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Navigating the Post-Pandemic Normal: Learning from the Experiences of Cyprus-Based Female Researchers during the COVID-19 Pandemic

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Abstract: The article addresses the new normal for female researchers in the post-pandemic era by utilising information collected from the pandemic period, when disruption to 'business as usual' occurred. This information can inform a new normal that is as efficient, resilient, and ethical as possible. The research employs a case study methodology, with qualitative data collection and analysis approaches. To understand the circumstances faced by researchers in Cyprus during the pandemic, it was necessary to approach several scientists from different research areas and try to understand their experiences through conversations. The set of notes compiled from the completion of the informal conversations were analysed using thematic analysis. Three themes were identified: (a) misperceptions of flexibility in researchers' schedules and workload, (b) lack of flexibility in adjusting expected outcomes or timelines, and (c) inability to compartmentalise personal and professional life. To better contextualise these findings, the study additionally explored survey results published by the European Commission on relevant topics, enabling a critical juxtaposition of the European perspective to the Cyprus-based findings of these pandemic-induced challenges. The study highlights significant misconceptions and overlooked dynamics regarding research conducted in times of crisis and offers avenues for ensuring research quality in analogous future scenarios.

Keywords: post-pandemic; gender; female researchers

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1. Introduction

The COVID-19 pandemic erupted in the last months of 2019 and was declared a pandemic by the World Health Organisation (WHO) just a few months later, in March 2020. The unprecedented health crisis that spread rapidly across the world was caused by a new virus characterised by acute respiratory symptoms, high infection rates and significant mortality rates, all in the absence of available treatment. As a result, the world engaged in the fight to prevent the spread of the COVID-19 virus by minimising contact between people. Lockdowns, quarantines, and curfews, in addition to virtual communication and remote work, became the new normal in formerly fast-paced urban environments, especially cities that host universities, incubators, labs, and research centres.

The "transitional" period, that follows such a "devastating disruption" of conducting business as usual, is known as a post-pandemic era (Raimi and Kah 2022, pp. 255–280). It refers to the process that is followed before managing to achieve a new normal, under which business is conducted in full scale. In the professional realm of conducting scientific research, the post-pandemic era is well underway, and it is a vital period for the collection of lessons learned from conducting research under a global crisis, and for ensuring its ethical standing, quality, and relevance are not compromised. A key end goal of the post-pandemic transition should be to establish a new normal that would ensure preparedness and readiness to secure scientific integrity, specifically in the event of future situations analogous to the magnitude of impact experienced during the COVID-19 pandemic.

The current study aims to uncover insights from the pandemic and contribute to scientific integrity in future research, by focusing on two parameters: (1) gender as a factor in research conduct, and (2) the dynamics of smaller research communities, which we identified through research institutions, universities, and labs in Cyprus. The findings from this study aim to inform the post-pandemic era, leading to a new normal that is as efficient, resilient, and ethical as possible.

1.1. Disruption Examples Caused by the COVID-19 Pandemic

The pandemic had detrimental effects on a vast array of societal issues and directly affected sustainable development, social welfare, and economic progress. With regard to the latter, international economic activity was directly hit by the shutdowns imposed on various segments of the economy. The global annual growth rate plummeted from 2.1% in 2018 to −4.4% in 2020, and economic recovery is still challenged because of new crisis situations impacting the world at large, such as the war in Ukraine (United Nations 2022). The pandemic also broadened income inequality between countries and partly reversed the progress achieved on shrinking global income inequality in the previous decades (ibid.). Global unemployment rates also increased due to the pandemic from 5.4% in 2019 to 6.6% in 2020 (ibid.).

Like most countries globally, Cyprus was directly affected by the pandemic in terms of its economy and labour force (PwC Cyprus 2020). For instance, during the 2020 and 2021 lockdowns, the local hospitality industry—one of the leading industries on the island—experienced its largest halt of operations in its recent history, as did the construction sector, with a direct impact on the local labour force (Stylianou 2021). The events industry postponed conferences, weddings, exhibitions, and other events, while enclosed venues like cinemas, theatres, and indoor playgrounds were forced to shut their premises for months (ibid.).

Online teaching was introduced across academic institutions and universities, while research was also conducted remotely (Plummer et al. 2021, p. 130; Tsangari et al. 2022, pp. 71–90). The principal change for the research community was, as in other parts of the world, the need for researchers to adapt to remote working and conduct their academic duties primarily from home. With regard to research work, the pandemic conditions challenged researchers in their pursuit to achieve their designated outputs at the desired level of quality (Karimi-Maleh et al. 2022, pp. 1–4).

1.2. Work Challenges Faced by Women Amidst the Pandemic and Consequent Research Implications

A position adopted by the European Parliament and echoed by the European Union and the United Nations is that women are evidently disadvantaged against men when it comes to their engagement in the economic, socio-cultural, and political spheres (European Parliament 2022a; United Nations 2021). Unconscious bias alone affects "the way women begin their professional career, how they progress, and the way they manage the obstacles they face" in relation to men (Ventura et al. 2021, p. 12754). This disadvantage makes economic progress and social welfare less sustainable. Thus, it is to the benefit of both men and women for this gender gap to be addressed and bridged (UN Women 2018; International Monetary Fund 2022).

According to the UN's Sustainable Development Goals (SDGs) and their respective indicators (United Nations 2022), an evaluation conducted with reference to the pandemic period for SDG 5 on Gender Equality revealed that even though women accounted for 39% of total employment in 2019, they had 45% of global employment losses in 2020 (United Nations 2022).

