [Alhadedy & Gabr \(2022\)](#) Many of the issues mentioned in the research were dependent on the size of the dwelling unit i.e., small sizes dwelling units were facing more issues as compared to the dwelling a unit

having larger size because of constraints in a greater number of family members with multiple activities and one has to attend their offices online and concentrate on daily office works. [Chugh & Kaur \(2023\)](#)

- **Classification of the Dwelling Unit (CDU) Vs Consciousness regarding keeping the house clean (CHC):** A small size of a dwelling unit may probably result in Less Consciousness regarding keeping the house clean (CHC), or large size of a dwelling unit may probably result in a more Consciousness regarding keeping the house clean (CHC). The research published by [Chugh & Kaur \(2023\)](#), [Gür \(2022\)](#) has mentioned in that almost all economic classes were conscious about keeping their house clean during the pandemic [Okem et al. \(2022\)](#). It is only due to constraints like the area of the dwelling units and the level of awareness was also restricting them to be conscious during the pandemic. [Okem et al. \(2022\)](#)
- **Classification of the Dwelling Unit (CDU) Vs Practice new activities during lockdown (PAL):** A small size of a dwelling unit may probably result in less Practice for new activities during lockdown (PAL), or a large size of a dwelling unit may probably result in a more Practice for new activities during lockdown (PAL). The similar results are published in [Alhadedy & Gabr \(2022\)](#), [Gür \(2022\)](#) where the author has mentioned that the occupants have practiced new activities and hobbies while staying at home. The activities vis-a-vis craft making, dancing, yoga, exercising etc were a constraint in dwelling units having limited areas and more households.

Therefore, the results to be analysed may probably state a significant relation in the parameters of Classification of the Dwelling units (CDU) with Shift in daily behaviour (SDB). To find out the relationship between the variables of COD and SDB Chi-Squared Analysis for H1a shall be applied.

Figure 3

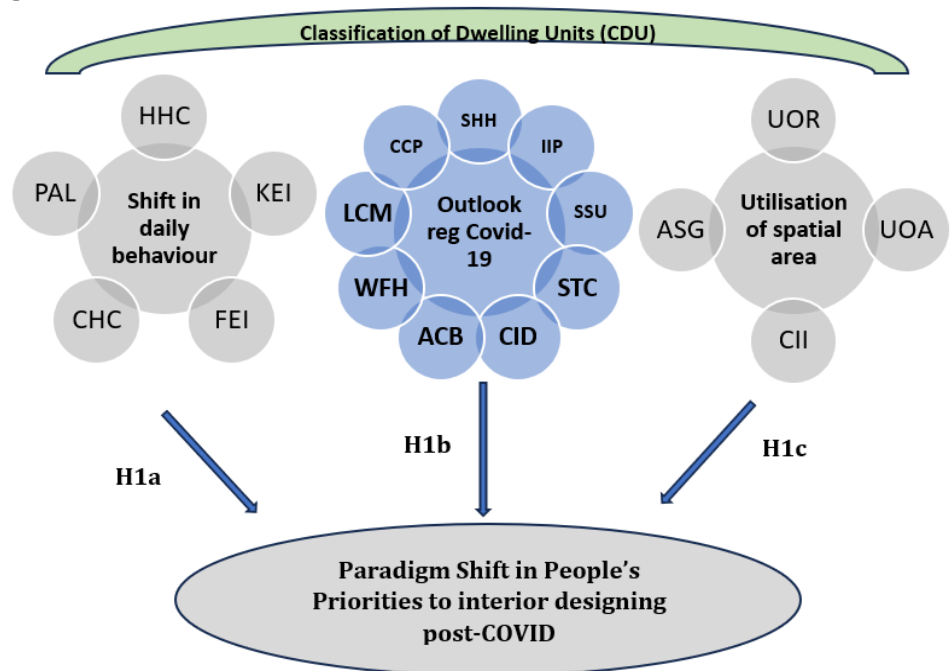


Figure 3 Conceptual Model of Hypothesis H1a, H1b, H1c.

