

# Barriers in Digital Workplaces During Covid-19 Lockdowns: a Phenomenological Longitudinal Study Using Actor-Network Theory

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## Abstract

We present a one-year longitudinal phenomenological study that explores how individuals perceived and overcame barriers to remote work during Covid-19 lockdowns. Our study builds upon a previous systematic literature review and utilizes actor-network theory (ANT) to analyze data collected from a survey and two rounds of interviews spaced one year apart. Through this approach, we gain insights into the networks of human and non-human actors that emerged and the challenges faced by remote employees. We compiled a comprehensive list of barriers to anticipate in these circumstances and identified those unique to extreme situations. These findings have implications for companies seeking to establish digital workplaces resilient to future crises.

**Keywords:** Digital workplace, remote work, barriers, Covid-19, lockdown.

## 1. Introduction

Beir's definition of "digital workplace," from the late 1990s, was one of the earliest uses of the expression. The author described it as a place where distributed teams could work together and make decisions, and members of an extended enterprise could collaborate [4]. Existing studies on digital workplaces show that, when implemented correctly, they improve work-life balance and employee satisfaction [15]. However, none of these studies considered the anxiety and social isolation experienced during the pandemic. Recent research has identified new barriers, such as burnout, difficulty prioritizing work, interruptions, overworking, loneliness, and poor health habits [41]. A recent survey involving over 2,000 individuals working from home during the outbreak found that employees worked an additional 28 hours per month on average, increasing the risk of burnout [29].

To investigate this issue further, we conducted a one-year-long longitudinal phenomenological study [11] departing from a previous systematic literature review on barriers in digital workplaces [43]. Our study answers three research questions:

**RQ1:** *What barriers to remote work were experienced during Covid-19 lockdowns?*

**RQ2:** *Which barriers are unique to extreme situations, like lockdowns, versus normal operations?*

**RQ3:** *What human and non-human actor-networks formed around digital workplaces during the pandemic?*

Our work aligns with other recent research motivated by Covid-19, including ICT risk management [37], leadership [49], and misconceptions about digital work [44].

The remainder of this paper is structured as follows: Section 2 summarizes the results

of our earlier systematic literature review on barriers in digital workplaces, which informed the development of our survey and two rounds of interviews. In section 3, we present and discuss our research methodology to collect and interpret data. In section 4, we analyze the data collected, using ANT as a lens to make sense of the complex interactions between human and non-human actor-networks during remote work. In section 5, we discuss our findings and answer the research questions. Finally, in section 6, we provide conclusions, discuss limitations, and suggest avenues for future work.

## 2. Pre-Covid literature on barriers in digital workplaces

We have previously performed a systematic literature review (SLR) on barriers in digital workplaces, following the guidelines proposed by Webster and Watson (2002) [51]. We comprehensively analyzed the full-text of 62 articles. Table 1 summarizes the barriers to a digital workplace before the Covid-19 pandemic, identified in existing studies [43].

**Table 1.** Barriers identified in the literature, adapted from [43].

| Description  |
|--|
| Lack of resources (technical, people, skills, and/or processes)              |
| Role overload and/or role ambiguity  |
| Isolation  |
| Miscommunication (poor or overloaded communication)                          |
| Identity, culture, and diversity differences                                 |
| Workspace conditions (distraction, ergonomic workspace, internet connection) |
| Poor team relationship   |
| Inappropriate information (poor, overloaded, and/or not available in time)   |

Since none of the studies identified in this systematic literature review (SLR) addressed extreme situations such as the COVID-19 pandemic and the resulting lockdowns, we designed this study to further investigate remote work and its barriers in such circumstances.

A successful digital workplace implementation relies on the organization's openness to innovation while providing a more human-centered rather than technology-centered environment [8]. In addition, from an organizational perspective, other factors such as increased investment costs, user reluctance [5], opposition from trade unions [15], increased security risks [3, 8, 12], restrictions with regulatory compliance or internal governance [8], lack of teams' digital literacy [30], and centralized processes and structure [3] are cited as relevant barriers to implement a digital workplace.