The internationally recorded share of unemployment indicated above reveals that women lost their employment at a higher rate than men once the pandemic struck, reaffirming that women face more fragile employment, putting them in a particularly detrimental position in times of crisis. In Europe, a survey by the European Parliament in 2022 to gather

women's opinions, revealed that the pandemic had a negative effect on women's income for 38% of the respondents, with 21% of the women claiming that the pandemic affected the time allocated to paid work (European Parliament 2022b).

There is also a recorded gender pay gap that remains a global phenomenon (European Commission 2020), and the disproportionate burden of unpaid labour that falls on women–including household work, childcare, provision of care to other members of the family (European Commission 2022).

According to Staniscuaski et al. (2021), gender is one of the three main factors that negatively affected academic productivity during the COVID-19 pandemic, the other two being race and parenthood. With a case study of over 3000 Brazilian academics across sectors and disciplines, Staniscuaski et al. (ibid.) identified a decrease in paper submission rates for female authors during the first year of the pandemic. This was due to the unequal division of domestic labour across men and women, an inequality that widened during the pandemic and was further exacerbated in cases where domestic demands included childcare (Minello et al. 2021).

Findings from sector specific research were equally discouraging. In the field of transfusion medicine, there was a drop in publications with female first authors, from 49% in 2019 to 42% in 2020 (Ipe et al. 2021, pp. 1690–93). This drop of 7% is statistically significant and not an isolated phenomenon for transfusion medicine, as a similar drop has also been identified in other medical specialties (ibid.). In the field of biomedical research, a staggering 9.1% drop in publications with female first authors was recorded between 2019 and 2020 (Muric et al. 2021), reaffirming a direct relationship between gender and research output during the global health crisis. A drop in publications for female authors has also been recorded in legal academia due to the pandemic (Deo 2020, p. 2469). Furthermore, junior faculty found themselves at a higher risk of losing their jobs due to "pandemic-related loss of productivity" (Deo 2020, p. 2469). In the technological field, data collected from academic and research staff at the University of Vigo, in Spain, indicated that the pandemic exacerbated gender inequalities, resulting in a decline in research productivity among female academics and researchers (Vázquez Silva and Gómez Suárez 2022).

Gender inequality in professional achievement and development is a cross-sectoral reality that has been recorded historically and, despite efforts for gradual progress towards gender equity, disparities in professional advancement across men and women were further worsened by the pandemic. Moreover, the pandemic impacted the private sphere of many individuals. For instance, reported incidents of domestic violence significantly increased during the pandemic period, when lockdowns and curfews forced people to stay confined in their household (Piquero et al. 2021). In addition to reported incidents, perceptions on the risk of gender-based violence have also shifted dramatically. According to the Flash Eurobarometer 2022, 77% of women across the EU believe that the pandemic has led to an increase in physical and emotional violence against women in their country (European Parliament 2022a).

1.3. Informing Post-Pandemic through Key Insider Perspectives

The challenges researchers faced during the global crisis of the COVID-19 pandemic provide invaluable guidelines on how to safeguard research beyond the post-pandemic era and in the likelihood of future crises. Understanding the specificities and unique dynamics of individual research communities offers key insider perspectives associated with the challenges of the pandemic and the post-pandemic era. Revisiting the 'disruption' to research activity itself can be key to this understanding, specifically how following governmental measures, aiming to mitigate the pandemic's impact, altered the conditions under which research was conducted, and created challenges in conducting research in a timely manner.

Additionally, the current study aims to highlight the impact on female researchers, as findings show that the work of female researchers was disproportionately affected by the pandemic, to the extent that COVID-19 was a pivotal challenge to female researchers, but

oftentimes not as evident for their male counterparts (Davis et al. 2022, pp. 436–38). There is evident consensus among emergent research that the COVID-19 pandemic widened the gender gap in research productivity, with female researchers lying at the disadvantaged end (Cui et al. 2022; Lee et al. 2023; Liu et al. 2022; Pereira 2021). This is a key challenge to acknowledge, as it directly informs gender equality in research and the future of research productivity. An already gendered field, research productivity, recorded a gender gap against female researchers before and despite the pandemic, either due to the use of indicators that benefited men (Nygaard et al. 2022), or due to a recorded lack of research specialization amongst women (Leahey 2006). Addressing the gender gap in research productivity will not only serve COVID-related factors, but research productivity altogether in a post-pandemic normal.

To gain such perspectives associated with the challenges of the COVID-19 pandemic faced by the research community in Cyprus, and specifically female researchers, we approached this investigation as a case study, focusing on the experiences of the research community in Cyprus, and more specifically female researchers. Even though case study approaches often "demonstrate wide diversity in study design" (Hyett et al. 2014), the approach employed for the current case study is hybrid, including both primary qualitative data from informal conversations, and quantitative data reproduced in this report from relevant Eurobarometer reports, since it is important for a case study to consider "data collection involving multiple sources of information" (ibid.).

The data collected through informal conversations with Cyprus-based researchers provide a more in-depth, detailed examination of how the pandemic affected female researchers in Cyprus, and help gain a deeper understanding into whether/how the pandemic was a pivotal challenge to female researchers. After themes were constructed from these informal conversations, the results were contextualised with the quantitative findings from relevant Eurobarometer surveys published by the European Commission on topics relevant to the study. This in turn, enabled a critical juxtaposition of the European perspective with the Cyprus-based findings of potential pandemic-induced challenges. In addition to insights gained from the literature, primary data collected from conversations and secondary data reproduced from the Eurobarometer surveys, serve to enhance the case study findings. This approach, by incorporating insights from a variety of sources, ensures more robust conclusions in alignment with the research objective.