Source Author

H1b-Classification of the Dwelling Unit (CDU) Vs Outlook reg Covid-19 (ORC)

This may show that people of all categories and income classes may probably have taken care of following measures to maintain health hygiene during COVID-19. See [Figure 3](#) above, for a conceptual framework of correlation between the parameters.

- Stay at home helps to reduce the spread of the virus. (SHH)
- Isolate infected people (IIP)
- Stop schools and universities can reduce (SSU)
- Closure of crowded places (CCP)
- Stop travelling between cities. (STC)
- Limiting within-city movement (LCM)
- Adopting covid appropriate behaviour (ACB)
- Working from home (WFH)
- Change in diets (CID)
- Increased focus on immunity food (IIF)

Many of the research published and literature reviewed have mentioned the issues of maintaining health and hygiene through varied parameters and preferences by the occupants. Due to the sudden health crisis and change in outlook towards personal health and hygiene, people changed their attitude towards COVID-19. Staying at home, isolating, not going to the educational institutions, not going to the crowded places, stopping travel from major cities, limiting city movement, adopting COVID measures, working from home and change in diets were highly preferred among public in all most all towns. [Yun et al. \(2021\)](#), [Sharifi & Khavarian-Garmsir \(2020\)](#), [Gür \(2022\)](#), [Chugh & Kaur \(2023\)](#)

Therefore, the results to be analyzed may probably state a significant relation in the parameters of Classification of the dwelling unit (CDU) with Outlook reg Covid-19 (ORC). To find out the relationship between the variables of COD and ORC, one-way ANOVA test for H1b shall be applicable to find out the relation between the variables.

H1c-Classification of the Dwelling Unit (CDU) and Utilisation of spatial area in the dwelling unit (USD) may probably show a positive perfect co-relationship, see [Figure 3](#) above, for a conceptual framework of correlation between the parameters. The area of a dwelling unit was compared with the:

- **Classification of the Dwelling Unit (CDU) Vs Utilization of rooms (UOR):** A small size of a dwelling unit may probably result in limiting utilization of rooms (UOR) Practice for new activities during lockdown (PAL), or a large size of a dwelling unit may probably result in more utilization of rooms (UOR). As per the literature reviewed, during the COVID peak, the usage of houses was not fixed due to the availability of family members at home and all having varied personal activities of either attending classes, attending the office, doing exercises, and/or learning anything new from online sources have vanished particular use of any area. People converted their bedrooms to an office during working hours, drawing rooms were converted into yoga or exercise areas, smaller rooms, and balconies were converted for online classes for kids. Due to this there was no usage of a room fixed for morning, evening and night as mentioned

in the published research. [Gür \(2022\)](#), [Alhadedy & Gabr \(2022\)](#), [Zaher \(2020\)](#) The much-required flexibility during COVID was only possible in dwelling units having larger areas instead of smaller units.

