



# **Change in Children behaviors, & Physical home setting under Covid19**

Presented to: Dr. Manal Abou El Ela and Dr. Heba Safey El Deen  
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Presented by: Mohamed Radwan

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## Abstract

As schools and children day care facilities remain closed to prevent the spread of the new coronavirus, parents everywhere are struggling to keep children healthy and occupied. Children extended stay at home with no possibility of outdoor activities, whether educational or play activity, resulted in reported change in their behaviors, and how they use space, according to primary studies by World Health Organization and UNICEF.

The focus of this study is to attempt to map this change both in the physical space and on the behavioral aspect, through a hybrid quantitative and qualitative approach. This was done through a questionnaire that was distributed to 59 participants, and structured in depth interviews with 8 respondents. The findings of the questionnaires was that the majority of the participants reported changes to their children's behaviors and play activity post pandemic confirming the initial findings of WHO organization, however, only 40% reported physical settings changes to correspond to these behavioral changes.



# Introduction

The coronavirus disease (COVID-19) pandemic has upended family life around the world. School closures, Working From Home, physical distancing, has affected the families world wide, but the effect is more acute on children who lack understanding of the situation. 99% of children and young people under 18 worldwide live under some form of movement restrictions due to COVID-19 lockdown. 60% of all children live with a full (7%) or partial (53%) lockdown (UNICEF, 2020). The dependence on child day care organizations has increased significantly in recent years and has been attributed to an increase in maternal participation in the workforce and the growing availability of pre-school facilities (Story, Kaphingst, and French 2006).

With the sudden closure of these educational establishments, and children spending all their times at home, with no or little access to outdoor areas, Children psychology and behavior is bound to get affected. In education, an entire generation of children have seen their education interrupted. Nationwide school closures have disrupted the education of more than 91% of students worldwide (UNICEF, 2020).

Social distancing, isolation from friends and loved ones (cousins, extended family members and grandparents), loss of school structure, disruption to education, needing to adjust to education at home, and concerns about the virus and its various impacts on their families may create feelings of worry, anger, frustration, sadness, uncertainty and loss for children (IACS, 2020). Children understand and discover the world around them primarily through play. Play activities are recognized to be important to the cognitive development of children (Moore & Wong, 1997; Frost et al., 2001; Blinkert, 2004). The limited access to outdoor, isolation and anxiety, results in decrease in active playing in favor of more sedentary and passive forms of play and entertainment (WHO, 2020).

Passive activities do not have the same benefits as active play for the overall development of children (Blinkert, 2004). Active play is important for the physical, social, emotional and cognitive development of children (Metin, 2003).

As children spend more time at home, they “experience an increase in stress and a reduction in support and coping resources” due to lack of personal and activity spaces at home (Clemens et al., p1; CSTS, 2020). Lang & Lang stated that disasters extended over long intervals of time, damage the ‘cohesive forces that hold a group together’ and put them under stress (Lang & Lang, 1964) denoted from (Edelstein M. & Wandersman A., 1987).

This could be due to the fact that as families are spending more time together at home, they experience less privacy and intrusions on individual territory from other family members. This is echoes Altman’s definition of crowding as “a situation that does not permit the optimal degree of privacy or social distancing between individuals in a social

environment" (Parke, p70). In other words, as families are social distancing from the outside world, they are eroding the social distance between themselves and sometimes intruding on each other's privacy.

Following the outbreak of Covid 19, UNESCO stated in April that in order to respond to the social and psychological anxiety and emotional confusion caused by COVID-19, families must build necessary lifestyle coping skills and emotional resilience (UNESCO, 2020).

## Statement of Purpose

**The research attempts to explore questions about the changes in children lifestyles and behaviors caused by the pandemic lock down, and whether these changes correspond to changes in the physical setting of the house environment. Or rather can changes to the physical setting of the house help alleviate and improve the anxiety and stress cause in children by the lockdown?**

Parke (1978) states that the home environment remains the principal setting in which the child's early social and cognitive development occur, and that naturally, the physical setting of the home, is often socially mediated by parents (p35). Therefore the number, type, and variety of inanimate stimulations that are available to the children are controlled by the parents, as well as the design, layout and color scheme of their rooms, and the amount of toys available (Parke, p43).

And since Parke established that the amount and characteristics of toys available to children significantly alter their social behavior and "affect social interaction in an indirect fashion, whereby an alteration in the physical environment impacts on the interactions between social partners" (Parke, p49). This was another key area of my study, to explore how the availability of toys affected children in the time of distress.

In her study of the effects of the home environment on the development of children, Laura Johnson found that young children usually like to play within visual range of their parents, and concluded that the introduction of a home play area is more likely to be in the home's central living areas or most used space. (Johnson, p146)



FIGURE 1: CHILDREN ACTIVITY POCKETS WITHIN THE LIVING SPACE (JOHNSON, p150)

Parke denoted Pastalan (1970) in stating that children have specific areas of territoriality inside their home environment which they consider and use as a sanctuary and safeguard those areas against intrusions (Parke, p65). In this sense Territoriality and privacy, are in Parke's view interconnected concepts, where territoriality helps children achieve privacy. This posed another research question, how are the privacy and territoriality of children affected by the increased proximity and exposure to the parents? How are children responding to these conditions of crowding in the home environment? And what measures are the parents taking to help them adapt to the new circumstances caused by the Covid19 pandemic lockdown?

## Methodology

The study follows a hybrid approach, between a qualitative study with a quantitative component.

The study was conducted through a questionnaire that was distributed to 59 participants, 45 of the respondents were from Egypt and 14 of respondents were from other countries. The questionnaire was followed by a semi structured in depth interviews with 8 respondents.

The questionnaire was divided into 3 sections:

- Section 1 for segmentation: dealing with size of family, type of home setting,
- Section 2 dealing with the changes physical setting of the home
- Section 3 dealing with the behavioral changes of the children

Based on the questionnaire, 8 respondents were chosen to conduct structured in depth interviews, of a more qualitative nature, to map out the behavioral changes of the children and the corresponding physical setting changes.