The research objective of this study is to derive lessons learned from conducting research during a global crisis without compromising its ethical integrity, quality, or relevance. This is achieved by identifying key challenges, particularly those related to gender impacts, with a focus on smaller research communities.

2. Data Collection and Analysis

2.1. Informal Conversations Method

To understand the circumstances faced by researchers in Cyprus during the pandemic, it was necessary to approach scientists from different research areas and try to understand their experiences through conversations with them. These conversations were informal, unstructured in format, without pre-selected interview questions, taking place at locations selected by the researchers.

According to Swain and King (2022), "there are actually two distinct types of informal conversation that can be used". These are the "observed conversations" and the "participatory conversations"; in the first case, the researchers are simply observers of conversations, but in the second case the conversations involve an interactive dialogue between the researchers and the participants. Swain and King (2022) advocate for the second approach and suggest that this approach can be used in any general qualitative exploration, including case studies. Similarly, for this case study, the team followed an informal conversation approach for the participatory conversations, where the team members visited the researchers in their own labs, workspaces, and places of convenience.

The data collection through informal conversations was intended to "create a greater ease of communication" and to "produce more naturalistic data" (Swain and King 2022), since the informal approach tends to put people at ease and allow them to share their authentic experiences. In this case, experiences during the global COVID-19 pandemic crisis, and its manifestation in Cyprus were examined. To minimise intrusion into people's lives, the authors did not audio-record the conversations, as discussed by Rutakumwa et al. (2020). Instead, they made notes to capture an overview of the main issues experienced by research participants. To ensure that the conversations were captured successfully, two different sets of notes were taken. The main points recorded were discussed with the research participants at the close of the conversations and what was taken forward was agreed with them.

Five conversations took place physically at different research centres and labs across Cyprus. The first conversation took place in a research centre focusing on research mainly related to environmental science and technology projects as well as innovative educational technology projects, and five (5) researchers were present (4 female and 1 male). The second conversation took place in a STEAM (Science, Technology, Engineering, Arts and Mathematics) research lab, with one (1) female researcher participating, who was working specifically on STEAM literacy projects. The third conversation was with seven (7) female researchers in the field of educational research, at their work premises. The fourth conversation took place with two (2) female researchers from a research lab on historical gender equality, and the fifth conversation took place with one (1) female researcher of cultural studies, who leads a Cyprus-based research lab. Overall, 28 researchers were invited (18 female and 10 male), with 16 eventually participating. It is interesting to note that eventually, we conversed with 15 female participants and 1 male, since most male participants that were invited to participate declined the invitation due to a busy work schedule. In terms of family/cohabitation status, the 16 researchers were mostly married with children (9), with a few researchers cohabitating with their spouse but with no children (4), and some researchers that were living alone during the pandemic (3). Table 1 summarises the overall recruitment.

Table 1. Recruitment for the case study conversations.

Research Lab Focus	Number of Participants	Gender
Environmental science and educational technology	5	4 females, and 1 male
STEAM (Science, Technology, Engineering, Arts and Mathematics)	1	1 female
Pedagogy	7	7 females
Historical Gender Equality	2	2 females
Cultural Studies	1	1 female

Consent forms approved by the Cyprus National Bioethics Committee[1] were signed by the participants prior to the conversations, after informing the participants of the objectives of the conversations and how they related to the overall goals of the research study.

2.2. Thematic Analysis

The set of notes collected from the completion of the informal conversations was analysed using the thematic analysis method (Braun and Clarke 2021, pp. 328–52) to identify, analyse, and interpret patterns of meaning in the qualitative data collected. Thematic analysis "can be applied across a range of theoretical frameworks and indeed research paradigms", since the approach emphasises "an organic approach to coding and theme development" (Clarke and Braun 2017, pp. 297–98). Thematic analysis is a widely used analysis method for qualitative data that can provide a rich description of the data and a detailed account of a particular aspect of interest.

Codes are the smallest units of the qualitative analysis that capture aspects of the text that are interesting and make sense; they are the building blocks for the themes, the larger

patterns of meaning that are discussed as key findings that emerge from the qualitative analysis. Thematic analysis is a qualitative tool that is used in this study to identify key ideas or topics emerging from the set of notes. The set of data can either be guided by a pre-defined research question, or it is also common for the research question to "evolve throughout coding and theme development" (Clarke and Braun 2017), especially when thematic analysis is used to investigate a specific issue or observation in a more inductive[2] (rather than deductive[3]) research approach.

As noted earlier, the conversations were captured by two researchers taking notes. Both sets of notes were used in the thematic analysis to extract the initial codes and eventually, the themes. Figure 1 illustrates the set of codes extracted from the conversation notes, conveniently grouped under these keywords. The following set of keywords represent the four main categorisations of codes identified:

- Caretaker responsibilities and time-consuming commitments.
- Scheduling flexibility in the professional context.
- Data-collection implications during the pandemic.
- Temporary vs. ongoing changes (even after the pandemic).