Some studies cite new opportunities with the technological advancements, such as augmented reality [5], artificial intelligence (AI) [3, 15], and IVEs-Immersive Virtual Environments (webcams, broadband, shared repositories, and flat-screen 3D graphics) [21].

## 3. Research methodology

A digital workplace encompasses a variety of actors, interests, relations, and conflicts. From a phenomenological point of view, it must be understood in terms of living the experience that is embodied, social, and real. We need to understand how technology shapes the social interactions of employees, co-workers, family, and non-humans, like hardware and processes. These have complex links and influence one another. Actor-Network Theory (ANT) enables us to analyze that reality [9, 27].

### 3.1. A primer on actor-network theory

ANT is an approach to analyze and interpret the interactions between human and non-human actors, built on a social-technical perspective [22]. It supports understanding the complexity of organizations and the active role of technology in shaping social processes in this context [27]. ANT's epistemological and ontological position considers that the world is formed by networks [22], and actors make up these networks. The actors belonging to the networks can include, among others, people, systems, tools, processes, and ideas [27]. Thus, an actor is any human or non-human artifact that causes an action in the network [22]. Moreover, depending on each reality, an actor can only act in

combination with other actors [22].

ANT helps to identify the relationships between the actors, investigate the network movement, and support the achievement of temporary stability [22]. It is relevant to identify the conflicts of interest between the actors and their resulting problems. Subsequently, ANT assists the researchers in balancing the actors' interests [14]. Such balance is affected if any actor is removed from or added to the network [14]. Also, the relationships are more easily perceived when something goes wrong in the network [22]. Callon's so-called "translation process" aims to align the interests of different actors [14]. It has four phases, as follows:

1. In problematization and definition of an obligatory passage point (OPP), the focal actor conceives the problem, and all actors agree upon a set of procedures to achieve the system balance [9];
2. In interessement, the focal actor tries to convince other actors of his interests [9];
3. Enrollment occurs when other actors accept the interests defined by the focal actor and define their new roles in the new actor-network [9]; and
4. Mobilization, the final step, guarantees that actors represent other actors' interests [9].

### 3.2. Data collection

We collected the data to analyze using ANT in three steps. First, we did an online survey, then performed two rounds of interviews with survey respondents, spaced one year apart. The survey (Appendix A) took place from the end of April 2020 to the middle of May 2020 and had 67 respondents. Most (63%) were between 25 and 40 years old, 36% were more than 40 years old, and only 1% were less than 25 years old. We aimed to identify the human and digital actors in the digital workplaces and the main barriers perceived by the respondents. Based on the results, we developed the questions for the interviews (Appendix B, table B1) and identified the necessary characteristics to select the interviewees: (1) individuals with and without children; and (2) individuals already familiar and unfamiliar with remote work.

We performed the first round of interviews from May to June 2020. We contacted a list of eight individuals experiencing the phenomenon to constitute the convenient sample [46]. All participants in the study went through a complete lockdown and were compelled to work from home during this period. They were Brazilian and Portuguese employees working in different organizations. Among the total participants, only 25% were self-employed, 12.5% had fixed-term employment contracts, and the remaining 62.5% had open-ended employment contracts. Additionally, the majority of participants, accounting for 62.5%, were employed in the technology industry sector. Table 2 provides further information on the contextual factors related to the sample participants. We chose email as the medium for the interviews to increase access to participants and encourage greater participation of working adults, for whom synchronous interviews were less feasible [19]. We aimed to identify the barriers experienced in a digital workplace at the beginning of the Covid-19 pandemic, the actors involved, their relations, and the conflicts experienced in this context.