- **Classification of the Dwelling Units (CDU) Vs utilization of open areas (UOA):** A small size of a dwelling unit may probably result in limiting utilization of open areas (UOA) during lockdown, or a large size of a dwelling unit may probably result in a more Practice for new activities during lockdown in open areas. As mentioned above for utilisation of rooms, similar flexibility was possible in larger units for open areas where the options of having a veranda, balcony, terrace, front yard, backyard, or a garden during lockdown as compared to the dwelling units having small sizes. [Gür \(2022\)](#), [Oluwatosin et al. \(2020\)](#), [Valizadeh et al. \(2022\)](#) The option of doing any activity in open areas were more common in larges dwelling units instead of smaller units.
- **Classification of the Dwelling Unit (CDU) Vs Cases of COVID-19-infected family members during health issues (CII):** A small size of a dwelling unit may probably result in less or no availability of extra room for infected members for quarantine or a large size of a dwelling unit may probably result in availability of extra spaces for COVID infected family members having health issues (CII)). As mentioned in the published research of [Gür \(2022\)](#) the size of the dwelling units has given an extra option to safeguard their family members by isolating through providing a separate quarantine area and this was possible where the occupants have more incomes and larger houses. [Alhadedy & Gabr \(2022\)](#), [Chugh & Kaur \(2023\)](#) The provision of an isolation area was combined with a toilet having washing area and a bath area where they can maintain their health or daily routines during the quarantine period. Therefore, the size of dwelling units, as per the literature review has shown signs of having resilience for larger units as compared to the smaller units.
- **Classification of the Dwelling Unit (CDU) Vs the area used to sanitize daily groceries (ASG):** A small size of a dwelling unit may probably result in less area used to sanitize daily groceries (ASG) or a large size of a dwelling unit may probably result in a more area used to sanitize daily groceries (ASG). As per the literature studied [Chugh & Kaur \(2023\)](#), [Gür \(2022\)](#), [Alhadedy & Gabr \(2022\)](#), it depends a lot on a unit size which can offer extra space or a buffer area before entering a house to sanitize or wash groceries. Very little possibility was available in front of the smaller units as compared to the larger units where the spare area decided the safety of the occupants during COVID. The spread may be limited in case of the groceries are washed or sanitized at the entry of the house to avoid any spread of infection through the surface of the grocery packets.

Therefore, the results to be analyzed may probably state a significant relation in the parameters of Classification of the dwelling (COD) with the Utilisation of spatial area in the dwelling unit (USD). To find out the relationship between the variables of COD and USD, Chi-Squared Analysis for H1a shall be applied.

3. RESEARCH METHODOLOGY

3.1. SURVEY INSTRUMENTS-QUESTIONNAIRE DESIGN

The purpose of the structured household survey was to get the actual ground conditions of the pandemic time in the form of opinions, attitudes, and experiences.

It's the residents who faced varied issues during the pandemic while staying at home. Lack of space, disturbances due to family members, health/hygiene maintenance, new provisions at home, sanitation at the dwelling level, and change in attitude and behaviour are a few of the matters which were mentioned in the published literature.

The target income class was 03 sections of the society i.e., the Lower-income group having 1-BHK unit, the Middle-income group having 2-BHK unit, and Higher-income group having 3-BHK unit. The selection was to select all groups in a society to get unbiased responses, to compare their extreme conditions, and consequences happened during the pandemic. Therefore, a city-based cross-sectional survey was conducted through a structured questionnaire, through the snowball sampling method, having a 5-point Likert scale of Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree, to measure the opinions, attitudes, and behaviour of the respondents. The structured survey was conducted among households of Chandigarh Capital Region (CCR) i.e., Chandigarh, Mohali, and Panchkula from November 2022 to January 2023.

The pilot study of 42 respondents was conducted to test the questionnaire before the actual survey of 404 responses selected. The structured and systematic random sampling technique from the residential sectors of Chandigarh Capital Region (CCR) i.e., Chandigarh, Mohali, and Panchkula during the pilot survey. The final data was collected through face-to-face interview techniques and telephonically as well. Further, the data was entered carefully and analyzed by using a statistical package for the social sciences version 24, considering P-values < 0.001 as statistically significant.

3.2. DATA COLLECTION

An overall 404 participants were considered in the structured questionnaire survey through snowball sampling technique including doctors, nurses, engineers, architects, interior designers, and general citizens, from lower-income groups having 1-BHK unit, middle-income groups having 2-BHK unit, and high-income groups having 3-BHK unit, residential areas in the Chandigarh Capital Region (CCR) i.e., Chandigarh, Mohali, and Panchkula. Only after a pilot study, the questionnaire was revised and finalized, and considered standard with scaled items taken from the literature reviewed. The standard research analysis tools chi-square and one-way ANOVA test have been tested for the analysis of the proposed research model.

3.3. DEMOGRAPHIC STATUS OF CHANDIGARH CAPITAL REGION

The demographic status during the structured survey is as follows in [Table 1](#) below, where 224 male participants with 180 female participants from varied residential areas of Chandigarh Capital Region (CCR) i.e., Chandigarh, Mohali, and Panchkula.