Before creating the questionnaire and distributing it, an online investigation was carried out, on various social media platforms, to validate the hypothesis that children behavioral changes due to the covid19 lockdown resulted in changes to the physical setting of the home.

Evidence was found to support that in several instances. UNICEF had created a YouTube video channel titled "Stay Home Diaries" with 7 videos of 7 children from different places in the world and of several ages. The videos documented the changes in lifestyles of the children pre and post lockdown, some of them also reflected changes to the physical settings of the house environments that the 7 children resided in.

In one instance, Joakim, a 5 years old child from Cape Town, documents his daily routine as he does his Capoeira sport training online via video conferencing, the living room shown in the is cleared and in center there is gym mat. In another video, Camila, a 5 years old girl from Cairo, tells viewers she now likes to have her breakfast in the balcony, have

yoga in her room, then help her mom in the kitchen, before heading to have her classes in the dining room, a daily routine that is obviously dictated by the lockdown.

On Facebook, Egyptian Mothers' groups offer more evidence on the subject. On June 1, O. E. posted a photo of her remodeled reception to the group "A Happy Mommy Place", a Facebook group with 66,500 members.

In the photo, she revealed she had removed the seating areas to introduce a play area for her children.

Immediately members of the group started responding favorably, many revealing they did the same, or wanted to.



FIGURE 2: O. E. RECEPTION PHOTO, POSTED TO A FACEBOOK GROUP DEDICATED FOR EGYPTIAN MOTHERS



FIGURE 3: LEFT H. A. POST TO FACEBOOK GROUP DATED 1 JUNE, RIGHT H. A. POST TO PERSONAL ACCOUNT DATED APRIL 6

On the same thread, H. A. also posted a photo of her reception area remodeled to include a play area. In a public post titled "Quarantine Days", dated April 6, on her personal account, H. A. revealed that she had done this remodeling of space in early April, less than a month into the lockdown.

# Results

## The Online Questionnaire

For the purpose of segmentation and easier analysis the online questionnaire was divided into 3 sections:

- Section 1 for segmentation: dealing with size of family, type of home setting,
- Section 2 dealing with the changes physical setting of the home
- Section 3 dealing with the behavioral changes of the children

Children age segmentation in section one, follows Altman's chronological stages of development: Infancy: children below 2 years old, Preschool stage: children between 2 to 7 years old, Middle childhood: children between 11 to 15 years old, and Adolescence: above 15 years old (Altman, p64).

The questionnaire was spread online through Facebook groups, whatsapp groups, and to the personal contacts of myself. 59 responses were received to the questionnaire, 45 respondents were from Egypt, with 44 from Greater Cairo region and one from Alexandria; 14 respondents were from outside Egypt, 6 were from Australia, 3 were from the United Kingdom, 2 were from the United States of America, 2 were from the United Arab Emirates, and one was from the Kingdom of Saudi Arabia.

The overall majority of the respondents (83%) were females accounting to 49 respondents, and only 10 respondents were males. Only 9 of the female respondents (21.5%) reported being full time mothers and not working at all.

45 of the respondents (72%) reported one of the parents completely staying or working from home (WFH), but out of those only 11 respondents (18.5%) reported that both parents are working from home, and 7 respondents (12%) reported absence of a second parent, leaving the WFH parent to care for the children.

Out of all those who participated in the questionnaire, only 19 respondents (32%) reported having a dedicated child nanny/helper.

As for the family type segmentation, 17 respondents (29%) reported having 1 child only, 30 respondents (51%) reported having 2 children, and 12 respondents (20%) reported having 3 or more children.

Following the age segmentation proposed by Altman, 2 respondents reported their children to be in Infancy stage (below 2 years), 13 reported their children to be in the Preschool Stage (2 - 7 years), 15 reported their children to be in the Middle childhood stage (7 - 11 years), and 12 reported their children to be in the Adolescence stage (11 - 15 years).

Only one respondent reported children to be above 15 years, and 16 respondents reported having children of mixed age groups.

Concerning the type of house setting, out of all respondents, the majority reported living in apartments, accounting for 38 respondents, 16 of those reported having access to outdoor gardens.

The remaining 21 respondents reported living in a variety of house settings, like town houses, detached villas and semidetached houses, and all of those except 1, reported having access to private gardens.

28 respondents (47.5%) reported that each child had their own room, 23 respondents (39%) reported that their children share one bedroom, 8 reported that their children share separate rooms based on Gender.

Out of the respondents who reported having private gardens 2 reported that their children never use the garden. And out of the respondents who reported having access to public gardens 17 reported that their children never use the garden.