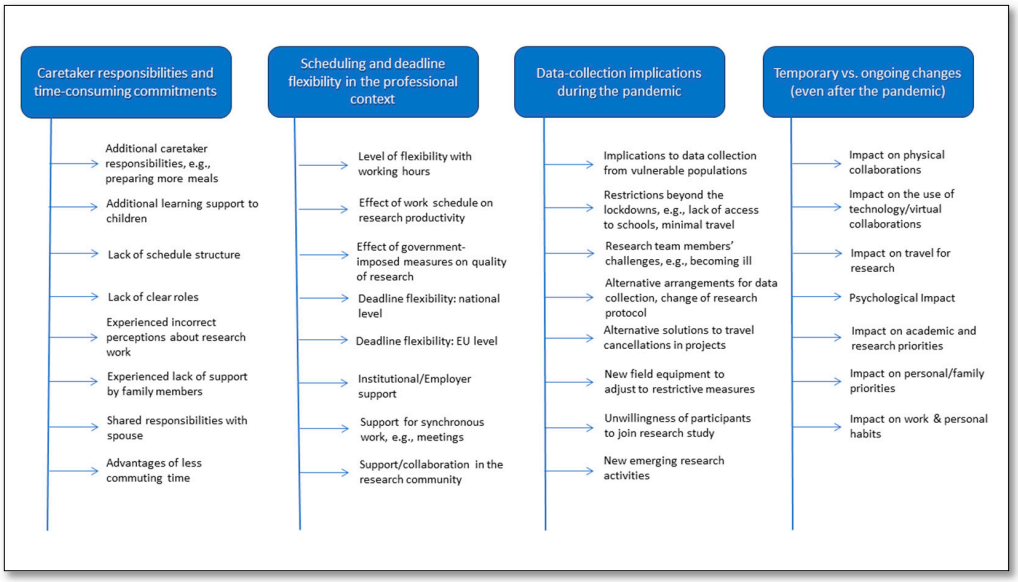

Figure 1. Initial codes extracted from thematic analysis.

Based on the above codes, a more critical study of the coded notes revealed specific themes that seemed to span the notes across the set of conversations. When we refer to a theme, instead of a code, we imply a more focused and contextual understanding of the data. The aim of the present thematic analysis was, therefore, to identify possible patterns within the data. This analysis enabled us to identify useful insights about the experiences of Cyprus-based researchers during the pandemic and importantly, to build an understanding of ways in which gender may have impacted on these experiences. Three main themes were identified, which are elaborated on in the following section.

3. Key Findings

3.1. Misperceptions of Flexibility in Researchers' Schedules and Workloads

Several researchers discussed how the perceived flexibility of a researcher's job, in terms of schedule, by other family members and housemates, was challenging. Such perceptions imposed an additional burden onto the researchers' workloads, as their co-habitants ended up placing lower priority on the researcher's needs for time and space dedicated to their work, mainly during the pandemic-induced lockdowns:

> *"... I had no choice, I had to be with the kids while my husband was working, I had no clear or set working hours . . ."*. (educational technologies researcher)

This was especially evident in households where the working space had to be shared between family members or housemates. Many of the researchers sharing a living space had to complete their research tasks during inconvenient hours when the working space would be available, or their co-habitants would be otherwise occupied. For example, the researchers worked when young children at home would have completed their online classes[4], would be sleeping, or when a spouse with a fixed schedule in terms of working hours would be off the clock, since even when working from home (as per the pandemic-induced measures), many employers required their employees to keep their working-time schedule.

Many female researchers with children at home struggled with the lack of structure in their schedule. There was no clear separation between their different roles throughout the day, e.g., their roles as mothers versus their roles as professionals, especially for those with younger (pre-school-age) children. Some female researchers discussed how even when their partners wanted to be supportive, this support often depended on the nature of their partners' work. Oftentimes, the partner had no flexibility with their schedule, and in some cases the spouses were not working from home, leaving the female researcher with the children. As a result, a lot of the substantial research work had to be carried out in the evenings, especially when young children were at home. In cases where there were young babies in the family, it was impossible for the female researchers to work unless they had their spouses' support. However, often, the researcher's schedule was perceived to be more flexible, with the researchers ending up working more hours in total (care responsibilities plus research). Consequently, the induced conflict between the two roles of mother and professional researcher also had an emotional impact on the researchers themselves, with most looking forward to returning to their offices/labs. The female researchers that experienced such limitations with regard to their working conditions at home seemed to agree on how this put an additional burden onto their existing workload, since the working hours had to be extended and adjusted accordingly.

Moreover, additional burdens were experienced by the education researchers we had spoken to, whose working hours were not always flexible, since they needed to be available for meetings and collaborative tasks during that time, even though the conditions experienced at home were challenging during those hours. Although most researchers were perceived by their spouses and housemates as more flexible in terms of working schedule, the researchers did not always have flexibility in terms of working hours. However, because of the complexity of living conditions during the pandemic, their productivity during those hours was affected. For instance, during online meetings, ideally there should have been no more than one person in the same room; this was a challenge for homes that only had one office space or none, with some researchers ending up joining meetings from a common area of the house, while navigating around the activities of the rest of the family members.

Research-specific challenges needed to be overcome as well. For instance, researchers who worked with projects relevant to pedagogy, educational technology, or STEAM had to overcome the lack of flexibility of educational structures in order to be able to collaborate with elementary and high school educators to complete the necessary data collection phases:

> *"...academics and researchers adjusted more easily to virtual teamwork than elementary and high school educators. . ."*. (pedagogy/education researcher)

Even though the conversations included only one male participant, it is interesting to note that from his account of work during the pandemic crisis, in terms of research, the need to leave the home and find an alternative working space was important and was realised as soon as there was flexibility to move back to the office or to work from other spaces suitable for work, such as a cafeteria. On the other hand, most of the female researchers noted that the caretaking obligations of the family were mostly on them during the pandemic, rather than on their male housemates, and thus, they could not move back

to their offices or other working spaces while there were still pandemic-induced restrictions for younger members of the family.

