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Article

Sustaining Healthy Staying Communities in University Residential Halls amid Unprecedented Pandemic

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Abstract: Because of the COVID-19 pandemic, most teaching and learning or student services in the higher education setting have moved to the digital world. However, university residential halls have continued to provide services as there are students who are unable to go back to their homes/countries because of travel bans or family reasons. This study investigates the perceptions of residents who stayed at university residential halls during the pandemic. In-depth interviews were conducted with 77 staying residents from four public universities in Hong Kong. Through the sharing of their residential experience, it was found that these stayers were impacted greatly by the changes in the residential hall environment, particularly in terms of reduced interaction and emerging disciplinary concerns. Results reveal that stayers had undergone different negative mental states, namely stress, paranoia, loneliness and boredom. After identifying their conditions, some sustainable residential practices were proposed, such as maintaining minimum face-to-face contact for stayers, practicing transparent communication and arranging bulk purchases of living supplies. It is hoped that the results of this study can help to inform readers regarding the possible impacts on the stayers during a partial lockdown environment in university residential halls and how they can be better supported by universities.

Keywords: university residential community; COVID-19 pandemic; emotional needs; sustainable practices



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1. Introduction

On 11 March 2020, the novel coronavirus disease 2019 was designated a global pandemic by the World Health Organization. In response to the threat, leaders worldwide have implemented measures to control the spread of the virus. Nevertheless, the coronavirus disease continues to pose huge public health and societal challenges to date (May 2021). In order to ensure the safety of all related parties, institutions have taken varieties of measures. For example, institutions of higher education shuttered campuses and announced mandates to adapt online teaching to protect the health and safety of different stakeholders when the pandemic emerged. Following social distancing guidelines, study abroad programs, university events, sports and face-to-face gathering were either prohibited or restricted in size to limit contact of individuals outside of their household [1–3].

The outbreak of the coronavirus has dramatically affected the education field around the world. Due to the concerns of the spread of infection and cost containment, face-to-face meetings are restricted for universities worldwide and substituted with online meeting occasions [4]. While the teaching environment has welcomed a swift and effective shift

to the digital world [5], the university residential environment, on the other hand, has received significantly less assistance from modern-day technologies.

The notion of sustainability carries the temporality of both present and future; a sustainable projection should also offer future vision that does not have the present satisfaction decline overtime and should be applicable in the future [6]. Given that there are changes to the environment, sustainability shall be taken into consideration, which requires the adaptation to be effective in the future, as well. Due to the pandemic, institutions have implemented a variety of preventive measures to combat the virus, and therefore a lot of unprecedented changes have emerged within a short period of time. Under this specific context, we can see the essence of shaping sustainable residential communities lies in consistently providing an educational environment, both now and in the future. However, many of the changes have often been regarded as “temporary” [7] and as such, the general public carries the impression that these changes will gradually fade away without the need to intervene. As result, responses and reflections with long term projections are not considered to be essential and critical. If similar events re-emerge in the future, the corresponding cultivation would unavoidably become unavailable by then, patently violating the principle of sustainability. In other words, in the hopes of shaping a sustainable residential environment, the observed changes should not be merely viewed as temporary events. Instead, to account for a better vision, the current situation should be examined carefully, for this is the underlying motivation behind this study.

In light of the COVID-19 situation, this study first focuses on analyzing the pandemic’s impact on university residential hall environments and how the staying residential communities have responded to this issue, followed by proposing sustainable residential practices that could tailor to their needs. In particular, this study pursues two research goals: (1) investigating the staying residential community during the pandemic and (2) identifying effective measures to sustain healthy staying communities under the new normal.

2. Study Context

Under British colonialism (1842–1997), the education policy in Hong Kong was greatly impacted. Borrowing from the Oxbridge university residential model (the combination of the University of Oxford and the University of Cambridge) [8], the first university in Hong Kong was established in 1911, and started as a residential-based university [9]. According to Anderson [10] (p. 22), the Oxbridge Model had “an almost universal assumption that universities should be communities”, and social interaction of residential life was as essential as formal classroom instruction. Therefore, residential halls in Hong Kong were also perceived as part of the learning curriculum at that time, and “no-one in the University doubted the value of compulsory residence . . . ” [9] (p. 193).

After more than a century, university residential halls still exist to promote student well-being and development [11,12]. Among the eight public universities in Hong Kong (the Hong Kong government funds around 60% of the recurrent income of local public universities), all of them include university residential halls for both local/international undergraduate/postgraduate students to reside. However, given that the number of enrolled students has escalated from around 75,400 (2011/2012) to 101,480 (2019/2020) [13], currently, public universities in Hong Kong can only accommodate one-third of their enrolled students [14]. In light of this, many public universities in Hong Kong provide guaranteed hall residency for students for at least one or two semesters [11], as they find residential experience important for promoting students’ growth and development. In addition, the Hong Kong government has made a new initiative in their policy address to allocate more funding to support the development of residential halls [15]. This has reflected that the importance of residential halls is being acknowledged by the government, and is promoted among the government subsidized public universities in Hong Kong.

Since the pandemic posed great challenges to the world, this study analyzes its specific impact on university residential halls. Having noticed that not all private universities in Hong Kong have residential halls, and it seems the values of residential community are

less emphasized in their setting, only public universities were targeted. Out of the eight public universities in Hong Kong, half of them were recruited successfully in this study.