Table 1

Table 1 Demographic Status of the Study Conducted			
		Frequency	Percent
Gender	Male	224	55.5%
	Female	180	44.5%
Age	<=20	55	13.5%

	21-29	143	35.25%
	30-39	98	24.0%
	40-49	75	18.5%
	>50	33	8.0%
	Total	404	100.0%
		Frequency	Percent
Number of Occupants with kids	1-4	110	27.25%
	4-7	111	27.50%
	8-11	115	28.50%
	>12	68	16.75%
	Total	404	100.0%
Residence Type		Frequency	Percent
	Lower-income group (LIG), Middle-income group (MIG),	213	52.75%
	Higher-income group (HIG) areas	191	47.25%
		404	100.00%

Source Author, 2022-23

4. DATA ANALYSIS

The results were statistically analyzed, and the data collected is positively significant in computing the peoples’ priorities towards internal housing spaces & neighbourhoods using “Chi-square and one-way ANOVA test”. Attributes of an area, and context have resulted in deciding the paradigm shift in the approach. The given [Table 2](#), [Table 3](#) & [Table 4](#) below have shown the results of the structured survey and analysis conducted as significant under chi-square, therefore, it can be cited that there is a change in people’s priorities toward internal housing spaces & neighbourhoods.

As shown in [Table 2](#) below are having the parameters listed for comparison in the classification of the Dwelling Units (CDU) Vs shift in daily behaviour (SDB) has shown a negative-perfect correlation with a p-value 0.0001, where reducing one aspect is responsible for an increase in other aspects i.e. Reducing the size of a dwelling unit resulted in a compromise in health and hygiene during COVID-19 (HHC), Kids were encountering issues in the course of online classes (KEI), family members were encountering issues while staying at home (FEI), consciousness regarding keeping the house clean (CHC), practice new activities during lockdown (PAL). Therefore, the results analyzed are significant as per the area of a dwelling and are done with the “chi-square analysis tool”.

Table 2

Table 2 Classification of the Dwelling Units (CDU) Vs Shift in Daily Behaviour (SDB)					
Classification of the dwelling units (CDU) Vs Shift in daily behaviour (SDB)					
Classification of the dwelling	Shift in daily behaviour	Gamma	p-value	Co-relation	Results
0-100 sqmts	HHC	-.398	.0001	negative perfect Co-relationship	Significant
101-200 sqmts	HHC				

201-300 sqmts	HHC				
301-400 sqmts	HHC				
401-500 sqmts	HHC				
More than 501	HHC				
0-100 sqmts	KEI	-.711	.0001	negative perfect Co-relationship	Significant
101-200 sqmts	KEI				
201-300 sqmts	KEI				
301-400 sqmts	KEI				
401-500 sqmts	KEI				
More than 501	KEI				
0-100 sqmts	FEI	-.598	.0001	negative perfect Co-relationship	Significant
101-200 sqmts	FEI				
201-300 sqmts	FEI				
301-400 sqmts	FEI				
401-500 sqmts	FEI				
More than 501	FEI				
0-100 sqmts	CHC	-.523	.0001	negative perfect Co-relationship	Significant
101-200 sqmts	CHC				
201-300 sqmts	CHC				
301-400 sqmts	CHC				
401-500 sqmts	CHC				
More than 501	CHC				
0-100 sqmts	PAL	.039	.398	positive perfect Co-relationship	Significant
101-200 sqmts	PAL				
201-300 sqmts	PAL				
301-400 sqmts	PAL				
401-500 sqmts	PAL				
More than 501	PAL				

Source Author, 2022-23

The parameters of Classification of the dwelling units (CDU) and Outlook reg COVID-19 (ORC) have shown a significant co-relationship in Table 3 below, having a p-value of 0.0001 through “One way ANOVA test”, which indicated that the factors have a significant co-relationship. Hence, it can be mentioned that people’s perspective has changed toward spatial consciousness. This also shows that people of all categories and income classes have taken care of health & hygiene during COVID-19.