The limitations of flexibility in terms of space for the female researchers, was further corroborated by the male researcher, who added that this lack of pandemic-related flexibility for female researchers seems to continue after the pandemic, inferring that female researchers choose to stay at home after the pandemic:

> *"...remote work has now become an option and our office spaces are nearly empty most of the time (team is mostly made of female researchers)…".* (environmental science and technology researcher)

Out of all the conversations with the 16 researchers, we received testimony from two female researchers who attempted to return to their workspace full time after the restrictions were lifted. The first one, who was the carer in her household, made arrangements to allow her to leave the house to work even during the pandemic. The second researcher attempted to return to the research lab, but this was only temporary because she had managed to set up a more comfortable working space at home. An interesting observation she had made and shared during the conversation was that when she returned to the lab she was only joined by her male colleagues and not the female colleagues.

In both cases, the female colleagues of these two female researchers did not attempt to return to their physical working space before it was required by their employer, even when the restrictions were lifted. The reasons vary, but there was testimony of how some of the researchers had worked on setting up a space in their homes that eventually worked well for them during the pandemic and did not want to change working space again, unless they had to. The home circumstances for the females that looked to return to work as soon as the restrictions were lifted, were more challenging. The flexibility of changing working spaces eventually became yet another burden to overcome for researchers, one that seems to have been more challenging for female researchers overall.

There were also interesting testimonials from two researchers who already worked with an online setup for their research work, and even though they shared homes with their spouses, they had already resolved any scheduling and space conflicts prior to the pandemic. No scheduling conflicts or burdens were reported to occur in this situation during the lockdowns; each spouse had their own space and time to work, and during the day they would not 'meet' as each was busy with their own work or household responsibilities, as per the pre-pandemic schedule. One of the couples did not have to care for children or elderly, and that could have played a role; however, the second couple had to care for a very young child.

It is also interesting to note the input of one female participant, who noted that, although tasks within the household significantly increased, one time-saving change was that she did not have to drive her children to their educational and extracurricular activities. Thus, significantly reducing commuting time for this researcher balanced out the increased time-consuming commitments within the household.

3.2. Lack of Flexibility in Adjusting Expected Outcomes or Outlines

The lack of flexibility was not only discussed in terms of space and schedule, but also in terms of deliverables and project timelines, where, in many instances, the deadlines remained as they were prior to the pandemic with little to no leeway for extensions. Researchers funded by government-affiliated centres or by local Cyprus-based funding bodies testified to such lack of flexibility. The researchers who had to face inflexibility from their employers and funding bodies during the pandemic, struggled with overcoming the many challenges that resulted from this inflexibility. Some challenges included the newly imposed regulations on physical distancing or travelling essential for bringing through a task under a specific project. Therefore, with some of the project tasks, inevitably needing to be rescheduled within the project timeline, the result was that multiple deadlines were accumulating, in anticipation of the pandemic restrictions to be lifted. Lacking sufficient institutional support while having to complete contracted deliverables amidst the pandemic,

the researchers from teams that faced such challenges had only each other's support to resort to, affecting positively the dynamic of the team itself.

In fact, there was a discrepancy reported in terms of the management of project expectations from different funding bodies and affiliated organisations and agencies. Contrary to the situation described above, researchers noted that some funding bodies, like the European Commission in the case of Horizon 2020 projects, were more flexible to negotiate with researchers for alternative arrangements for various projects. For instance, alternative arrangements included modification of data collection approaches, or adapting to travelling restrictions, by finding virtual ways of appropriately completing or replacing tasks that previously required travelling. As an example, a documentary was the main deliverable of a Horizon 2020 project that needed to be adjusted in format and content:

> *"...the large deliverable of the project, was the creation of an ethnographic documentary. This could not be delivered. But even the shorter documentary was not filmed in the way I would have wanted it initially. Certainly, the documentary is reflective of the ongoing situation at the time. Both quality and quantity were affected. Even the subject matter was amended…".* (cultural studies researcher)

In cases where the funding bodies provided the flexibility to renegotiate the research protocols, the projects were completed on time and often with additional findings that resulted from assigning funds, initially committed to travelling, to the research itself. Some of the researchers, however, who dealt mainly with local funding agencies or stakeholders to the project outcomes, agreed that there was a lack of flexibility for the same issues, causing many delays in achieving the project goals:

> *"... there was a need to re-design the project; no possibility of extending the deadlines …".* (cultural studies researcher)

Many of the researchers who participated in the conversations were in the process of data collection when the government measures were imposed. The collections concerned data from different populations, many of whom belonged to a vulnerable category, such as children in the case of an educational technology evaluation project, or elderly participants in a social science project. Even after the lockdowns ended and the main restrictions were lifted, sensitive populations were still protected, such as in schools, where research on school premises continued to be forbidden, or in the case of elderly participants who were unwilling to participate before being fully vaccinated. Consequently, the data collection phases needed to be adjusted, either in terms of method or in terms of time to reach a successful conclusion within the project timelines.

As already discussed, some funding bodies, e.g., the European Commission, were willing to discuss alternative arrangements for data collection with the researchers; however, others were not. In our conversations this observation concerned mainly local funding bodies. Eventually, the funding bodies that were not flexible in the beginning became more flexible as the pandemic progressed and they were willing to accept some adjustments to the research protocols, and specifically to the data collection phase, even though some requirements remained inflexible due to external factors. One such example was the collection of data that by its nature had to be collected from schools during the academic year and could not be left incomplete. In such cases special arrangements and guidelines ensuring respect for safety and physical distancing had to be made to complete the data collection phase on time.