3. Literature Review

Regarding the setting of the university residential environment, there were close interactions among students [16], and as such, student residents could be identified as networks coined as hall communities. According to Cheng and Chan [11], residential halls provide a good platform where students from different social and academic backgrounds are able to form relationships and jointly build a community. According to previous studies, these hall communities play a crucial role in establishing opportunities for students to be involved in campus-related and off-campus activities [17], and are effective in enhancing the overall satisfaction towards their higher education experiences [18]. In a setting that heavily relies on student residents to socialize and interact to form bonding and create a sense of belonging, the pandemic seems to have a major impact on hall communities. Due to policies such as social distancing, usual social activities have been prohibited in residential halls and stayers are required to quarantine in their own room. Hence, the communities have been encountering difficulties to create strong supportive bonding among them [4].

This is a worrying situation, as Brooks et al. [19], who conducted a review of the psychological impacts of quarantine, found most reviewed studies reported negative psychological effects including post-traumatic stress, confusion and anger, with stressors including infection fear, frustration, boredom, inadequate supplies/information and the long quarantine duration. Although the connection between staying residents and the outside world persists through social media, another study found that adolescents who spend more time on social media or connecting to friends virtually during the pandemic face heightened depression and loneliness [20], and therefore their study concluded that physical interaction is irreplaceable. These studies suggest that even though the staying residents can be socially connected in the virtual world, physical isolation would eventually result in different negative emotional impacts. Pfefferbaum and North [21] believe that such psychological impacts may possibly translate into a range of emotional reactions (e.g., distress and unstable mental conditions), unhealthy behaviors (e.g., use of excessive substance) and noncompliance with public health directives. To prevent stayers suffering from adverse emotion under the current pandemic, it is necessary to examine how they are coping with the situation.

In order to maintain consistency throughout the article, the term “stayers” represents the staying residents and “leavers” refers to those who left the residential hall during the pandemic. Based on this distinguishment, the community formed by “stayers” is coined as the staying community. The rationales for staying in university residential halls under the pandemic can be very different, for instance, local students might find the hall a safer and more preferable living place than their home and exchange students might be unable to fly back home due to travel restrictions [22], etc. Although many students may choose to leave, some become the staying residents and experience a different residential community under the pandemic.

Compared the stress and anxiety levels among university students in France during pandemic, a recent study identifies that those who confined alone at the original campus residency instead of relocating with their parents were disproportionately affected [23], as these students experienced increase anxiety and moderate to severe stress during confinement. Many previous studies examined how different groups of people cope with the pandemic and quarantine, such as general university students [24], eating disorder patients [25,26], and older adults [27]. The researchers of this study believe stayers also belong to the emotionally “vulnerable” group described by Pfefferbaum and North [21] (p. 510), as they were living in congregate settings, isolated without caretakers, coping with unfamiliar public health measures, processing conflicting messages from authorities/media and facing different uncertainties associated with the pandemic on their own.

The staying communities encounter lots of changes under the pandemic. At first, many universities required student residents to return home unless they applied for a waiver indicating their special needs to stay on campus [28], or only open 60–85% capacity of the residential hall, with most students in double rooms, as single rooms were reserved for high-risk students [29]. Although different residential halls may have various precautionary measures, the underlying directions are comparable: reducing the number of residents and maintaining social distance among stayers. In accordance with how the epidemic situation unfolded, some universities gradually allowed students to return to residential halls. Mitigation practices were taken such as scheduling move-in across a one-week period, residents were required to wear masks in all indoors common spaces, retaining physical distancing and obeying restrictions on group gatherings [28]. The adopted practices and policies would undoubtedly affect the university residential settings and the staying community. The main focus of this study is not to investigate what measures have been taken in different residential halls, but rather to examine the residential experiences of the staying communities during the pandemic, specifically how they were physically, socially and emotionally impacted. By developing such an understanding, the researchers anticipate the emergence of proper principles of sustaining healthy staying communities amid a pandemic and thus shed light on the optimal approaches to any comparable circumstances in the future.

4. Methodology

Although past study has identified struggles that residents encountered in residential halls [30], amid the pandemic, new challenges have emerged and the researchers of this study see the importance of investigating how stayers are coping with the new situation. In light of this, qualitative data were collected through focus groups and individual interviews to get an in-depth understanding of the residential experiences of the stayers. Focus groups were conducted to let interviewees exchange viewpoints and let the researchers gain multiple perspectives. Considering that some students may perceive mental states/emotional needs as personal and sensitive topics, individual interviews were conducted with those who feel uncomfortable sharing in a group. This study is part of a funded project examining the education value of university residential halls. While this project involves the collaboration of four public universities in Hong Kong, participants were recruited from different residential halls among the four universities.

4.1. Procedure

Both the focus group (4–6 people) and individual interviews adopted the same screening questions: (1) did you stay in the hall during the pandemic outbreak? (2) what is the reason you choose to stay in the hall? If the interviewee had stayed in the hall during the period, follow-up questions were posed: (3) would you share with us how the pandemic outbreak drew impacts on your hall life? (4) how do you feel about the impacts? (5) have you found some hall-life issues during this period? This set of primary questions served to develop the probing process. Then, secondary questions were asked by the interviewers after paraphrasing the significant points from the interviewees' responses to the primary questions; this process continued until the interviewees had no further response. Since this study is only part of a larger project regarding residential education and university educational aims, after this section, other interview questions were asked and reserved for future studies.