Table 3

Table 3 Classification of the Dwelling (CDU) Vs Outlook Reg Covid-19 (ORC)							
Classification of the dwelling units (CDU) Vs Outlook reg Covid-19 (ORC)							
Classification of the dwelling	Outlook reg Covid-19	N	Mean	Std. Deviation	F-value	p-value	Results

0-100 sqmts	119	4.120	0.521	4.958	.0001	Significant
101-200 sqmts	159	3.721	0.882			
201-300 sqmts	46	3.820	0.909			
301-400 sqmts	38	3.916	0.916			
401-500 sqmts	25	4.150	0.874			
More than 501	17	4.128	1.145			

Source Author, 2022-23

The parameters Classification of the dwelling (CDU) and utilization of spatial arrangement in the dwelling unit (USD) have shown a positive perfect co-relationship in Table 4 below and resulted as significant. The area of a dwelling unit was compared with the utilization of rooms (DUR), utilization of open areas (UOA), cases of COVID-19 infected family members during health issues (CII), and the area used to sanitize daily groceries (ASG). Hence, it can be mentioned that people's perspective has changed toward spatial consciousness.

Table 4

Table 4 Classification of the Dwelling Units (CDU) and Utilisation of Spatial Area in the Dwelling Unit (USD)						
Classification of the dwelling units (CDU) vs. utilization of spatial area in the dwelling unit (USD)						
Classification of the dwelling	Utilization of spatial area in the dwelling unit	Gamma	p-value	Co-Relation	Results	
0-100 sqmts	DUR	12.41	.011	positive perfect Co-relationship	Significant	
101-200 sqmts	DUR					
201-300 sqmts	DUR					
301-400 sqmts	DUR					
401-500 sqmts	DUR					
More than 501	DUR					
0-100 sqmts	UOA	.289	.0001	positive perfect Co-relationship	Significant	
101-200 sqmts	UOA					
201-300 sqmts	UOA					
301-400 sqmts	UOA					
401-500 sqmts	UOA					
More than 501	UOA					
0-100 sqmts	CII	-.489	.0001	negative perfect Co-relationship	Significant	
101-200 sqmts	CII					
201-300 sqmts	CII					
301-400 sqmts	CII					
401-500 sqmts	CII					
More than 501	CII					
0-100 sqmts	ASG	-.241	.0001	negative perfect Co-relationship	Significant	
101-200 sqmts	ASG					
201-300 sqmts	ASG					

301-400 sqmts	ASG
401-500 sqmts	ASG
More than 501	ASG

Source Author, 2022-23

5. DISCUSSION AND CONCLUSIONS

5.1. DISCUSSION

During the survey conducted, there were different responses from the lower income groups having 1-BHK unit, middle income groups having 2-BHK unit and higher income groups having 3-BHK unit as all have different lifestyles, behaviours, habitable areas, neighbourhoods, and attitudes during the pandemic. Therefore, all groups have shown contrasting results because of their different dwelling unit sizes, different health-hygiene practices, and different household sizes. [Okem et al. \(2022\)](#) Many of the policymakers and designers have discussed resilience in designed communities. Some of the residential areas which were designed have shown signs of resilience and protection from the spread of the COVID because of their maintained buffer areas, quality neighbourhood, defined statutory byelaws, wider roads, quality parks/open areas, available convenient shopping, extra rooms in the house, better natural light, ventilation, and open terraces or parks in their houses. [Aldossary et al. \(2023\)](#) These available spatial arrangements in the higher-class communities make society resilient in many ways from the pandemic as compared to the societies that are low-income societies. [Aldossary et al. \(2023\)](#) The low-income societies are susceptible as they can't maintain health and hygiene properly, lesser supply of sanitation, have less or no natural light, less/no ventilation, no open areas in the house, no extra rooms, their societies also have narrow streets, poor neighbourhood and fewer/no convenient shopping which makes a poor society more susceptible to the Pandemics [Okem et al. \(2022\)](#). The recovery period of the poor and underprivileged is longer as compared to the economically strong communities due to differences in facilities like sanitation and neighbourhood. [Chugh & Kaur \(2023\)](#)