**Table 2.** Contextual factors of the participants comprising the sample.

| Gender | With children | Without children |
|--------|---------------|------------------|
| Female | 1             | 1                |
| Male   | 4             | 2                |

The second round of interviews took place between April and August 2021, involving the same group of eight interviewees. Among all participants, only 25% had partially returned to the office, while the remaining 75% continued to work from home full-time. We developed a new questionnaire (Appendix B, table B2) to understand if the focal actor had overcome the barriers and solved the conflicts one year since the beginning of the outbreak. We also conducted the second round of interviews by email for the same reason cited previously.

The participants received an explanation of the research process and purpose of the

study before the beginning of each round of interviews. Then, they had two weeks to return the filled-in questionnaire.

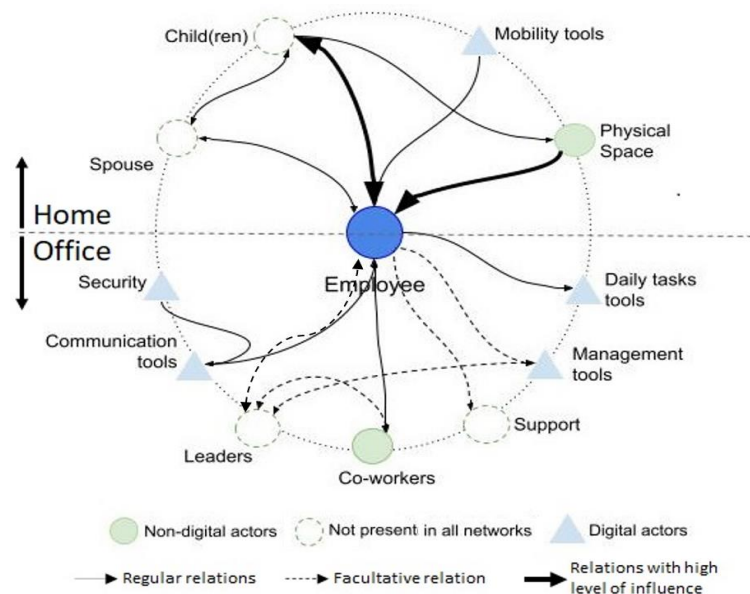
We transcribed and analyzed the data collected in both rounds of interviews by content to identify recurrent statements. We coded the data manually to enable an interpretive analysis to be an experienced phenomenon. We used the ‘top-down’ approach, as proposed by Miller & Fox [31], to answer the research questions. We stored all data in a secure location. In each round of the interviews, we performed three steps for coding procedures. First, we sent the questionnaire to only two participants. Then, we analyzed the data collected to confirm the completeness of the information to answer our research questions. Before sending it to the rest of the sample, any necessary adjustments were made to the questionnaire to ensure a better understanding of the questions and avoid repetition. With the completed database, we carefully coded all answers seeking the feeling of the participants, barriers experienced, benefits perceived, and the involved actors (human and non-human). Finally, we reviewed the answers to ensure accuracy and identified the similarities and differences among coded data.

During the bracketing phase, we tried to set aside our own experiences. To that end, we logged in a journal all biases and preconceived notions that arose during this study.

### 3.3. Data analysis

The answers from the survey provided the initial data that enabled us to identify the human and non-human actors and apply ANT to study the networks formed among them during remote work under lockdown. These data were further enriched by conducting two rounds of interviews with the survey respondents.

First, we identified the human and non-human actors involved in this context: employee, children, spouse, physical space, mobility tools (mobile, Internet, and notebook), leaders, co-workers, support team, communication tools (e.g., Zoom), security, management tools, and daily tasks tools. Then, we sketched the typical network experienced by employees during the outbreak, represented in Figure 1. We considered the employee as the focal actor in the network. The common interest was to keep everyone safe while maintaining regular activities and work (with minimal possible impact) during the outbreak caused by the Covid-19 pandemic.



**Fig. 1.** Typical employee's network in a digital workplace during the Covid-19 pandemic.

We confirmed the use of a technological toolkit similar to that reported in the literature, consisting of a laptop, Internet access, and a communication tool (email, videoconferencing, mobile, chat, and blogging) [3, 6, 16, 17]. More than 80% of the survey respondents used these tools and devices for working in a digital environment.