The interviews were conducted by nine researchers, to maintain consistency, an interview protocol was prepared. In general, focus group meetings lasted approximately 1 hour while individual meetings lasted for about 30 minutes. As there were both local and international stayers, the interviews were conducted in interviewees' preferred languages (Cantonese, English or Mandarin). The semi-structured interviews were audio-recorded, then transcribed and translated into text files (around 5 transcribed pages for group and 3 transcribed pages for individual) and coded by two reviewers.

4.2. Participants

A total of 156 participants were recruited and 77 of them (45 females and 32 males) stayed in the residential hall during the 2020/2021 academic year. The sample population is a mix of postgraduates and undergraduates (from year 1 to year 5) and international and local students (Table 1), studying education (15), arts (12), engineering (9), science (8), social sciences (8), business (6), law (4), medicine (3), communication (2), etc.

Table 1. Demographics of the stayers (n = 77) across the four universities (PG and UG refer to postgraduate and undergraduate respectively).

	Stayers (Recruited Interviewees)	Student Status	Levels of Study (PG/UG)	Local/International
City University of Hong Kong (CityU)	23 (42)	All full-time	2 PGs 21 UGs	3 local 20 international
Hong Kong Baptist University (HKBU)	1 (35)	All full-time	1 UG	1 local
The Education University of Hong Kong (EdUHK)	27 (40)	All full-time	2 PGs 25 UGs	11 local 16 international
The University of Hong Kong (HKU)	26 (39)	All full-time	8 PGs 18 UGs	16 local 10 international

4.3. Analysis

Inductive content analysis was conducted as the pandemic is an unfamiliar event, and previous studies were fragmented. During the data coding process, concepts with similar ideas were grouped together to form main categories, generic categories and sub-categories [31], the coding process was completed when no new categories were identified. To enhance coding reliability, a description of the categories (Table 2) was created by the first coder. Based on the coding description, the second coder reviewed and coded the received segments separately. With reference to the requirement proposed by Miles and Huberman [32], which suggests an 80% agreement between coders of 95% of the codes is sufficient, this study provides a high level of agreement across the two reviewers, with an indication of 93.7%. Taking a semantic focus [33], the researchers coded and reported only on explicitly stated ideas, experiences, meanings and concepts from the transcripts to prevent misinterpretation.

Table 2. Description of coded variables.

Main Categories	Definition	Generic Categories	Definition	Sub Categories	Definition
Impact on hall environment	Perception towards the changes in hall environment due to the pandemic	Less interaction	Reduction in occurrences of communicating and bonding with others	Fewer hall events	Cancellation or postponement of hall events
		Emerging disciplinary concerns	Reports regarding violation of hall regulations	Fewer residents in hall environment	Leaving or withdrawal from hall residence
Negative Impacts on stayers' mental state	Changes of the state of mind among stayers during the pandemic	Stressful	Under high pressure to cope with changes brought by the pandemic		
		Paranoid	Feeling overwhelmed by the risk of getting infected		
Expectation on third parties	Actions expected to be taken by groups other than stayers under the pandemic	Loneliness	Feeling socially or emotionally isolated, and being distanced from others		
		Boredom	Lacking incitement due to insufficient of hall activities variation		
		Others	Negative emotions that are not specific enough to be categorized in the generic groups		
Expectation on third parties	Actions expected to be taken by groups other than stayers under the pandemic	Maintain safety of hall environment	Implementing virus preventive measures to ensure the safety of stayers		
		Establish transparent communication	Facilitating efficient and clear conversation between stayers and third parties		

5. Results

The analysis revealed 111 open codes based on the 77 staying residents. The majority of codes were of how the pandemic impacted their residential hall environment (57%), followed by stayers' expectations of third parties (25%) and stayers' responses of negative emotion under the pandemic (18%). In Figure 1, the numbers in brackets refer to the number of open codes under the specific main categories, generic categories and subcategories.

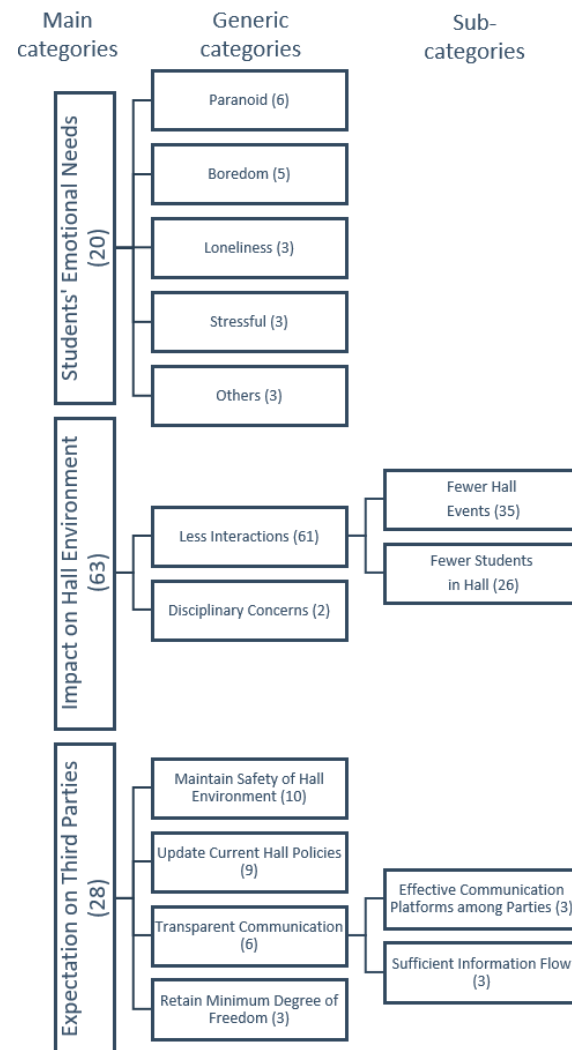


Figure 1. An overview of the main categories, generic categories and subcategories.