Through the survey conducted and analysis, it is found that there is a need for transformation of the housing planning and internal residential spaces required post-COVID-19 keeping in mind the possibility of future outbreaks [Gür \(2022\)](#), [Chugh & Kaur \(2023\)](#), [Alhadedy & Gabr \(2022\)](#). The chosen indicators have shown significant changes in peoples' awareness and behaviours due to frequent changes happening in the categories of dwelling units, neighbourhood facilities, income status, occupation category, usage of dwelling units, and household size. The paradigm shift in peoples' priorities during the COVID-19 has offered a new opportunity for occupants, interior designers, residential architects, developers, industry leaders, and academicians to re-examine their outlook toward housing planning and internal spatial layouts in space [Chugh & Kaur \(2023\)](#), [Alhadedy & Gabr \(2022\)](#).

Survey respondents of lower-income groups having 1-BHK unit, middle-income groups having 2-BHK unit and higher-income groups having 3-BHK unit during the survey and the analysis have shown fresh trends in peoples' priorities in managing an area during the pandemic [Chugh & Kaur \(2023\)](#), [Alhadedy & Gabr \(2022\)](#). The occupants have discussed that there were many issues like disturbances/noises at home, lack of areas, lack of provision of hand cleaning at the beginning of the dwelling unit, no daily grocery cleaning spaces, lack of relaxation within the

dwelling unit, limited or no direct natural light and cross-ventilation during the stay at home, which is in line with the literature studied [Gür \(2022\)](#), [Zaher \(2020\)](#), [Alhadedy & Gabr \(2022\)](#). On the other hand, the HIG societies have not shown much of problems due to their larger houses offering more transformability to perform domestic activities. Also, the occupants felt that there was a lack of need-based designs of the dwelling unit which needs to be considered in the designs during one of the interviews conducted with the citizens. Adaptable internal spaces, flexible spatial arrangements, convertible internal spaces, and convertible furniture might be the required elements that are currently not in use and are mentioned in the literature studied [Alhadedy & Gabr \(2022\)](#), [Zaher \(2020\)](#), [Chugh & Kaur \(2023\)](#). Spatial areas have the strength to adapt themselves in times of dire requirement if designed efficiently, where a family lounge can be converted easily into a daily exercise area having ample natural light with cross-ventilation as mentioned in the literature studied [Alhadedy & Gabr \(2022\)](#).

The underlined thing analyzed through this research is that the reworking of the planning and design of a housing layout may address work-from-home spaces, flexibility in spaces, convertible home/office furniture, in-house play areas, exercise spaces, and self-isolation or quarantine spaces for Lower income groups having 1-BHK unit, Middle income groups having 2-BHK unit and higher income groups having 3-BHK unit communities. [Alhadedy & Gabr \(2022\)](#), [Gür \(2022\)](#)

5.2. CONCLUSIONS

It can be concluded that the pandemic COVID-19 as a healthcare crisis proved to bring a change in general people's priorities toward spatial habitable areas of Low income and medium income communities [Alhadedy & Gabr \(2022\)](#), [Chugh & Kaur \(2023\)](#). The situation of the pandemic has given an opportunity to the occupants, architects, interior designers, academicians, and industry leaders to rethink the ordinary approach to housing planning and provide a design option fit for adaptability in nature [Chugh & Kaur \(2023\)](#). The new and basic thought process is to be considered more adaptable spaces and resilience through planning and designing any spatial arrangement as mentioned in the literature studies [Alhadedy & Gabr \(2022\)](#). As discussed in the conducted survey, people were spending maximum time during the pandemic in an interior space, and therefore a good design needs more care to consider psychological health and mental health, which is discussed in the literature studied as well [Yun et al. \(2021\)](#). A dwelling unit as space has become a requirement during the pandemic as a multi-facet area where a resident may spend time not just for sleeping and relaxing but also for working, studying, and recreation, as mentioned in the research [Aldossary et al. \(2023\)](#), [Alahdal et al. \(2020\)](#). Overcoming the issues faced during the pandemic provided a newer thought towards designing and safeguarding people and creating resilient design spaces. [Chugh & Kaur \(2023\)](#), [Alhadedy & Gabr \(2022\)](#).