#### 4. Barriers experienced by employees working remotely during the Covid-19 lockdown

As the pandemic prevented co-located work, the actors needed to establish new agreements and procedures to achieve a common purpose. Competing interests and barriers originated some conflicts. Table 3 shows the main barriers identified in the online survey. This consolidation of barriers experienced by employees working remotely during the Covid-19 lockdown answers our RQ1.

**Table 3.** The barriers experienced by the employees during the lockdown.

| Barrier   | Percentage | Respondents |
|---|------------|-------------|
| General anxiety regarding the impact of Covid-19                                    | 38.81%     | 26          |
| Isolation   | 35.82%     | 24          |
| Difficulty accommodating job tasks with the child's care and home-schooling         | 34.33%     | 23          |
| Difficulty keeping a work routine   | 34.33%     | 23          |
| Distractions and Interruptions  | 29.85%     | 20          |
| Poor physical workspace conditions  | 28.87%     | 18          |
| Poor communication with co-workers  | 25.37%     | 17          |
| Poor internet connectivity  | 14.93%     | 10          |
| Lack of support to perform my job   | 14.93%     | 10          |
| Lack of adequate tools or information needed to perform the job                     | 4.48%      | 3           |
| Lack of knowledge to perform my job using the needed tools in the digital workplace | 1.49%      | 1           |
| I'm ill or supporting people with the illness                                       | 0%         | 0           |

Some of the barriers are common to those cited in studies about digital workplaces made before the pandemic, such as isolation, poor physical workspace conditions, poor internet connectivity, distractions and interruptions, and poor communication with co-workers. However, new barriers were experienced by employees during the lockdown, such as difficulty keeping a work routine, difficulty in reconciling job tasks with children care and home-schooling, and general anxiety regarding the impact of Covid-19. These are the barriers experienced only in extreme situations, which answers our RQ2.

The first round of Interviews with the survey respondents focused on understanding the first stage of ANT's translation process (problematization). Each focal actor had his/her network, so we captured the similarities of each. Figure 1 represents the actor-network experienced by employees working remotely during the Covid-19 lockdown. Further, Tables 4.1 and 4.2 describe the existing interests and problems of the human and non-human actors identified in the network. These two outcomes answer our RQ3.

**Table 4.1** The human actor's interests and problems.

| Human actor                         | Interests   | Problem  |
|-------------------------------------|---|--|
| Employee (with children)            | Accommodate job tasks with the child's care and home-schooling                | Guilt or frustration (not able to handle all tasks well)                           |
| Employee (without children)         | Accommodate the job tasks in dedicated working hours                          | Burnout caused by the employer's expectation of always being "on"                  |
| Leader                              | Keep productivity during the outbreak.<br>Need for short-time decision-making | Monitoring employees' activities.<br>Lack of data or information                   |
| Child                               | Receive the primary needs, attention, and home-schooling support              | Receive support during parents' working hours                                      |
| Spouse (with children, working)     | Accommodate job tasks with the child's care and home-schooling                | Time competition for both parents  |
| Spouse (with children, not working) | Support everyone at home  | Too many obligations to handle   |
| Co-workers                          | Collaborate to achieve organizational goals                                   | Difficulty finding a colleague to get information or support during the activities |
| Support team                        | Support remote workers  | Employees do not meet the process of how to get the remote support                 |

**Table 4.2** The influence of the non-human actors from the focal actor's perspective.

| Non-human actor            | Focal actor's interests   | Focal actor's problem   |
|----------------------------|---|---|
| Physical workplace         | Set up an ergonomic home office environment                         | Missing an ergonomic chair or not being able to work without interruption and distraction |
| Mobility tools and devices | Have the laptop, Internet, and mobile devices available when needed | Excessive network traffic and no agreement on whom are responsible for that               |
| Communication tools        | Support information sharing and facilitate people interaction       | Continuously switching between messages, tasks, and projects can decrease productivity    |

|                          |   |   |
|--------------------------|---|---|
| <b>Security</b>          | Protect data access                                       | Leakage of sensitive data, confidential records, and files                        |
| <b>Daily tasks tools</b> | Enable employees to perform their jobs                    | Lack of familiarity with the tools  |
| <b>Management tools</b>  | Enable teams' self-management and support decision-making | of access to informal information and lack of integration into the entire process |