5.1. Negative Impacts Pandemic Has on Stayers' Mental State

The researchers of this study explored stayers' self-perception on how the pandemic has affected them by inquiring about their changes in mental state under the pandemic. Four categories of negative impacts were identified, accounting for twenty open codes, including "Stressful", "Paranoid", "Loneliness" and "Boredom". While the four categories together have inscribed seventeen codes, the three remaining codes are not clear enough for categorization and thus belong to another generic category of "Other".

5.1.1. Paranoid

While the four identified generic categories share comparable amounts of codes, the category of *paranoid* has the highest number of codes among them. The researchers identified responses that explicitly see the virus as a threatening uncertainty. A year 1 international undergraduate (UG) at EdUHK (E30) shared: "There was one time I was cooking in the pantry, another student whom I was not very familiar with was coughing,

maybe she caught a cold but I was very scared, so I went back to my room immediately". This is not a sole incident, as a similar experience was shared by another year 1 international UG at CityU: "One of my friends caught measles last month and everyone was so paranoid even though it is not pandemic. Even she healed, everyone is super afraid of her and super paranoid as they clean everything with bleach and she has to quarantine herself in another room". It has also been addressed that there is the phenomenon of stayers overreacting or underacting to the situation due to insufficient understanding of the virus, leading to a paranoid mental state for the stayers. Below is an exemplary quote illustrating stayers' feeling of paranoia amid the pandemic.

"For the virus, I think most of us are scared at first as we don't know what to expect. We are anxious about getting infected but [we could be] overreacting, so at the moment I would say it's very uncertain" (year 2 international postgraduate (PG) at HKU).

5.1.2. Boredom

Boredom is the category with the second highest counts of codes. Stayers expressed their opinions that the variation of activities they could enjoy significantly decreased in residential halls because of virus preventive concerns. "It became pretty monotonous because you can only stay in your hall room and if you go outside it can be dangerous" (year 2 international UG at CityU). Another year 3 international UG at CityU expressed that "most hall activities were cancelled and there are not many people living in hall, so life is very boring". It was noted that the dullness indirectly induced by the pandemic had a negative impact on stayers' mental state. The following is an exemplary quote related to the impacts of restriction: "I seldom go out. Sometimes, changes in the environment also affects your social mood because basically you have to stay in and walk in the same place that might make you feel a bit bored, a bit sad" (year 5 international PG at EdUHK).

5.1.3. Loneliness

While the researchers further explore how this change has impacted stayers' mental state, it was observed that the increased distance has led to the feeling of isolation, and therefore, there are responses from stayers perceiving themselves to be lonely in the environment. A year 4 international UG at EdUHK shared:

"My hall life in this year is pretty different with those in previous years . . . I had two roommates they all went home for the Chinese New Year and didn't come back. So, I've been living alone for more than three months. It's hard to live alone because it feels so lonely and isolated".

The following quote also demonstrates how distanced relations as a factor led to the perception of *loneliness*: "...as most of them [residents] did not come to HK after the class suspension notice, so it is very silent here [in the hall], I am feeling alone because of the pandemic" (year 3 local UG at HKBU).

5.1.4. Stressful

Under the unstable and rigorous changes during COVID, stayers are required to make swift and on-point adaptations that exert a lot of pressure. The pressure of adaptation is classified into two terms, academic and lifestyle.

As most lessons have moved to the digital world, stayers have to adapt to the new mode of teaching so as to maintain their comprehensive ability on the material and academic performance. As illustrated by the sharing from a year 2 international UG at CityU, "we faced a lot of study pressure since we could not mingle up [at hall] and do something to release stress". In addition, stayers' lifestyle was severely affected by virus preventive constraints and therefore they have faced a lot of pressure due to the need for adaptation. The following quote from a year 5 international PG is an illustrative example: "There are not many shops around hall, and the cafeterias on campus were not opening. Not wanting to catch the virus, I rarely go out and sometimes there was shortage in food . . . I remember staying in the Welcome [supermarket] for one hour and a half just to buy three oranges.

Right now, people line up for so long just to buy necessities, it makes me a bit stressed and worried.”

5.2. How the Pandemic Impacted the Residential Hall Environment

Due to the ongoing pandemic, governments worldwide have announced different virus prevention policies such as social distancing and restriction of social events, which have extended impacts on the higher education setting, especially in terms of the residential hall environment. Through this study, it was identified that the pandemic brought significant changes to the residential hall environment, especially in terms of interaction and discipline.

5.2.1. Less Interaction

Less interaction is the most repeated generic category across the study. The residential hall environment allows student residents to interact with one another on different occasions and there are distinctive layers of interaction in the setting (e.g., roommates/floormates/hallmates). As we inquire stayers' perception on the impact the pandemic has on the hall environment, 64% of interviewees indicate that there is much *less interaction* than before, which can be reflected by *fewer students in hall* and *fewer hall events*.