Furthermore, a paradigm shift towards residential planning and internal habitable space may result in more resilience during a health crisis through inclusive designs [Aldossary et al. \(2023\)](#), [Chugh & Kaur \(2023\)](#). The efficient usage of cross-ventilation, natural light, convertible space, and open area may enhance the efficacy of a dwelling unit when designed in line with learnings from this pandemic [Aldossary et al. \(2023\)](#), [Chugh & Kaur \(2023\)](#).

It can be concluded that the above-reviewed literature, survey conducted, and analysis state that there is a significant paradigm shift in people's priorities in reference to interior designing post-COVID. The parameters of dwelling units and behaviour during COVID and daily practices have shown a strong relationship to

state there is a Paradigm Shift in People's Priorities toward Interior Designing of Space during the Pandemic Outbreak.

6. RECOMMENDATIONS

After reviewing the literature, conducting the primary survey, analysis, and discussion on the research, the following categorical recommendations may be followed:

6.1. PLANNING & POLICY-LEVEL RECOMMENDATIONS

- During the primary survey and the literature reviewed, it was seen that many sectoral jobs were working mostly online at home, therefore, several issues are being noted and reported by the occupants during the survey which can be part of new-age design strategies to achieve quality and resilience in a spatial environment. [Sharifi & Khavarian-Garmsir \(2020\)](#), [Alhadedy & Gabr \(2022\)](#)
- Through the conducted survey it can be recommended that there is a dire need for updates in building codes for Lower Income Groups having 1-BHK unit, Middle income groups having 2-BHK unit, and Higher income groups having 3-BHK unit housing dwellings after the pandemic, where the provision of convertible, flexible spaces, and adaptable spaces is to be considered to achieve resilience at all dwelling unit levels.
- During the survey it was felt that the occupants of Lower Income Groups having 1-BHK unit, Middle income groups having 2-BHK unit, and Higher income groups having 3-BHK had experienced varied problems during their stay at home during COVID-19, therefore, innovative need-based design practices may be encouraged to achieve resilience in a spatial area during COVID-like situation.
- Resilience was seen in the designed and organised communities where the neighbourhood planning was also robust. Therefore, neighbourhood planning for all income levels, vis-a-vis Lower income groups having 1-BHK unit, Middle income group having 2-BHK unit, and Higher income groups having 3-BHK unit, may also be given more priority so that the availability of basic services becomes reachable during the pandemic as also mentioned in the literature reviewed. [Aldossary et al. \(2023\)](#)
- As discussed during the interviews conducted, the interviewers stated that there is a need for amendment in building by-laws, especially for the residential category of all income groups, may be amended where possibility of adaptable spaces may be given as recommendations. And the change in designs may offer proper sanitation, natural light, and cross-ventilation. The residential areas should be on top priority as that is a safe place to be during pandemic times.

6.2. COMMUNITY-LEVEL RECOMMENDATIONS

- Keeping the community's sensitive group vis-à-vis Low-income groups having 1-BHK unit and Middle-income group having 2-BHK unit in mind, the residents, architects, interior designers, industry leaders, and furniture manufacturers may be given the innovative need-based design practices

having newer approach in spaces, as also mentioned in the literature reviewed [Alhadedy & Gabr \(2022\)](#).