In the first round of interviews, we could divide the results from the sample into two distinct moods: gratitude and anxiety. The grateful interviewees felt secure at home, with their families, while maintaining a job during such an uncertain time. On the other hand, the lack of predictability about the future provoked anxiety in the other half of the sample. The employees on a temporary contract felt insecure. Further, we identified a sense of guilt when both parents worked, and the children were under six years old. One of the participants stated, "(...) *having to combine my work activities with my daughter's school activities affected me negatively. I often felt guilty about leaving my daughter watching TV to be able to work*". For those parents, accommodating job activities, housekeeping, home-schooling, and children care – many of these during traditional office hours – were relevant barriers. The inability to allocate physical spaces at home for the various activities and actors generated conflicts. Inadequate workspaces due to the lack of a dedicated desk, ergonomic chair, or noisy environments were cited as having a significant negative impact, as were distractions, interruptions, and the lack of social interaction. Moreover, the employees without adequate tools (e.g., management and knowledge sharing tools) to perform their tasks perceived remote work as a poor work arrangement model. Many had less or no disposition to practice regular physical activity, even though previous studies identified it and gratitude as relevant factors for individual well-being [42, 52]. One of the participants stated, "*I'm not doing any physical activity. I lack the mood.*"

The interviewees shared different views regarding the return to a physical workplace (in-office). Three of them declared preferring this alternative, two others would choose to continue at home, and three participants showed interest in combining both (home office and company's office). The participants who preferred a digital or hybrid model perceived increased interaction with their families and less commuting time as benefits.

Callon [9] proposes to identify the obligatory passage point (OPP) to solve the conflicts and pursue network balance. The OPP is the set of mandatory procedures commonly agreed upon by all actors to achieve the balance of the system [9]. Our focal actor is the employee, so his/her interests drive the OPP. To enhance the resilience capabilities of organizations, it is essential to align the goals of all human and non-human actors involved in the organization's functioning. This alignment helps create a shared goal among them that ultimately benefits the focal actor.

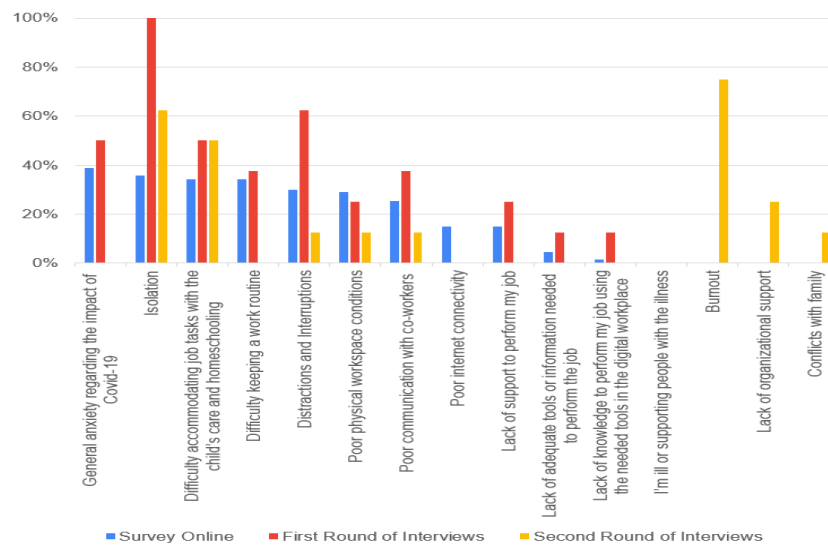
Although this study did not focus on ANT's phases of interessement, enrollment, and mobilization, we revisited these topics during a second round of interviews with the same participants one year later. We wanted to determine if the focal actors had made progress in achieving network balance, including how they convinced others to accept their problematization and agree on solutions. Overall, the actors were able to argue and establish some needed procedures with other actors and enroll the network to achieve balance. The isolation feeling decreased by about 37.5%. Also, we did not identify general anxiety and difficulty keeping a work routine in the second round of interviews. However, accommodating home-schooling during working hours remained a problem that impacted 50% of the focal actors. Furthermore, new conflicts arose, caused by a heavier burden of increasing work-related meetings and the sense of being almost constantly online. Stress and burnout became more evident.