Lastly, additional challenges included research team members becoming unavailable due to being infected and needing to recover. Moreover, strict safety protocols, such as those aiming to minimise the handling of equipment to avoid the spreading of the virus further, added to delays. Some projects were also affected by the travelling restrictions as the researchers could not reach the places where the data collection had to take place, whereas the cancellation of events, including, in one instance, the cancellation of cultural events, affected the data collection phase of projects. In this case, we documented a directly negative impact of the travelling restrictions that affected the project protocol, while previously we

had discussed some of the indirect but positive outcomes that emerged due to the travelling restrictions, as those were identified by the researchers during the conversations.

As the pandemic progressed and restrictions were eased, the lack of flexibility was somewhat alleviated. Nevertheless, some projects were negatively affected in the meantime, even when the added flexibility helped them to eventually complete their deliverables. For example, some projects with less flexible timelines could not afford the time to adapt even when some leeway was given by the funding authorities. Instead, they had to find ways to work during the pandemic, incorporating all the necessary restrictions in their research protocols, e.g., to proceed with special arrangements that respected restrictions such as safety and physical distancing guidelines, even after the lockdowns. However, even though some of the research was adjusted, some tasks had to be terminated:

> *"...it was difficult to find ways to adjust user experience research, especially where virtual reality equipment had to be used…".* (educational technologies researcher)

Additionally, the restrictions on travelling resulted in cancelling physical workshops and conferences. In cases where organisers were flexible in moving the workshop or conference online, these events still took place. Consequently, the number of online workshops and conferences increased, giving the opportunity to even more researchers to attend and disseminate their work, since they could participate in conferences without having to travel, resulting in a significantly lower cost per conference. This was also a positive consequence for the organisers of the conferences:

> *"...a conference and a number of workshops had to be delivered online due to the restrictions. The quality was not adversely affected. They still had a strong impact and were a source for reflection for participants. The expected number of participants attended the workshops. It was easier to attract attention since most people were anyway at home and by that time were used to online delivery…".* (gender equality researcher)

The opportunity to disseminate the work by being able to participate in more conferences was very positive for researchers who worked in projects that quickly adapted to the new research environment, but was not utilised by researchers whose projects experienced continuous delays because of lack of flexibility from their funders at the beginning of the pandemic.

Conversely, many researchers who usually travelled extensively to conferences and summer schools found the time to complete pending research that was based on previously collected data, experiencing a notable increase in research productivity. Two researchers testified that the pandemic was the catalyst that helped them complete their PhD studies successfully. The limitations on travelling imposed by the pandemic, has been identified as a positive catalyst overall, i.e., the limitations resulted in additional time for researchers to spend at home, whether this implied more time spent with family, or more time spent on pending research work that required longer stretches of quiet, focused intervals. Overall, the consensus from the conversations was that the researchers tried to take advantage of the travelling limitations as an opportunity for higher productivity, where possible, or a better work–life balance.

3.3. Inability to Compartmentalise Personal and Professional Life

One of the main challenges for researchers during the pandemic documented by the literature (Cardel et al. 2020, pp. 1366–70; Davis et al. 2022, pp. 436–38; Gao et al. 2021), as well as by the conversations, was the difficulty in navigating work tasks in cases where the researchers had to assume additional caretaker responsibilities. These and other time-consuming commitments were introduced because of pandemic-induced measures, such as supporting their children with online learning during lockdowns and preparing additional meals in the absence of alternative options, such as eating out or take away. In the conversations, we collected evidence that, oftentimes, the burden of such tasks would be assumed by the female spouse or partner.

Often, female researchers took over more responsibility in terms of caring and housework. The consensus across the conversations was that they experienced an increase in household work (cooking, cleaning, shopping), in addition to care responsibilities, because of the increased time spent inside the house.

> *"... from the moment one spends more time at home, there is always more housework that needs to be done ..."*. (pedagogy researcher)

This was not alleviated after the lockdowns were lifted, since there were still guidelines to be followed that usually included decreased travel and commute time, and physical distancing, resulting in the inability or at least in difficulties of outsourcing tasks which would help remove some of these additional burdens from the female researchers.

The resulting condition was mostly fatigue, as testified by the researchers. Moreover, the fatigue increased through a sense of lack of control over the ability to compartmentalise professional work from housework and family responsibilities, meaning the inability to separate these in terms of both time and space. Having to assume all different roles simultaneously, female researchers struggled to complete all tasks, becoming overwhelmed on both fronts. The female researchers who had children emphasised how caring for their children had to become a priority during the pandemic:

> *"...motherhood took the greater percentage of time during the day ..."*. (pedagogy researcher)

Some researchers struggled with the fluidity of their schedule and had to compartmentalise somehow. As discussed by the male participant, he could not follow this imposed fluidity and had to compartmentalise, assuming the initiative to create a schedule and 'book' time every day to achieve some of the scheduled tasks.

The impact on the work, because of the inability to achieve this separation of home and work life, varied depending on the burden this imposed on the researchers. In some cases, the need to move to a different space or have more control over the work schedule was more of a preference that eventually did not affect the work, with project tasks being completed and publications submitted. However, more often this was seen as a significant psychological and physical obstacle that ended up affecting the project work, even in terms of publications.

> *"... There is a need to put more emphasis on the psychological impact of the COVID-19 lockdowns..."*. (pedagogy researcher)

Overall, an important consideration of the post-pandemic era is the psychological impact of the COVID-19 crisis, especially in terms of changes caused abruptly by the induced measures such as the lockdowns and it needs to be considered in any pandemic recovery measures.