The responses indicated a significant decrease in numbers of student residents staying in the residential hall environment due to multiple factors. Some students value on-campus accommodation because of the easy access to face-to-face interaction, while the adaptation of having online classes has in turn lowered their motivation to stay in the residential hall. Shared by a year 3 international UG at EdUHK, “many students have foreseen that there would not be any face-to-face classes in this semester, so they have quitted the hall”. In addition, a year 2 international UG at CityU stressed that his Indian parents were quite concerned about the safety in Hong Kong and he was pressured to go back to his home country, like many other international students. The residential halls had also suggested residents go back home at that time, as illustrated by a year 1 international PG at HKU: “...the hall also advocate[s] people or students and residents to not stay at hall during this critical period because it is also considered a public place and everything is shared with others so it will increase the chance of virus transmission and just for public health and personal health.” (H2)

These joint effects have motivated residents to leave and directly led to a decrease in residents in the hall environment. With fewer students in residential halls, stayers gained more personal space. A year 3 local UG at CityU shared that “because of the pandemic, I have no roommate, so I can live alone in double room”. Another year 2 local PG at HKU stated that “most of the floormates are not here, it saves my waiting time for pantry or bathrooms and I can have a more peaceful time”. While several may enjoy such a living environment, many are not used to the atmosphere and not having much social interaction.

“I think the most important part of hall life is definitely social interaction with peers. But during the pandemic, many people are not staying in halls and hall activities are all suspended. The atmosphere in the hall is unusual, just like a building with no people” said a year 3 local UG at HKU. A year 4 local UG at HKU stated that “hall activities require residents to run, even there is activity, there were not many residents left to join. I would say it's quite meaningless to live in a hall without social interaction”. An example illustrating the difference before and during the pandemic regarding social interaction in the residential hall is provided below:

“I would say we have very less social interaction. Compar[ed] to last year, we used to have a lot of [hall] events such as cultural nights and also hang around with friends and exchange students but now we are confined to our rooms” (year 3 local UG at CityU).

It is worth mentioning that the decrease in resident numbers is not exclusive for either local or non-local students as we have received responses claiming that the size of social circles decreased significantly for both groups of students. The following exemplary quote is delivered by a year 2 international UG at CityU stayer: “We are really used to having

a very vibrant and a very energetic hall environment but these days people are staying confined to their homes. It's very quiet here and most of them have already left to go back home. Locals [are] staying at home and non-locals are also not coming [to Hong Kong]."

Fewer hall events also significantly contribute to the phenomenon of having *less interaction* in residential halls. The researchers of this study received feedback from stayers claiming that having fewer organized hall events results in fewer occasions for student residents to bond with one another. Illustrated by a year 4 international UG at HKU, "a lot of hall activities which establish bonding among hallmates and floormates have been cancelled . . . as these activities are not taking place, we do not have the chances to interact with one another". This was also emphasized by a year 1 international UG at HKU, who said that "all hall activities which were supposed to take place were cancelled, I didn't get what I was expecting from residential halls. There is no support from hall. What we can do is to make informal and free ones like hiking". It has come to the researchers' attention that the lack of hall orientation events at the beginning of the semester created an impactful bonding barrier.

"Almost 60 to 70% of things were cancelled due to the pandemic and people are socially distancing. Usually what happens is that you come to hall in September and get to know people in the first few months and then you start to interact more (with your social circle). But when this phase came for me, I was not able to create a stronger bond with hallmates because of the pandemic" (year 1 international UG at CityU).

If we follow the perspective of seeing college residential halls as a network that connects student residents with different backgrounds, we can see that bonding has become significantly weaker because of the pandemic and has fundamentally changed the residential experiences for the stayers.

Fewer students in hall and *fewer hall events* have led to the impact of *less interaction* taking place in the residential hall environment. It was noted that there are both internal and external reasons that contribute to such phenomena. While external reasons refer to the objective conditions that drive the event to occur, internal reasons, on the other hand, refer to students' individualistic consideration.

The data reveal that external reasons are correlated to the swift changes in residential hall policies/practices, as stated by a year 2 local UG at HKU: "There are regulations on limiting the number of people and social distance. High table dinner, or any hall events which would gather people, have to be cancelled. There is no solution, we have to let the virus end before we could resume the activity and rebuild the bonding between residents". In addition, many residential halls denied visitor entry to protect the stayers, yet not everyone appreciates the new regulation, as stated by a year 5 local UG at HKU: "I was able to sign my friends in for visit. This is my final year, so I want to invite my friend to come over or they invite me to their hall to cook sometimes. But none of us can admit any visitors to our halls and this had a serious impact on me".

Internal reasons refer to students' considerations to reduce interaction in halls. As expressed by a year 2 local UG at EdUHK: "Some of my hallmates went back to the mainland China and then came back to the hall. As I am worried that they catch the virus, [so] I prevent to meet them, only staying in my room and have no face-to-face [interactions]". Apart from the concern of contracting the disease, students also understand the importance of reducing social contact. A year 4 local UG at EdUHK shared that "there is a lack of socialization in my hall life this year due to the pandemic and I just live in the hall by myself. However, I won't complain because it's for our safety. If it happened in another condition, a hall life without socialization would not be attractive to me".