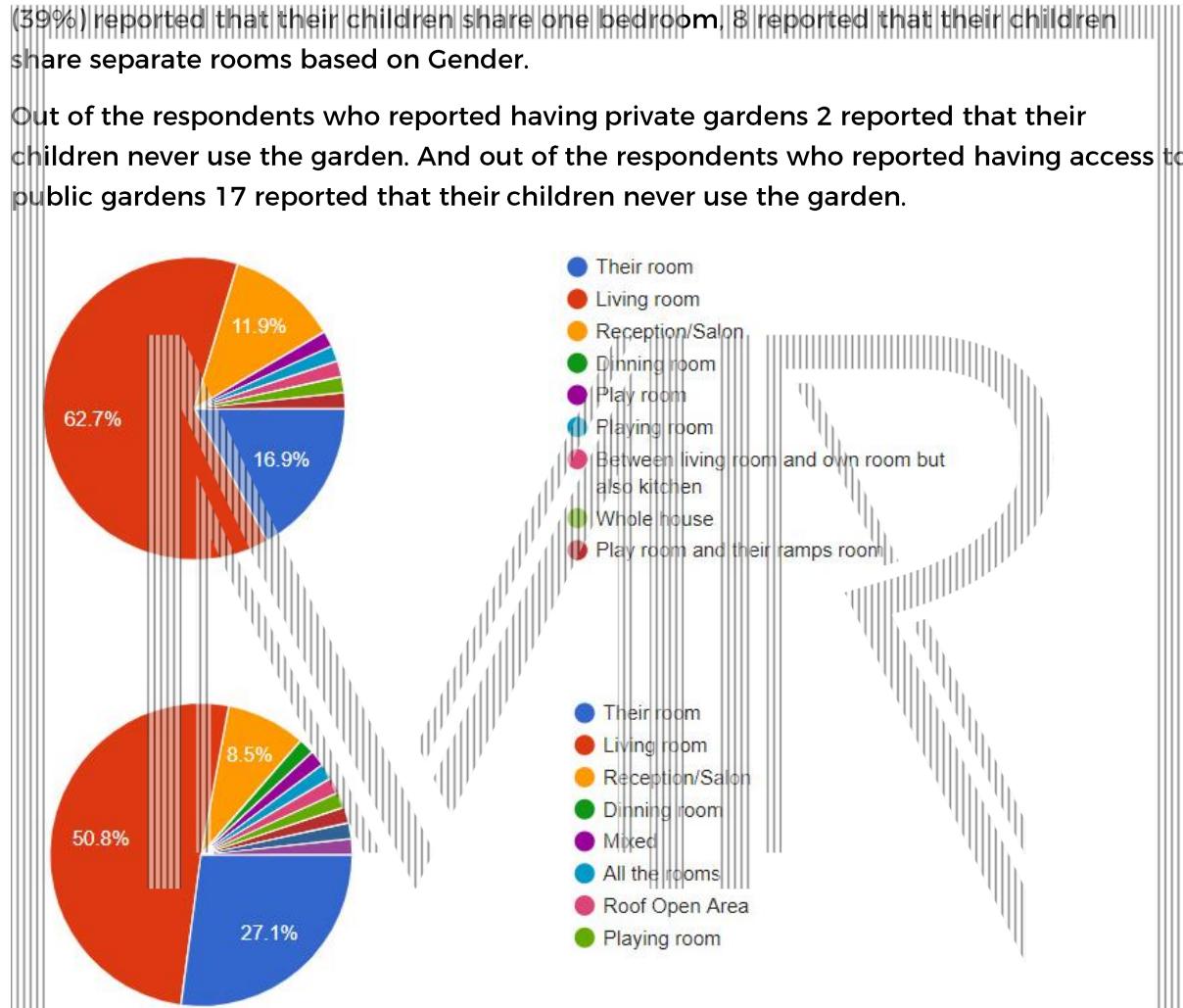


FIGURE 4: TOP, CHILDREN SPACE USAGE PRIOR TO LOCKDOWN; BOTTOM, CHILDREN SPACE USAGE POST LOCKDOWN

37 respondents (62%) reported that the main house space where their children spent time the most before the lockdown was the living room, and 7 reported that space to be the reception area.

Only 10 respondents (17%) reported that their children spent most of the time in their room, 70% of those were children who had their own rooms.

41 of all respondents reported that the space that the children spent time the most before the lockdown, is the same as after the lockdown, while only 18 respondents (30%) indicated a change of space usage.

**Children Behavior and their use of space under quarantine**

This is a research survey to be conducted by Architect Mohamed M. Radwan, in the course of preparing for Masters of Science in Architectural Engineering and Environmental Design, the information shared will be used for academic purposes only, and is protected by confidentiality laws. Thank you for participating.

The name and photo associated with your Google account will be recorded when you upload files and submit this form.

\* Required

Email address \*

Your email

Name \*

Your answer

What is your city of residence? \*

Your answer

What is your profession? \*

Your answer

Are you working from home? \*

Yes  
 No

Is your spouse working from home? \*

Yes  
 No  
 Not Applicable

How many children do you have? \*

1  
 2  
 3  
 4  
 More than 4

Do you have a dedicated Nanny/Helper? \*

Yes  
 No

How many of your children are home schooling? \*

None  
 1  
 2  
 3  
 4  
 More than 4

What are age groups of your children \*

Below 2 years  
 2 - 7 years  
 7 - 11 years  
 11 - 15 years  
 Above 15 years  
 Mixed  
 Other:

What are age groups of your children \*

Below 2 years  
 2 - 7 years  
 7 - 11 years  
 11 - 15 years  
 Above 15 years  
 Mixed  
 Other:

Describe your home type \*

Apartment  
 Town House  
 Semi attached house unit  
 Detached house/villa with no garden  
 Detached house/villa with garden

How many rooms are in your house? \*

2 Bedrooms + Reception area  
 2 Bedrooms + Living room + Reception area  
 2 Bedrooms + Living room + Dining room + Reception area  
 3 Bedrooms + Reception area  
 3 Bedrooms + Living room + Reception area  
 3 Bedrooms + Living room + Dining room + Reception area  
 4 Bedrooms + Living room + Reception area  
 4 Bedrooms + Living room + Dining room + Reception area  
 Other:

What type of space does your kids occupy? \*

1 Shared Bedroom  
 Shared Bedrooms Based on gender or age  
 Each kid has their own room  
 Other:

Does your house have a garden? \*

Yes  
 No

If yes, how often do your kids use this garden? \*

Not Applicable (No Private Garden)  
 Multiple times a day  
 At least once a day  
 Multiple times per week  
 At least once a week  
 Never

Do you have access to public or semi public gardens where you live? \*

Yes  
 No

If yes, how often do your kids use these semi public gardens? \*

Not Applicable (No Public Gardens)  
 Multiple times a day  
 At least once a day  
 Multiple times per week  
 At least once a week  
 Never

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**FIGURE 5: ONLINE QUESTIONNAIRE SECTION 1**

**Children Behavior and their use of space under quarantine**

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The name and photo associated with your Google account will be recorded when you upload files and submit this form.

\* Required

**Section 2**

**Changes to Home Setting**

Before the covid19 lock down, which rooms in your house did your children spend time the most in? \*

Their room  
 Living room  
 Reception/Salon  
 Dining room  
 Other:

Average time of stay in that space? \*

Choose

After the covid19 lock down, which home space are your children spending time the most in? \*

Their room  
 Living room  
 Reception/Salon  
 Dining room  
 Other:

Average time of stay in that space? \*

Close

Pick the group of physical features of that describe this space the best (You can pick more than one) \*

Open Space  
 Semi Closed  
 Closed  
 TV in room  
 Gaming Console (PS or X-Box)  
 Couch Seating  
 Chairs Seating  
 Large Table  
 Small Table  
 Toy Box  
 Other:

Did any changes to the physical features of this space occur after the covid19 lock down? \*

Yes  
 No

Describe the changes to the physical features of this space after the covid19 lock down if any changes occurred

Your answer

Do you mind uploading a photo of this space now?