Nevertheless, almost half of the participants described the experience as a good surprise after the first year of adaptation and resilience. Organizational support, such as reimbursement of Internet expenses, support for practicing physical activity, or psychological support, positively influenced the employees' experience. However, most companies provided only technical and material support, raising employees' difficulty in overcoming the experienced barriers. Employees expected emotional support also, such as mindfulness training. Only one respondent showed interest in returning to work face-to-face due to the need for equipment only available at the physical workplace. The majority preferred to keep working remotely or in a hybrid model. The interviewees cited the

following situations as relevant for in-person contexts: easy access to people to get information, keeping sporadic contact with the team, meeting new clients, and informal time with co-workers. Little was mentioned regarding changes to the organizational processes to make them better suited to digital work. Usually, the managers followed up with employees via email, mobile, or videoconference status meetings.

## 5. Discussion

We set out to understand how an extreme phenomenon like Covid-19 and its lockdowns aligned with what was previously researched about barriers to remote work. The online survey addressed the first research question (RQ1). Then, we confirmed the barriers experienced by employees working remotely during Covid 19 lockdowns in two rounds of interviews. Figure 2 shows the barriers identified during the online survey (blue) and the first and second rounds of interviews (red and orange, respectively).



**Fig. 2.** Barriers identified during the three stages of data collection.

We identified a set of common barriers at the beginning of the pandemic, both in the online survey and the first round of interviews, as the most relevant to employees, such as anxiety, a feeling of isolation, difficulty reconciling job tasks with the children care, difficulty in keeping a work routine, and distractions and interruptions. Table 5 consolidates the barriers experienced in extreme situations vs. normal operations.

**Table 5.** The barriers experienced in extreme situations vs. normal operations.

| Barrier   | Extreme Situations | Normal Operations |
|---|--------------------|-------------------|
| General anxiety regarding the impact of Covid-19                                    | X                  |                   |
| Difficulty keeping a work routine   | X                  |                   |
| Difficulty accommodating job tasks with the child's care and home-schooling         | X                  |                   |
| Isolation   | X                  | X                 |
| Distractions and Interruptions  | X                  | X                 |
| Poor physical workspace conditions  | X                  | X                 |
| Poor communication with co-workers  | X                  | X                 |
| Poor internet connectivity  | X                  | X                 |
| Lack of support to perform my job   | X                  | X                 |
| Lack of adequate tools or information needed to perform the job                     | X                  | X                 |
| Lack of knowledge to perform my job using the needed tools in the digital workplace | X                  | X                 |

Employees who had support from other actors (e.g., spouse, leader, or adequate tools) more easily overcame initial barriers. The majority of the interviewed parents declared no availability to practice regular physical activities. However, employees who managed to allocate time for themselves were less susceptible to burnout than those who did not. This finding aligns with previous studies that show the relevance of regular physical activities in improving life satisfaction during confinement [52].