5.2.2. Disciplinary Concerns

In comparison, far fewer interviewees delivered responses belonging to this generic category, indicating that it is not a general impact applicable to all stayers, but context-dependent by nature. Because the pandemic discourages people from going out, putatively, stayers encounter difficulty accessing consumables. As a result, some may choose to slip

food from others. In addition, crime-committing residents may consider their chance of getting caught to be lower due to the fact that there are less people in hall. The following quote better illustrates this category: “We have a shared kitchen with two floors, my food is always stolen from the fridge, my things always get stolen no matter what type of food like cooked food or uncooked food.[...] It happens all the time but the situation has worsened since the epidemic.” (year 2 local UG at HKU)

5.3. Expectation on Third Parties

In the previous two sections, the negative impacts on stayers’ mental states and the major impacts during the pandemic has on the residential hall environment are identified and outlined. To provide a more sustainable and healthier residential environment for stayers, this section further explores stayers’ expectations of parties other than students (e.g., hall administrative staffs and policy makers). In this analysis, interviewees’ positive feedback towards any specificity related to third parties are classified as expectation. A total of 27 open codes belong to this main category and three generic categories of expectations were identified, namely (1) *maintain safety of hall environment*, (2) *update existing hall policies* and (3) *establish transparent communication*.

5.3.1. Maintain Safety of Hall Environment

Residential hall environments by nature are exposed to the risk of virus outbreak since it inevitably consists of a large proportion of public areas, as stated by a year 3 local UG at EdUHK: “I am pretty conscious about the hygiene at hall now because we are using shared bathrooms and toilets. Whenever I go to toilet, I will bring some alcohol wipes. Also, I now avoid cooking at rush hours because there are lots of people who don’t wear masks when they cook in the pantry”.

Therefore, it is important to maintain the hygiene level of the residential hall environment to prevent virus outbreak. This claim is supported by the majority of stayers, as 44% of the responses on expectations of third parties emphasized the importance of maintaining the safety of the environment. In particular, stayers expect there to be an implementation of virus prevention measures and distribution of hygienic material. The following exemplary quote illustrates the general expectation stayers have regarding this particular theme of maintaining safety of the environment.

“...the hall took certain preventive measures such as the regular sterilization of lift buttons and public areas like common rooms and door handles, as well as voluntary temperature checks at the entrances of the residence. Moreover, they’re also providing one free mask every day to all the residents in the hall which is a very good measure on their side in order to prevent this virus” (year 2 international UG at CityU).

Moreover, it is worth noting that a year 4 local UG at HKU explicitly advises that there should be talks delivered by third parties to ensure stayers have sufficient understanding of the optimal hygiene standards.

5.3.2. Update Existing Hall Policies

In view of the drastic change to the residential hall environment, stayers have raised concerns about the need for updating existing hall policies. In particular, two aspects of hall policies are expected to be reviewed and updated: (1) hall fee and (2) hall admission and readmission for the coming academic year. With the former aspect, there are comments addressing the hesitation of moving out of the hall due to financial reasons and urging the hall to relocate financial support, such as a residential hall fee refund and delaying the due date of paying hall fee. The following exemplary quote belongs to this aspect of demand: “I wish the university would give us a second chance to apply for a refund or remit our hall fees in the next semester” (year 3 international UG at EdUHK).

Regarding the latter aspect, there are institutions using the system of “hall points” to assign residential vacancy—a system of determining priorities based on residents’ degree of participation in hall activities. As many hall events were canceled due to the pandemic,

stayers have expressed their confusion and proposed that there should be a review of this policy and ensure the arrangement is fair to all.

“...relatively fewer activities were provided in semester 1 so that I could not earn any hall credits. I am so worried about it since the credit is extremely important for me to apply for the hall next year. So, earning hall credit is the biggest problem that I met” (year 4 local UG at EdUHK).

5.3.3. Establish Transparent Communication

Seeing the residential hall environment as a network that involves different stakeholders, the pandemic is a challenge that shall be faced and overcome with close and effective coordination among these parties. Therefore, to ensure that staying communities can respond to the crisis in an effective and efficient manner, it is important to establish clear and transparent communication among them and this putative claim is the major idea behind the category of *establish transparent communication*.

First, due to the pandemic, it is important for different stakeholders to communicate on varieties of issues such as identifying each other's needs and disclosing the rationales behind particular actions and changes. However, there are responses advocating that these communications are either insufficient or difficult to make effective as there are no clear and accessible platforms of communication for them. Below are two direct quotes reflecting the situations:

“...we need to send emails and feedback to the hall tutors and let the hall tutors give feedback to the department, which is quite time-consuming but I understand that staff have their own concern(s)” (year 5 international UG at EdUHK).

“I joined the social media group of our floor committee but no one talked. I didn't hear from my hall tutor either, though I still have the hall residence. There was only one email informing us that we can apply for the next year's hall residence but there was no instruction or guidance regarding how we should check out” (year 3 international UG at EdUHK).

In order to facilitate a well-rounded and efficient decision-making process, it is important to ensure that there is sufficient information flow, keeping the involved parties informed about the concrete whole pictures.

5.4. Local and Interational Students

Although stayers are experiencing significant negative impacts due to the unprecedented changes, it has also been observed that the majority of interviewees were able to buffer and find support from different networks. A closer look was taken to understand how local (31) and international (46) students made themselves feel better emotionally in residential halls under the pandemic (Table 3.)