**Section 3**

**Changes to Children Behavior**

Pick the dominant behaviors of children \* \*

Active  
 Very Active  
 Sportive  
 Calm  
 Shy  
 Sensitive  
 Moody

Other:

Did any changes occur to your children behavior after or due to the covid19 and the lock down? \*

Yes  
 No

If yes, please describe the changes to their behavioral patterns post lock down.

Your answer

Where do your Children do their home schooling? \*

Their room  
 Living room  
 Reception/Salon  
 Dining room  
 Other:

Where do your Children play the most? \*

Their room  
 Living room  
 Reception/Salon  
 Dining room  
 Other:

Which are their prevalent play activities (You can pick more than one) \*

Physical outdoor Play activity  
 Physical indoor Play activity  
 Video Games  
 Creative Play (board games, puzzles, Lego... etc.)  
 Free Play (Reading, Music)

Did any changes occur to your children Play activities after or due to the covid19 and the lock down? \*

Yes  
 No

If yes, please describe the changes to their play activities post lock down.

Your answer

Would you like to participate in a short interview about the change in your children's behavior post Covid19 lock down? \*

Yes  
 No

If your answer is Yes, please list your phone and we will get in contact with you.

Your answer

**FIGURE 6: ONLINE QUESTIONNAIRE SECTIONS 2 & 3**

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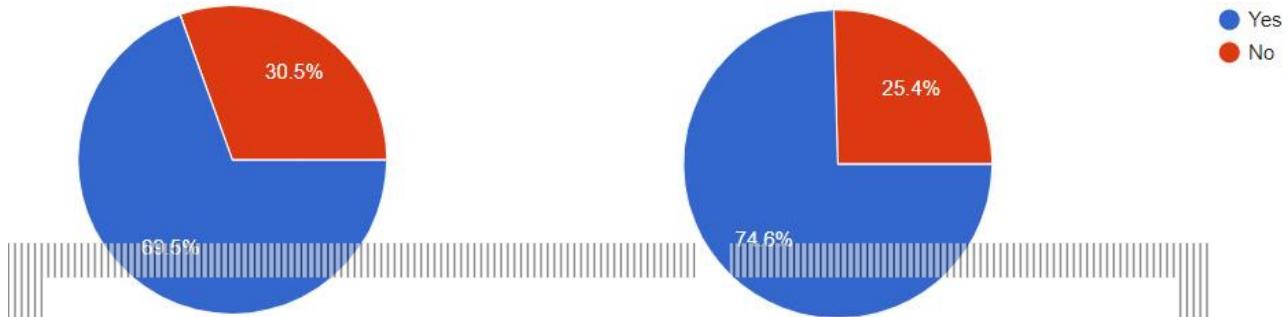


FIGURE 7: LEFT, REPORTED BEHAVIOR CHANGES; RIGHT REPORTED CHANGES IN PLAY ACTIVITY.

41 respondents (69.5%) reported changes to their children's behavior post lockdown, with the majority of reported changes ranging between increase in stress, anxiety, aggressive behavior and mood swings, but only 19 of those (46%) reported changes to physical setting to correspond to the behavioral change.

44 respondents (74.5%) reported changes to their children's play activities post lockdown, with 17 of those (38.5%) reporting more screen time and video games.

Overall 25 respondents reported some change to physical setting of their house due to the Covid 19 lockdown, and the majority of those, 16 respondents (64%) came from the families living in apartments, with little or no access to gardens and outdoor spaces.

Despite having questions related to the type of changes to the physical setting, and the nature of changes to the children behavior, the online questionnaire had qualitative limitations in revealing the exact qualities of both. Rather it was used as a guideline to the in-depth semi structured interviews with the respondents who indicated a willingness to participate in the interviews, 15 respondents accepted to participate in the interview.

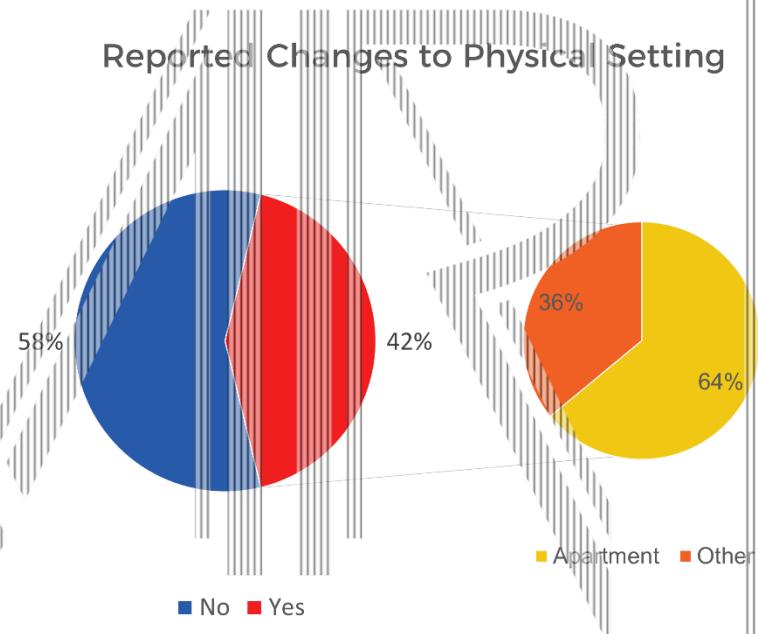


FIGURE 8: PERCENTAGE OF REPORTED CHANGE VS. NO CHANGE, AND APARTMENT TO OTHER PERCENTAGES IN RELATION TO REPORTED CHANGES