Furthermore, we observed that individuals experiencing a feeling of gratitude (for being safe) were aware of the difficulties but were more willing to carry out their tasks than the employees feeling anxious. Recent research by the Harvard School shows that grateful people can improve their health, deal with adversity, and build strong relationships [42]. Providing mindfulness training in the workplace and reinforcing managers to recognize the people who work for them are some examples of promoting gratitude regularly with employees [42]. We have also identified various practices in the literature that can help overcome the perceived barriers by employees in a digital workplace. These practices can support the focal actor in establishing the necessary procedures to proceed with the interestment, enrollment, and mobilization phases. For instance, the feeling of isolation can be mitigated by organizational incentives for physical activities [42, 52] or by promoting social events between co-workers [50]. Furthermore, poor communication with co-workers and a lack of adequate tools or information needed to perform the job can be avoided by utilizing flexible communication methods [45], such as synchronous vs. asynchronous and virtual vs. face-to-face communication, enabling the flow of information between teams and departments [28, 48], and adequate tools for sharing knowledge considering oral, written, and electronic communication [23]. Moreover, the lack of knowledge required to perform the job can be overcome using flexible training options, such as interactive training and individual and informal learning with co-workers [2]. Lastly, it is important to caution that before adopting any of the proposed best practices, it is necessary to understand the current organizational, team, job context, and characteristics.

Regarding our second research question (RQ2), which barriers are to be expected only in extreme situations (like lockdowns) vs. normal operation, we observed that some are common to those identified in pre-pandemic studies about digital workplaces. For example, isolation, poor physical workspace conditions, poor internet connectivity, distractions and interruptions, and poor communication with co-workers. However, new barriers were experienced by employees during the lockdown, such as difficulty keeping a work routine, difficulty reconciling job tasks with children care and home-schooling, and general anxiety regarding the impact of Covid-19. Furthermore, new barriers arose as the situation prolonged, such as burnout due to increasing meetings and worked hours, lack of organizational support, and conflicts with family.

The effectiveness of digital tools plays a significant role in how employees experience the digital workplace. Some organizations were unprepared for such a dramatic overnight change in their work routines, so employees were confronted with inadequate mechanisms to manage, participate in organizational processes, communicate, access information, and share knowledge. In these cases, they felt that the digital workplace was unsuitable for their job activities and tended to prefer an in-office or hybrid work arrangement after the outbreak. Some organizations provided technical support to deal with the challenging situation, which had a positive impact. However, the employees still missed the emotional and material support to overcome the conflicts raised by remote working during the pandemic. Still, on the topic of the use of technology, we did not identify new trends such as the use of artificial intelligence, tools to support data management, or Immersive Virtual Environments (IVE) to increase the likelihood of feeling "physically" present.

According to Schaffer et al. [47], organizations need to handle volatility, uncertainty, complexity, and ambiguity seeking to mitigate the barriers. The same authors state that *"resilient organizations are successful in coping with crises,"* and companies should have a business model to bear organizational resilience.

## 6. Conclusion

We identified three different realities in this study: (1) workers with no children; (2) workers with children and both parents working; and (3) workers with children and just one parent working. In scenario (2), employees expressed guilt or burnout due to the inability to care for their children fully. Difficulty accommodating job tasks with the children care and home-schooling and difficulty keeping a work routine were two of the most relevant barriers experienced by the employees during the lockdown. A third was general anxiety regarding the impact of Covid-19. These three barriers were not identified



in existing studies related to the digital workplace before the pandemic [43].

It is not the first time a virus has threatened humanity, and it will not be the last. Therefore, organizations need to have effective strategies to implement a digitally-enabled environment. The importance of this study is to identify the main barriers that influenced employees with digital work during the Covid-19 pandemic. Also, this information is relevant to support organizations implementing a successful digital workplace resilient to cope with future challenges like the Covid-19 pandemic. Organizational support positively influenced employees to overcome the barriers during this period. Moreover, the employees with adequate tools, dedicated time, and space to work remotely had no negative impact on performing their jobs. Even without considering future extreme situations such as Covid, the forced lockdowns and remote work have prompted employees and organizations to reassess conventional workplace setups in favor of digital or hybrid alternatives. Consequently, the support of organizations will be crucial in this new work arrangement model to offer flexibility, suitable workspace conditions, and adequate tools.