- Considering the interdisciplinary approach to inculcate healthcare, architecture, and interior design education and awareness programs, sensitization of students towards the change and to enhance their technical capacities towards the importance of health in designs may be done through education. A convertible living may be required during health emergencies/quarantine period in the form of isolation spaces may also be taught through design schools. [Valizadeh et al. \(2022\)](#), [Alhadedy & Gabr \(2022\)](#)
- In one of the literatures reviewed and the survey conducted, affordable and changeable prototypes in furniture can be formulated so that all economic categories may use it regularly or during emergencies as mentioned in the literature [Alhadedy & Gabr \(2022\)](#).
- During the survey conducted people have mentioned the importance of natural and ventilation in the times of lockdown. Natural light, cross ventilation, and recreational spaces are to be encouraged to balance the internal environment and reduce mental stress. This may improve mental health as well, as mentioned in the literature [Alhadedy & Gabr \(2022\)](#). Therefore, provision of the mentioned design aspects may be provided in the byelaws.

6.3. DESIGN-LEVEL RECOMMENDATIONS

Figure 4



Figure 4 Showing Flexibility, Adaptability, and Convertible in a Spatial Arrangement
Source www.designcafe.com

- Re-modelling of the design of housing projects and inclusion of all necessities like open areas, recreational areas, and convenient shopping may be strengthened at the design/policy level as discussed in one of the pieces of literature [Munnoli et al. \(2022\)](#)
- Interior habitable spaces with the prospect of converting from a family lounge to an office area with complete sanitation provisions, natural light, and cross-ventilation to be promoted through design competitions, as shown in [Figure 4 & Figure 5, Zaher \(2020\)](#).
- During the interviews with the architects, designers and planners in the society, sample drawings for varied sizes may be created to which the impanelled planners, architects, & designers may easily be referred [Alhadedy & Gabr \(2022\)](#).
- Need-based designs, social priority designs, cost-effective design techniques may be introduced in the design manuals to implement them in the designs [Zaher \(2020\)](#), [Alhadedy & Gabr \(2022\)](#)
- The designs may be prepared with a vision of resilience to achieve a better quality of life and it should be focused on adaptability during health emergencies. [Aldossary et al. \(2023\)](#), [Alhadedy & Gabr \(2022\)](#).

The room size in [Figure 5](#) shown below is 14'-0" x 12'-0" which may act as a module for experimentation having 02 adults and 02 kids. The module may be considered for Relaxing-cum- sleeping during the evening to early morning (6 pm-7 am), working during the morning to evening (9 am-6 pm), and a recreational/play area with family/kids during the evening (6 pm-9 pm)

Figure 5

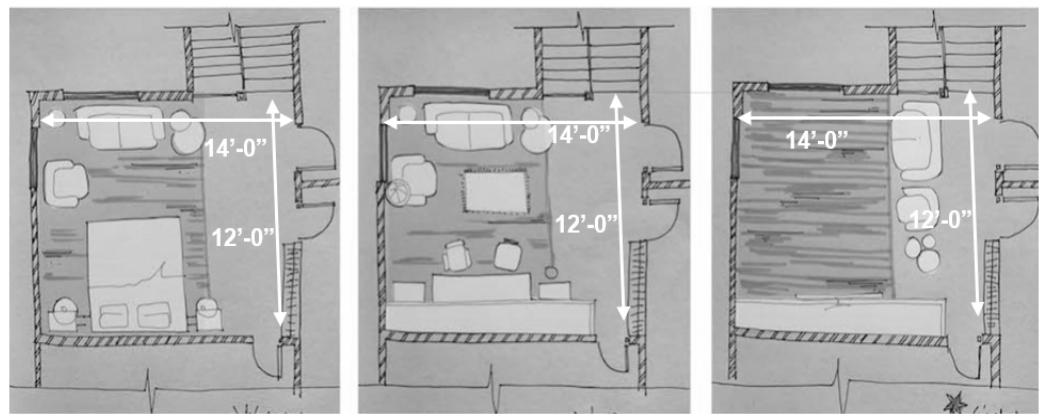


Figure 5 A Dwelling Unit Showing a Convertible Spatial Layout During the Day

Source Author

CONFLICT OF INTERESTS

None.

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