Add TV and game console	
Added more sensory play items + reorganized	
Added the PS + toys to the place	
closing the day bed to be single bed and gain more space for the room	
Converted a crib to an extra bed / sofa	
Dinning table converted to Home school study table	
got dining table in living room	
Got new curtains.. New carpet.. New desk for my husband.. New plants	
Home schooling table chair to work from own room rather than study room	
It's messier	
More messy and gets dirty by the hour	
More toys as we literally spend all day there	
Moved the dining table aside and added a play area in the middle of the reception	
No changes	
none	
None	
None	
Nothing	
Nothing much	
Playing table for the youngest one	
The kids spend all the time watching YouTube and play in ps	
They used to go to their room sitting on their desks to study or to sleep, but now they us their time on the internet	
We added a small table with chairs for working and study in the living room	
We changed the workspace to face the window, we allocated a comfy corner for our da	
her playdate classes, we allocated more organized spaces for her toys and material	
we maked it more fun , by buying more games	
We moved around the couches and the PS4 went up to the bedroom	

FIGURE 10: COLOR CODING THE ANSWERS TO THE QUESTION "DESCRIBE THE CHANGES TO THE PHYSICAL FEATURES OF THIS SPACE AFTER THE COVID19 LOCKDOWN"

Bored / stressed / not focused / not active	
Bored and lacking motivation	
Bored and moody. Sometimes lazy	
Both became more lazy	
Calmer & less active	
Feeling isolated, not able to go to play with neighbours	
First he got more relaxed since he had just started nursery. He liked staying at home and spending more time with me. His nap and sleep changed dramatically, he used to nap at 12:30, then sleep at 8:30, he started napping at 3 then sleeping at 10, now he skips the nap and sleeps at 7:30-8 before the sun sets even.	
He became more lazy and moody.	
Kids were enthused about working on Laptops for home school and reported learning more from home school without the stress of waking very early to dress up in uniforms. They mostly stopped truancy, going to regular school.	
More calm and quiet	
More demanding and more verbal about their needs. Jealousy as they're very closed in -age.	
More electronic time and less activities	
More hyperactive at home which is expected given that she gets out all her energy at home	
More moody	
more screen time than ever between the online classes online games with friends , video calls with friends, tik tok	
My son became more calm, my daughter doesn't want to zoom call her friends (if this is relevant to the question)	
Needs more activity because no sports/club outside home. Frustrated w lack of social opportunities makes her sad and angry even with frequent Zooming	
Nervous attacks and insobriety	
Nervous, Angry, aggressive	
Nervous, stubborn, bored, selfish	
Nervously, boring	
she became more nervous and sad	
She became More sensitive & more nervous	
they are seeking much more attention, Sleeping patterns changed	
They became calmer and happier due to the quality time and being able to focus on them, especially the younger one. Of course, they are also bored.	
They became nervous	
They've become more cranky and increased level of boredom.	
very active, moody and sensitive	

FIGURE 9: COLOR CODING THE ANSWERS TO THE QUESTION "DESCRIBE THE CHANGES TO YOUR CHILDREN'S BEHAVIORAL PATTERNS POST LOCK DOWN"

However, the answers to the qualitative questions were coded and analyzed to reveal patterns and insights before conducting the interviews.

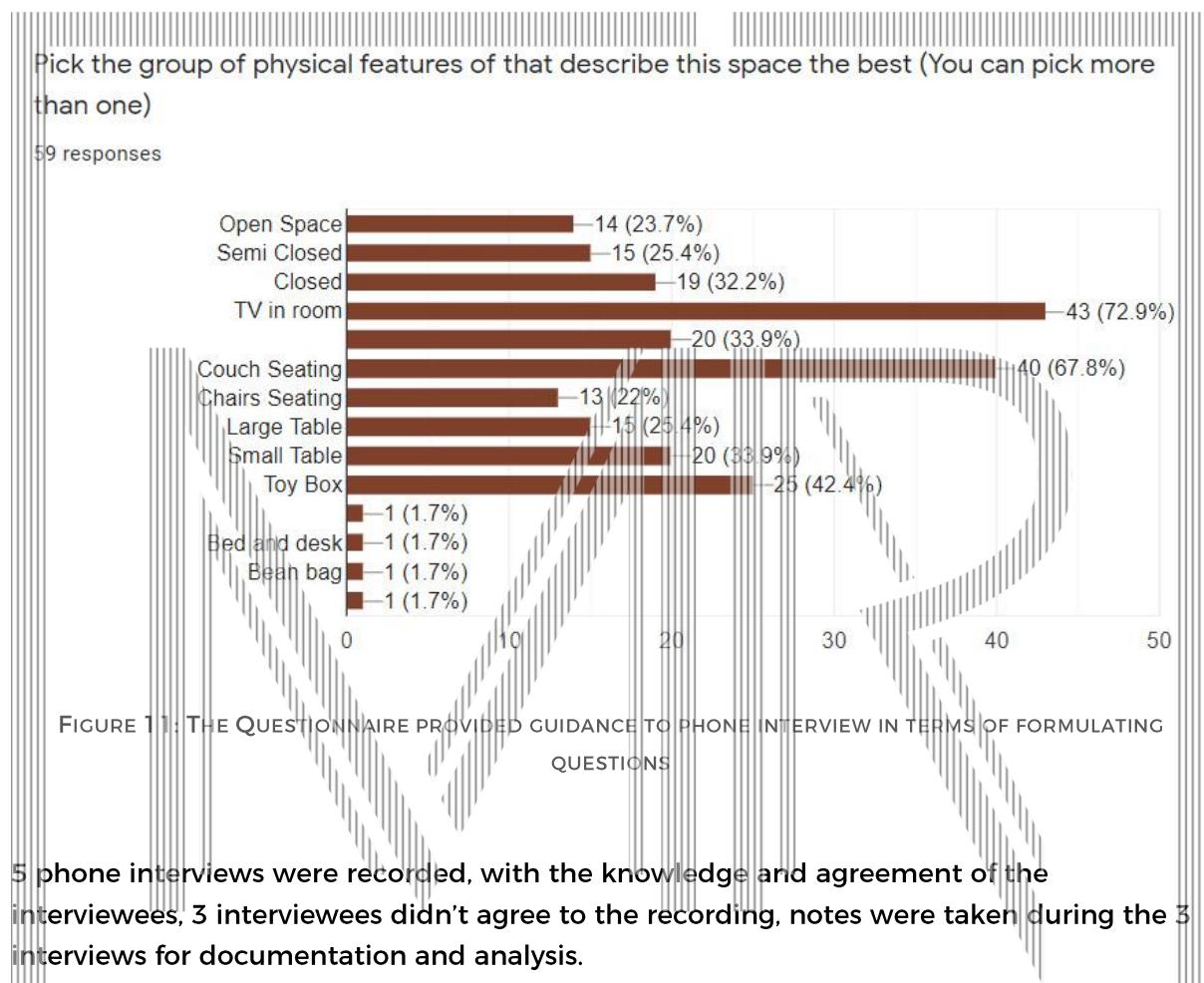
Recurring themes in the answers to questions about the change to physical features were the addition of educational setups and features for home schooling, getting more toys and adding dedicated play areas, and introducing video gaming console setups.