4. Discussion

The thematic analysis of notes from the informal conversations revealed that despite encountering challenges related to space and time constraints during the pandemic, alternative schedules and spatial arrangements were implemented without significantly impacting research work. The preservation of research quality was largely upheld throughout this restrictive period. Subsequently, as restrictions were partially lifted reverting to the pre-pandemic arrangements presented another challenge with many female researchers opting not to return despite the apparent flexibility it offered.

Moreover, addressing additional challenges related to inflexible timelines resulted in special arrangements to ensure participant safety, yet research quality remained uncompromised as the anticipated data collection activities proceeded. Regarding adjustments to expected outcomes, the conversations indicated that researchers, when faced with challenges, modified methodologies, and deliverables to mitigate potential negative impacts on research quality. While some cases did result in unavoidable compromises to the quality of deliverables, such as those influenced by travel restrictions, the understanding prevailed

that adaptability in deliverables was necessitated by the ongoing crisis, but with a primary emphasis on preserving scientific quality.

On a positive note, the transition to online platforms facilitated increasing accessibility to conferences for Cyprus-based researchers, allowing the scientific community to disseminate research results without the need for travel. This shift was generally perceived as advantageous as it provided researchers with more time for improved productivity.

To better contextualise the results of the thematic analysis of the conversation data, we move on to discuss the findings in relation to a set of European-wide, quantitative results from the Eurobarometer surveys that were carried out for the European Parliament to investigate the experiences of EU citizens and particularly women during the pandemic. Where appropriate, the Eurobarometer results are reproduced to provide some interesting insights into the European perspective on issues relevant to the findings from the thematic analysis. Given that the Eurobarometer results provide findings per country, the report highlights the Cyprus-specific perspectives, where corresponding quantitative results are available.

Our findings show how the pandemic was challenging for researchers in Cyprus, with its impacts increasingly evident as the pandemic progressed. On the European front, the challenges were documented after the first wave of the virus, in 2020.

The first COVID-19 related European Parliament (EP) Flash Eurobarometer surveyed European citizens on their opinion on different aspects of the pandemic (European Parliament 2020), including research. According to the specific Eurobarometer results, 32% of the respondents at that time had suggested improving cooperation between scientific researchers working across EU member states as one of the top EU priorities (in its response to the coronavirus). The support for research cooperation was highlighted as a necessity since 57% of the respondents were not satisfied with the solidarity between EU member states in fighting the coronavirus pandemic overall (ibid.). The European Parliament surveyed EU citizens after the second and third wave[5] also, with little difference in the overall opinions.

As the pandemic came to an end, it became evident (as expected) that many limitations and challenges faced by researchers, including cooperation, were only temporary. Eventually, the lockdowns ended, the various restrictions were lifted, and researchers could return to data collection, to physical collaborations and overall, to their pre-pandemic work momentum. However, some of the changes that took place during the pandemic were quite impactful, especially on female researchers, and oftentimes, they served as learning opportunities when moving forward.

With the end of the pandemic, travel restrictions were lifted but the time spent on travelling after the pandemic seems to have been reduced. This is partly because of the additional opportunities for collaboration that were discovered and implemented during the pandemic, especially with the increased use of technology and availability of collaborative platforms. Researchers also commented on how travel restrictions forced a lot of conferences to take place online, making many conferences more affordable. Given more opportunities to disseminate their work, many researchers made use of their time to generate more submissions (presentations, abstracts, articles) and virtually present in these conferences. On the other hand, a common observation among more senior researchers serving as editors of journals or publication chairs in conferences, was that even though the number of submissions had increased, the number of reviewers had decreased desperately. Discussion on this matter revealed that many researchers had placed reviewing lower on their list of priorities than it was before the pandemic, with time allocated to wellbeing activities and family and care as a priority. This is a change that appears to have been sustained after the pandemic.

Technology made its way successfully into the scientific process, for instance, with the use of online meeting platforms to complete interviews or focus groups, and other collaborative work tools to complete project deliverables. The increased use of technology appears to be an ongoing change that researchers across different disciplines have experienced and also endorsed.

With enhanced technology support, and more capabilities to work from home, one of the most impactful results of the pandemic for the researchers was the change in the work–life balance. Oftentimes, it is reported that this change happened in such a way that the work–life balance was negatively impacted. The impact on the work–life balance for women in the EU, was investigated as part of the 2022 EP Flash Eurobarometer, with only women EU citizens as respondents. According to the data collected, women in Europe reported that there was indeed a negative impact on their work–life balance, with a severe 68% of women in Cyprus self-reporting this, higher than any other country in Europe. The reported data have been reproduced here in the infographic presented in Figure 2[6] (European Parliament 2022b).

Q5 Do you agree or disagree with the following statements about the COVID-19 pandemic? (% **Total 'Agree'**, by country)

	The pandemichas had a negative impact on my work-life balance	The pandemic had a negative impact on my income	Because of the pandemic's impact on the job market, I could do less paid work than I wanted to (meaning less work for a salary or wage)	Because of the pandemic my professional decisions changed (such as changing jobs)	Because of the increase in work at home, I could do less paid work (for a salary or wage) than I wanted to	Because of the pandemic I'm considering / have decided permanently reducing the amount of time I allocate to paid work
EU27	44	38	31	29	25	21
BE	35	30	25	22	22	21
BG	50	57	40	45	32	22
CZ	39	44	37	26	25	21
DK	29	19	15	19	10	13
DE	46	30	26	23	20	19
EE	35	23	16	21	13	13
IE	42	39	29	42	28	33
EL	59	60	45	47	38	30
ES	36	40	31	25	26	22
FR	39	34	28	29	22	22
HR	46	48	34	35	27	20
IT	52	46	42	29	31	23
CY	68	57	38	49	33	28
LV	43	37	26	29	20	23
LT	45	29	27	29	24	16
LU	56	28	22	45	22	24
HU	51	46	38	28	34	18
MT	58	42	28	38	24	20
NL	45	26	21	27	15	14
AT	48	37	32	31	21	21
PL	42	50	39	38	30	24
PT	52	47	42	33	30	23
RO	48	50	42	37	39	30
SI	47	46	37	35	29	24
SK	44	45	35	30	29	18
FI	36	22	17	16	10	16
SE	35	27	20	28	16	17

Base: Women in employment (n=16 761)

Figure 2. Self-reported negative impact of COVID-19 pandemic on women's work–life balance (European Parliament 2022b).