In general, stayers (1) attempt to connect with their roommate, as they shared the same room and the physical proximity allows them to build a relationship easier amid the pandemic. While most interviewed local stayers no longer have roommates (their local roommate had returned back home), international students, on the other hand, tend to achieve this more easily. Furthermore, both local and international students (2) reach out to other stayers in their floor/hall to form a self-help small community. Given that students have their original social circle, they also (3) interact with friends online. It is worth noticing that the researchers found three international students who tended to (4) keep contact with leavers, while no local student did so. These students updated the current situation in Hong Kong to the leavers, as illustrated by the quote below:

“Some Mainland students who have not [been] back to hall will ask me how's things going on in Hong Kong... because in Mainland China, some have difficulty to access the latest updates in Hong Kong so I use my knowledge and my personal observation to assure them whether it is safe and how things are going on. That's how I can help them” (year 4 international PG at HKU).

Table 3. Exemplary quotes illustrating how local and international students gain support from different networks.

	Local Students	International Students
Attempting to connect with roommate	“Because there is no roommate and we have to keep the social distancing, I can’t really build relationship . . . ” (year 3 local UG at CityU)	“ . . . I have a roommate. In the past, we were not close since we have different life-style, social circle and enrolled program. So, basically, I was not connected with her. But now, I think it’s quite usual for me to go out with her or have lunch with her. I think this new relationship with my roommate is quite good.” (year 1 international UG at EdUHK)
Reaching out to other stayers	“I think around 1/3 or half of the local residents still stay here [in hall]. We kind of share our academic stress together and we hang around. Sometimes we cook together as we can’t get food outside. I feel like the bonding is quite strong that I am happy living here.” (year 2 local UG at HKU)	“Recently in our floor, we group together and we shared a lot of food together which we [never did] before. Because I think a lot of people feel really lonely here right now and very isolated. It makes you want to do something for others.” (year 5 international PG at EdUHK)
Contacting existing friend circle	“If I’m bored, I would call my friends to discuss random things or discuss what we are doing.” (year 3 local UG at EdUHK)	“I’ll try to get in touch with my friends. We have random Zoom meetings throughout the semester. If there is someone’s birthday, usually we would celebrate at hall. We did a Zoom call, games night. We did try to overcome it a little bit but because everyone is around the world and there are time difference, so it’s a bit difficult.” (year 4 international UG at HKU)

6. Discussion

In this study, the researchers examined the impacts the COVID-19 pandemic has had on residential hall environments. One major impact of the pandemic is that there is significantly *less interaction*. In addition to the identified impacts, the issue of how these changes in the environment have negatively affected stayers’ mental state was further explored. As these negative impacts represent stayers’ needs in the hall environment, the researchers believe a more in-depth discussion of these needs is the key to prospering sustainable, healthy residential hall communities under the unprecedented crisis of the pandemic. Since the notion of sustainability implies that before we could project a lasting satisfaction in the future, the present situation and effectiveness must first be secured and maintained.

6.1. Tackling the Sense of Loneliness and Boredom

In this study, it was observed that stayers expect the residential hall management team to promptly ensure the safety of the residential environment, such as by implementing social distancing measures. Such expectations resulted in having *less interaction among stayers* and further lead to the feelings of *loneliness* and *boredom*. Such conflicts became a cycle of resentment stayers have towards the authorities. The phenomenon is consistent with Banerjess and Rai’s study [34], as they affirmed that social restriction during the pandemic brings *loneliness* and *boredom* to people, and suggested that these two concepts can lead to anger and frustration towards the authorities. In light of this, the researchers propose that extra attention should be paid to ensure this loop is not jeopardizing the overall well-being of the staying community.

This study identified both internal and external attributions that resulted in *less interaction* among stayers in the hall environment. This particular change has brought negative impacts to stayers' mental state, especially in terms of *loneliness* and *boredom*. While some students are intrinsically motivated to comply with the social restriction measures, some are reluctant. This finding aligns with a recent review study [35], which confirms that the degree of adherence to disease prevention measures varies among people based on their knowledge about the disease, perceived risk of the disease, social norms, etc. In order to keep the stayers on the same page, Webster et al. [35] suggested that it is crucial to make the public health benefits of social restriction clear, as well as promoting the knowledge about social restriction protocol. Since a previous study on virtual social events found that solely relying on online connections still has negative effects on adolescents' mental states [20], after weighting out all the costs and benefits, the researchers of this study believe it is necessary to have a minimum face-to-face but "touchless interaction" [36] (p. 51) for stayers. To facilitate stronger bonding within the staying community, the following concrete approaches could be considered:

- Re-open closed common areas and allow controlled usage;
- Provide guidelines and resource support for face-to-face meeting under safety restriction policies;
- Arrange varieties of social online events for stayers to interact more frequently.

6.2. Easing the State of Paranoia

In addition to the decline of social interaction in the residential hall environment, the unprecedented pandemic also negatively affects stayers' mental state. The outbreak itself has been perceived as an uncertain hazard that endangers stayers' safety. Worried about the risk of getting infected, the impact of *paranoia* emerges. The results show that this situation, in particular, is worsened when the stayers lack correct understanding of the threat or do not believe there are adequate virus preventive measures taken in the residential halls. While taking preventive measures is crucial in terms of securing the safety of the staying community, it can also be considered as an effective way to minimize the impact of *paranoia*.