Recurring behavioral patterns in the answers to questions about the changes of children behavioral patterns, were the addition of setups and features for education and home schooling, getting more toys and adding dedicated play areas, and introducing video gaming console setups.

The interview participants were also chosen based on the photos uploaded with the questionnaire, which were optional. Out of all respondents, only 8 uploaded photos.

## The Phone Interviews

Based on the findings and results of the online questionnaire, semi structured phone interviews were conducted with some of the questionnaire. 11 respondents agreed to participate in the phone interview, however, due to scheduling issues 8 only were able to partake in the interview.



5 phone interviews were recorded, with the knowledge and agreement of the interviewees, 3 interviewees didn't agree to the recording, notes were taken during the 3 interviews for documentation and analysis.

The interviews averaged at 10 to 20 minutes, each interviewee was introduced to the researcher and the research purpose, asked for permission for recording, and asked to elaborate on their answers in the questionnaire in relation to three main topics:

- Changes in their children behavior post Covid19 lockdown.
- Changes to how their children perceive and use the home space.
- Corresponding physical changes to the home setting to accommodate new behaviors and usage.

The interviewees were asked open ended questions about their children's reported changes of behaviors, and the changes to the physical settings and space usages that corresponded to these behavioral changes.

**1. Heba G., Housewife, Sheikh Zayed, Egypt.**

**3 children: boys, aged 11, 9, 3 years.**

**No Reported Changes to physical setting prior to the questionnaire.**

**Was inspired by questionnaire to add a playing table to living room.**



FIGURE 12: HEBA G. LIVING ROOM BEFORE ADDING PLAY TABLE

Heba G. reported that her children experienced anxiety, stress and anger with various degrees due to the lockdown, with the middle child being the most affected. According to Heba, he experiences extreme anxiety and anger episodes, and usually acts it out by screaming and aggression. The older child also experiences anxiety but with no anger, and the younger child also has similar anxiety but much milder.

When asked about the reason behind these anger episodes and general anxiety her children are experiencing, she stated that it's due to their extremely active and outgoing lifestyle prior to the lockdown and their separation from family members and friends.

She also stated that despite having access to both a private garden and a public one, these outdoor facilities offered little help with the change of behavior.

She reported no change to the physical setting of her house in the questionnaire, however, in the phone interview she professed that she was inspired by the questionnaire to introduce a playing table in the living area, and that the table helped the children personalize the space and use it much better, resulting in an improvement in their mood and behavior.

**2. Dina M., Housewife, Sheikh Zayed, Egypt.**

**2 teenagers: 15 years old son and 19 years daughter.**

**Reported changes to physical setting: Rearranging the living room seating.**



FIGURE 13: DINA M. LIVING ROOM, NO CHANGES EXCEPT TO SEATING LAYOUT

Dina M, reported that she and her husband are both staying at home since the lockdown started. She stated that her teenage son and daughter experienced slight behavior changes in the beginning of the lockdown, where they became more restless due to limitation of movement and isolation from friends. These changes alleviated as the lockdown period continued, and as the two teenagers adapted to the new post pandemic lifestyle.

Each of the two teenagers has their own room, which resulted in minimizing privacy and territorial issues. Changes carried out to the main living room, where the family spends most of the their time, included moving the gaming console to the son's room to prevent noise, and rearranging the seating layout to better suit the family extended stay in that space.

3. Nevine A, Housewife, California, USA.

1 son, 3 years old.