The limitations of this work include conducting interviews with a restricted sample of only Brazilian and Portuguese employees, with the different geography and governmental contexts not being considered. Regarding the negative impact on working mothers, future work could focus on a specific study of their experience during confinement. We noticed relevant differences in how the phenomenon especially impacts working mothers, but our sample was insufficient to develop further conclusions. This study did not analyze the impact of remote work on productivity or job satisfaction. Additionally, it did not distinguish the focal actor (employee) by generation or gender, nor did it consider the perspectives of managers or employers. Future work could investigate these aspects to further explore the effects of remote work in a more comprehensive manner. Researchers should also further investigate the new barriers raised in extreme situations (like lockdowns), such as anxiety, difficulty in keeping a work routine, and reconciling job tasks with the child's care and home-schooling.

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## Appendix A. Online Survey

The survey was shared to researchers' contacts and using social media. It was conducted in Portuguese, the native language of the participants. Below is a translation of the questions.

**Table A1.** Survey questions.

|   |
|---|
| 1. What is your level of satisfaction with your current work-from-home conditions? (Options presented are from very unsatisfied to very satisfied.)   |
| 2. Compared to the previous month, do you feel more optimistic or pessimistic about working from home?  |
| 3. What are your THREE main barriers to the digital workplace during the Covid-19 lockdown? (Options are presented in Table 4, column Barrier.)   |
| 4. Do you need any action to be taken or support to perform your job activities during the Covid-19 lockdown?   |
| 5. What business or industry sector does your organization belong to?   |
| 6. Regarding your employment contract, which of the following best describes your current model? (Options presented: fixed-term, uncertain term (indefinite period), freelance, self-employed, or temporary job.) |
| 7. Which of the following best describes your working hours? (Options presented: flexible, working hours, or after working hours.)  |
| 8. During the remote work period, what technologies, devices, or tools do you use?  |
| 9. How does the company follow up and monitor the activities carried out by you?  |
| 10. What is your age group?   |

## Appendix B. Interview Questions

The interviews were conducted in Portuguese, the native language of the participants. Below is a translation of the questions.

**Table B1.** Questionnaire for the first round of interviews.

|  |
|--|
| <b>Professional Information</b>  |
| 1. Profession:   |
| 2. What is your employment contract model (temporary or permanent, partial or full-time, self-employed)?     |
| 3. Have you done remote work before?   |
| 4. What level of familiarity with the digital tools available for remote work?                               |
| <b>Remote work experience during the pandemic</b>  |
| 1. How is your experience with telecommuting during the pandemic?  |
| 2. What were the most influential factors during this experience?  |
| 3. Which feeling would best describe your experience with digital work during the outbreak?                  |
| 4. How does your company support you to carry out your activities at this time?                              |
| 5. During the digital work, what technologies, devices, or tools do you use?                                 |
| 6. Do you need any steps to be taken so that you can do your job without difficulty while working from home? |
| 7. How do you and your spouse organize other activities with the home and child(ren) (if applicable)?        |

**Table B2.** Questionnaire for the second round of interviews.

|   |
|---|
| <b>Professional Information</b>   |
| Name  |
| Are you working in the same place as you were in May/2020 (while filling out the previous questionnaire)?   |
| <b>Remote work experience during the pandemic</b>   |
| 1. Since the beginning of the outbreak, in which period(s) have you worked remotely?  |
| 2. If you are still working remotely, how do you feel about this experience? If you have already returned to the physical office, how would you feel if you should return to work remotely? |
| 3. What has influenced your work the most during this experience (positively or negatively)? (Such as social life, children, organization support, spouse support, ...)                     |
| 4. Which feeling would best describe your experience with the digital work during the pandemic?   |
| 5. How does your company support you to carry out your activities at this time?   |
| 6. Do you need any steps to be taken so that you can do your job without difficulty while working from home?  |