Despite having various virus preventive measures implemented, *paranoia* might still persist due to the lack of *transparent communication*. The researchers of this study received responses reflecting that even after the execution of virus preventive measures, stayers nevertheless worry about their own safety if the taken measures are concealed to them. Previous channels of communication in residential halls [14], such as face-to-face meetings and placing notices/posters, have become less applicable and effective to facilitate *transparent communication*. Moreover, nowadays it is easy to receive misleading information about the virus [37], such as unverified information shared on social networks or rumors spreading through mobile messaging apps. To prevent staying communities from overreacting or underreacting to the event, third parties could focus on shaping the environment into one that exposes stayers to reliable information on the pandemic. In addition, an experiment found that emotional messages that invoke thoughts of infecting a large amount of people can motivate social distancing and minimize marginal behaviors (such as meeting friends for a while) [38]. Therefore, emphasizing the fact that residential halls are accommodating large groups of stayers is an effective way to raise awareness.

According to stayers' feedback, *transparent communication* should involve an accessible platform with a sufficient degree of information flow. Along with implementing powerful virus preventive measures, such as not allowing visitors to enter the hall area, distributing surgical facemasks to residents on a regular basis and sanitizing the hall areas every day, concrete suggestions regarding the promotion of *transparent communication* are raised as follows:

- Provide regular updates on implemented virus preventive measures through official social media pages of the residential hall (e.g., Facebook and Instagram);

- Provide online feedback channels (e.g., discussion forums, online consultation) to collect staying communities' opinions on virus prevention-related matters;
- Organize live-streaming pandemic-themed talks given by experts to specifically share how residents can prevent infection in residential halls.

6.3. Reducing the Feeling of Stress

Taylor et al. [39] have coined the term "COVID Stress", dedicated to the amount of distress felt by most people during the pandemic. Not surprisingly, stress is also one of the negative impacts found on residential hall stayers' mental state during the pandemic. Our study found that stayers were stressed about changes in academic (e.g., online teaching and learning) and living (e.g., running out of supplies) situations. To relieve the overwhelming pressure of adaptation, faculty and staff should also be involved to address the academic needs of the staying residents; for the stress of taking care of oneself, Bodas and Peleg stated that "providing people with assurances about their livelihood" [40] (p. 936) is necessary during the pandemic, and another study also mentioned the importance of ensuring the sufficient supplies of food, medication and other essentials to the public [35].

With reference to the interviewees, it has also been observed that some stayers are feeling stressful due to financial difficulties and housing uncertainty of the residential hall. As these concerns are often beyond stayers' ability to tackle, proper reviews and updates of the hall policies are essential to sustain healthy staying communities under the pandemic. Guidelines and suggestions could be provided to outline the available directions of adaptation for the stayers in advance. Having the options clearly laid out, it could be anticipated that stayers would be less *stressful* confronting changes. Short-term assistance could be offered in response to the hardship stayers might encounter during adaptation. Concrete suggestions to assist stayers' adaptation are listed as follows:

- Offer short-term arrangements on bulk purchases of living supplies;
- Invite academic staff to provide support to stayers, such as academic mentorship programs;
- Provide necessary financial support such as partial/total hall fee refunds and allow installment payments;
- Review hall admission and readmission policies and provide short-term accommodation support.

7. Conclusions

To ensure that the residential hall environment is a sustainable educational setting amid the COVID-19 pandemic, it is important to identify plausible approaches that could minimize the negative impacts affecting stayers. At the time of this writing, higher education institutions are still adjusting to the "new normal". By conducting in-depth interviews with the stayers, the impacts of the pandemic on the hall environment were scaffolded, as well as how these changes have affected stayers' emotional states. After consolidating the expectations of stayers, this study attempted to provide practical recommendations to sustain and support the stayers' community based on the data obtained via interviews at four universities in Hong Kong. Although the findings may not be applicable to all residential halls in the world, the study still provides a valuable point of reference to guide and inform stakeholders regarding how residents' mental needs should be addressed under the pandemic. At this stage, it is still unclear how these new residential experiences may affect stayers' development in the long run. In fact, considering the sample size of this study ($n = 77$), interviewees who are willing to give direct feedback describing their negative emotions are not the majority. As this intriguing phenomenon might be indicating the existence of a gap between stayers' perception of the situation and their own emotions, the complete picture is beyond the scope of this study. However, while the received counts of codes regarding emotions may not be adequate to formulate a universalized picture of stayers' experiences, they still serve as a valuable reference for us to understand stayers' psychological changes under the unprecedented event.

In order to understand stayers' first-hand perceptions of the situation, a qualitative method was used in this study as it offers great flexibility while perceiving stayers' opinions. The unique insights offered by a quantitative approach shall not be neglected, as well. It is plausible that factors such as mental health and connections between stayers can be measured and analyzed statistically. In addition, it was noted that the influence of the pandemic comes in multiple aspects and thus it is possible to approach the theme from other interdisciplinary angles in the future. For instance, it has been disclosed that stayers are showing negative mental symptoms, which could be investigated with proper psychology theories. In addition, the difference between local and non-local stayers could also be analyzed from the cultural perspective to identify the most beneficial way to facilitate solidarity among the stayers. In light of the addressed limitations and potential direction of exploration, this study invites future research to shed light on university residential communities, in the hopes of securing long-run sustainability.

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