**Reported changes to physical setting: Adding more toys and a child desk to the living room and reorganizing seating.**

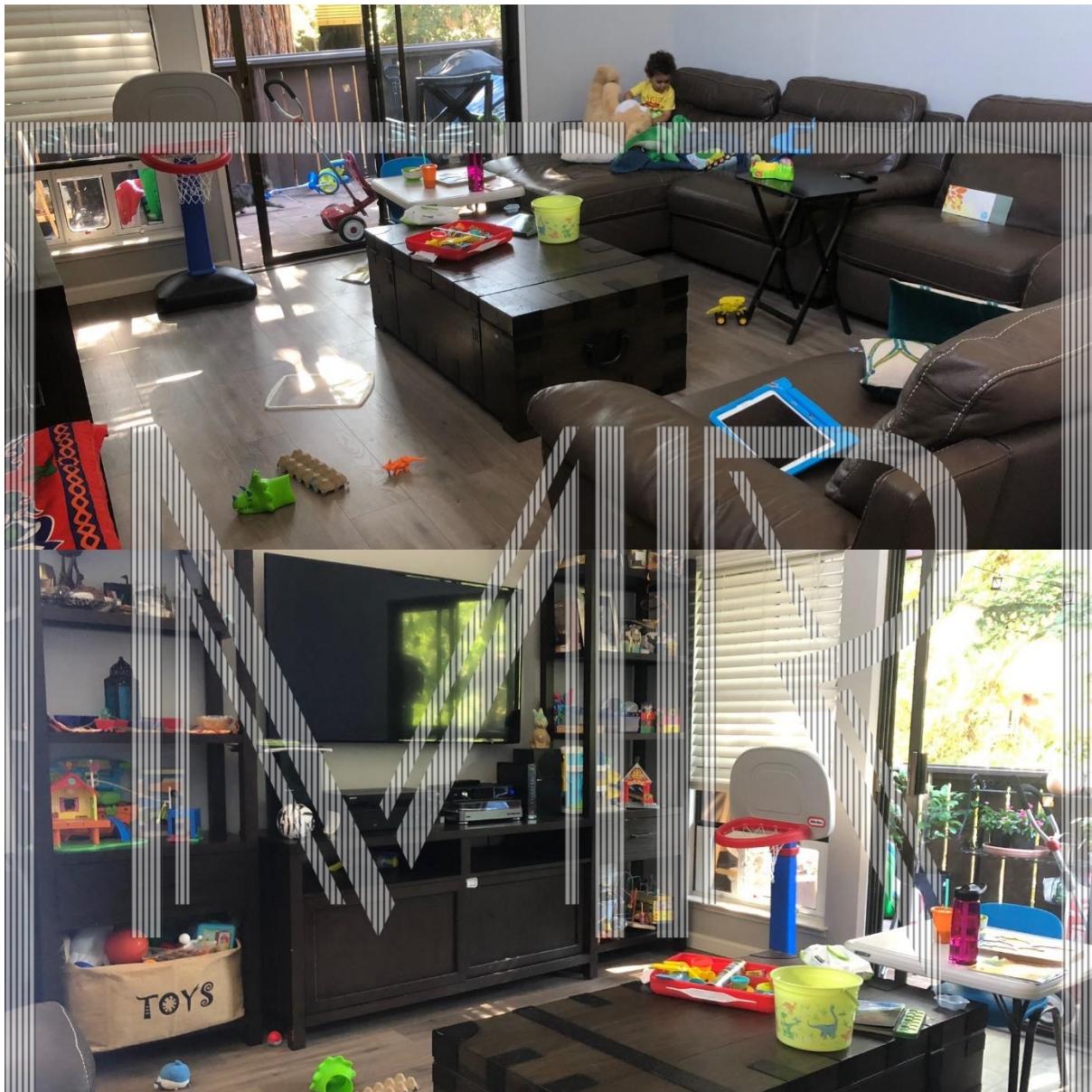


FIGURE 14: NEVINE A. ADDED MORE TOYS AND CHILD DESK

Nevine A. reported that her son felt more relaxed and much calmer since the lockdown started. And since he is a preschooler he was not affected by the limitation of movement and isolation from friends, as much as older children. She did however report a change in sleeping patterns and activity schedules although she thinks it's unrelated to the lockdown.

She reported adding more toys and a small desk to the living room to allow for educational play activities.

4. Maha F., Events director WFH, Maadi, Egypt.

2 Children: boys, aged 7 years & 8 month.

**Reported changes to physical setting: Change of reception layout - 2 weeks into lockdown.**

**Adding a Play area - 1 month into lock down.**

**Relocating the Play area - 1.5 month into lock down for better functionality.**



FIGURE 15: MAHA F. REMOVED CENTER TABLES FIRST (LEFT); THEN INTRODUCED A PLAY AREA (RIGHT)



FIGURE 16: FINAL RECEPTION LAYOUT AFTER RELOCATING THE PLAY AREA

Maha F. related that her older son exhibited high levels of anxiety after the lockdown because he was very attached to school friends and cousins, also the lack of outdoor activities factored into the child being very aggressive.

According to Maha, the fact that the child had nearly 3 month left in home schooling, and his anxiety and high level of activity, all factored in her decision to dramatically change the physical setting of the house.

In the beginning of the lockdown she removed the center tables from the reception area to allow for more space for the infant to move and play.

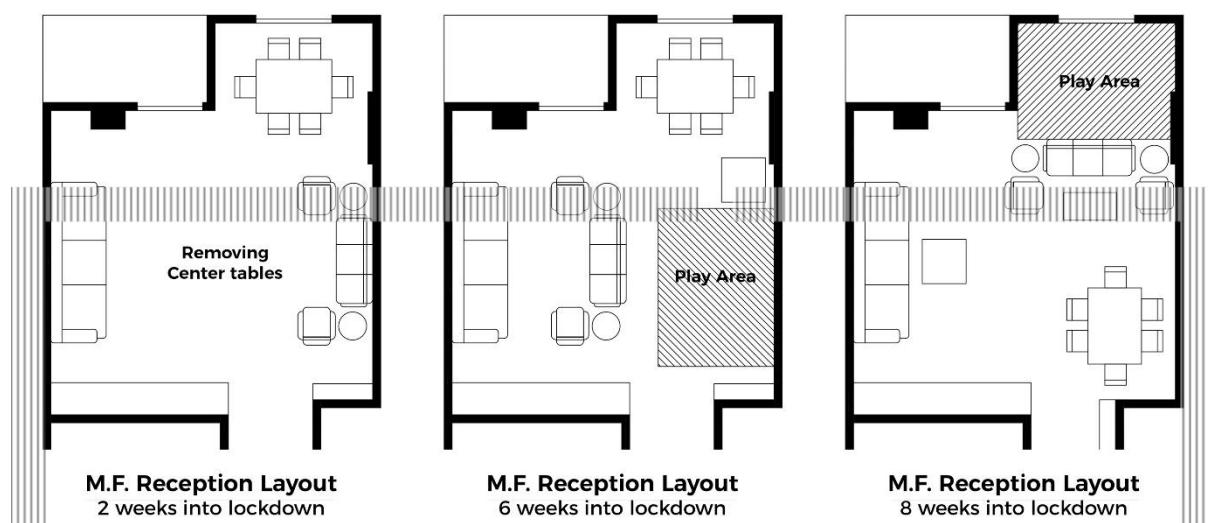


FIGURE 1.7: CHANGES TO MAHA F. RECEPTION OVER THE COURSE OF 8 WEEKS OF LOCKDOWN

6 weeks into the lockdown, she added a play area in the reception where she and her children spend most of their time now. First, she relocated the seating area and introduced the play area in the entrance of the house. 2 weeks later due to functionality issues, she relocated the play area away from the entrance, into the dining area, and replaced it with the dining table where her older son now takes his home schooling lesson.

She reports that this layout is much better because now the sun enters the play area, her children have better defined spaces for both education and play.

Maha also reported that the current setting had an obvious effect on her older son behavior, and that his attention and progress in his home schooling had greatly improved since introducing the play area.

However, she also related that have they had a private garden or access to an outdoor activity area, it was less likely for her to have had created the play area space inside the house.

**5. Menna A., French Teacher (WFH), Dubai, UAE.**

**1 daughter, 4 years old.**

**Reported changes to physical setting: Added Play area in the corridor, and added more toys, small desk and toy cabinet, to living room.**



FIGURE 18: MENNA A. ADDED PLAY AREA IN CORRIDOR; SMALL DESK AND TOY CABINET, TO THE LIVING ROOM

Menna A. reported that her daughter exhibited more anxiety and stress after the lockdown, due to isolation and lack of outdoor activities. This reflected on the child's play activity, who is very active and outgoing, after the lockdown she became extremely aggressive and nervous.

The behavior changes resulted in the parents introducing a dedicated play area, to compensate for the lack of outdoor access, the play area was added in the corridor and not in the child's room for proximity and safety reasons, to be able to keep an eye on her while she plays.

They also added toys and cabinets to the living room and a small desk and chair where she can do her home schooling.

According to Menna, these changes helped her child adapt better to the lockdown, and she became calmer as the lockdown progressed, despite still longing for the outdoor activities and requesting to go out from time to time.

**6. Rana S., Business Owner (WFH), Cairo, Egypt.**

**1 daughter, 8 month old.**

**Reported changes to physical setting: relocated the dining table and added a Play area in reception.**



FIGURE 19: RANA S. ADDED PLAY AREA TO RECEPTION

Rana S. reported that her infant daughter exhibited no change of behavior since the lockdown, due to her very young age.

However she still reported changes to physical setting of the house, where she introduced a dedicated play area, to compensate for the lack of outdoor access, the play area was added in the reception where the mother spends most of her time working from home.

**7. Ingy F., Contracts Administrator (not WFH), Cairo, Egypt.**

**2 Children: Son 9 years old, and daughter 5 years old.**

**Reported changes to physical setting: divided shared bedroom with a separator to give each child their own play and education space.**



FIGURE 20: INGY F. DIVIDED SHARED BEDROOM WITH A SEPARATOR

Ingy F. related little to no change in her children's behavior post lockdown, apart from increased indoor activity due to lack of access to outdoor.

However she did state that the lockdown encouraged her to execute a remodeling of the children shared room which she was considering from even before the lockdown. She introduced a separator wall dividing the room space into two semi separate spaces. 2 thirds of the room for the older son, and one third for the younger daughter.

She reported that this remodeling that was carried out right away in the beginning of the lockdown helped improve their privacy and territoriality, and reflected on their behavior as each child enjoyed an individual play space.

**8. Shams F., Accountant (not WFH), Madinaty, Egypt.**

**2 Children: Son 8 years old, and daughter 4 years old.**

**Reported Changes: added a multiuse table to the living room.**

Shams F. reported high tension and anxiety in her children in the start of the lockdown, however she stated that these behavioral changes soon resided, and that the increased stay at home actually reflected well on the children and their relation together and to their parents.

She justified that improvement to the establishment of new routine and increased communication between the two children.

She reported that due to the lockdown she added a multiuse table to the living room to be used for the dinning of the entire family.

She also reported that due to the extended stay at home, her children are now using the entire house spaces in novel ways:

- Reception is mainly used for home schooling and sports training
- Playing area is living room, bedroom and balcony

## Discussion

Analysis to the results of the questionnaire shows a correlation between physical adjustments to the home setting and behavioral changes, where 72% of the adjusted houses reporting behavioral changes in the children as leading factor for the physical adjustment of the house setting.

A weaker correlation was present between living in apartments with little or no access to outdoors with and the need to apply adjustments to the physical settings of the home environment post Covid19 lockdown. 64% of the adjusted houses were of families living in apartments.

A slight correlation was also found between kids having their own rooms and not needing to apply adjustments to the physical settings (53%) suggesting an emphasis on the role of privacy.

Interviewees expressed a recurring theme of anxiety due to isolation, and stress due to crowding and lack of privacy which echoed Clemens and Lang & Lang arguments.

6 of the Interviewees reported that the behavioral changes in their children resulted in some changes to the physical setting of the home, only 3 of those reported the changes included the introduction of a dedicated play area. 2 of the introduced play areas were in the main living space, and one was directly out of the main living place, but within visual and audio reach of the parents, confirming Johnson hypothesis. It is also noted that the families that resorted to the addition of play area, all had children in the Infancy to preschool phase. This suggests that the middle school stage children do not need that such measures. This also correlates with the findings of the questionnaire, where parents of middle school stage children reported them spending more time in their own rooms, suggesting a preference of privacy among older children.

Interviewees also reported an improvement to the children behaviors and mood, and less anxiety and stress, after the house adjustments. Whether this due to the nature and effectiveness of these adjustments or a mere adaptation to the lockdown is an area for further research.

Many Interviewees stated that after the house adjustments and the 3 month lockdown period, their relation with their children have become stronger, and acknowledged that some of the behavioral changes to them and to their children were positive and are likely to continue post lockdown.

Limitations of this study were in the number of participant who agreed to have the phone interview, only 17 out 59 respondents (29%), and the number of respondents who agreed to upload photos of their homes, only 8 uploaded photos (13.5%).

Further area of exploration are the relation between outdoors activity spaces and the need to adjust the physical setting of the house in such lockdowns. Interviews expressed that access to gardens and outdoors may reduce the need for physical adjustment. However, empirical data from the questionnaire shows otherwise with 68% of the adjusted having direct access to public gardens. This maybe an area for further exploration, to investigate why residents refrain from using public gardens in their neighborhoods.



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