The impact on work–life balance was one of the negative impacts that resulted from the pandemic induced measures. In addition, according to the EP Flash Eurobarometer (ibid.), women in Cyprus were also severely impacted by changes like working from home and travelling restrictions (especially given the lack of options for an island nation like Cyprus). The EU data shows that indeed these factors affected mental health in Europe, but for Cyprus these two factors were especially impactful. The data are reproduced in Figure 3, and the specific factors are presented in the fifth column and in the seventh column. The self-reported percentages of women in Cyprus show the high impact of these two factors (working from home and not travelling) as compared to the impact of these factors on other European countries.

Q1 Since the beginning of the COVID-19 pandemic, governments have taken various measures to stop the spread of the virus. On a scale from 1 to 5, to what extent did these measures and their effects have a negative impact on your mental health? **(% 'Major impact (scores 4 and 5)' and 'Minor impact (scores 1 and 2)'**, by country)

	Lockdown and curfew measures, limiting your options to shop, go out, go to events, etc.		Limitations in the number of people you could meet at home or visit		Travel restrictions, limiting your options to go abroad		Workplace and office closures and their effects (temporary / forced unemployment, homeworking, etc.)		School and childcare closures and the need for home-schooling / caring for children at home	
	Major impact	Minor impact	Major impact	Minor impact	Major impact	Minor impact	Major impact	Minor impact	Major impact	Minor impact
EU27	41	32	38	35	33	38	28	35	26	34
BE	35	34	42	31	37	34	24	34	23	33
BG	40	35	41	37	39	37	44	33	38	40
CZ	43	35	32	46	25	51	23	50	30	44
DK	29	44	29	42	23	48	16	48	14	43
DE	34	37	36	35	29	38	17	29	19	28
EE	25	47	20	51	23	45	17	46	18	39
IE	40	33	41	33	34	40	22	35	25	28
EL	58	19	43	29	41	31	41	29	33	39
ES	47	25	41	32	34	40	35	33	30	38
FR	44	32	38	33	35	38	22	42	21	39
HR	42	30	37	39	38	37	33	35	31	37
IT	47	27	37	35	37	35	35	32	30	35
CY	54	26	37	36	48	27	40	33	29	40
LV	31	46	32	43	25	48	25	47	25	47
LT	32	45	30	46	29	44	22	48	24	38
LU	40	36	39	40	50	29	23	51	28	45
HU	37	34	33	38	30	38	29	35	27	35
MT	34	42	32	40	44	32	24	43	26	38
NL	34	40	28	44	25	42	21	37	21	27
AT	39	34	37	35	31	40	22	35	22	33
PL	50	26	50	25	42	29	39	26	38	27
PT	45	30	40	35	35	41	39	36	36	38
RO	34	40	38	35	32	38	27	35	29	33
SI	47	32	39	36	39	35	38	35	36	37
SK	41	33	38	32	31	37	26	37	28	33
FI	31	46	26	52	21	57	15	53	14	46
SE	30	39	33	39	29	46	20	44	15	42

Figure 3. Self-reported negative impact of COVID-19 pandemic on women's mental health (European Parliament 2022b).

Several researchers mentioned the opportunity to spend more time with their family and housemates when they shared their living space for more hours of the day, while others, who lived alone, considered the separation from their family and friends as a challenge. The lesson learned was in both cases to try to increase the time spent with family and friends in the post-pandemic era. In terms of work, there were discussions of how often research requires focus and solitude, at least in specific phases of the scientific process, which created an opportunity for additional productivity for those living alone and a challenge for those sharing a working space. The lessons learned were lessons of adaptability in terms of processes and of methodologies. As a result, many researchers made an effort to adapt more permanently to some of the changes that had occurred, especially those that supported flexibility at work for an improved work–life balance.

The COVID-19 related Eurobarometer surveys have confirmed that women have been hit harder by the pandemic, with women being most likely to feel worried about missing friends and family (44%), anxious and stressed (37%), and generally concerned about their future (33%). Moreover, there is a consistent view among women that the measures enacted to stop the spread of the pandemic have had a major impact on their own mental health (ibid.). The case study results have confirmed many of the concerns reported by the Eurobarometer survey results.

> "Women have been hit the hardest by the COVID-19 pandemic. They have been hit mentally and financially. This must stop. The European Parliament is acting to change this." Roberta Metsola, European Parliament (2022a)[7] President.

Moving forward, the lessons learned and overall findings, should inform recommendations that aim to overcome gender disparities, when it comes to professional achievement. For example, many female researchers adopted new work habits, such as working from home, even after the pandemic, as these offered greater flexibility. Organisations should support such flexibility in updated work policies to maintain research productivity in the post-pandemic era. Additionally, opportunities such as online conferences allowed women from smaller research communities, often burdened with family and home obligations, to engage in networking opportunities and enhance research visibility. Moreover, conversations among researchers facilitated discussions about research productivity and challenges, which can lead to the development of strategies that address diverse professional needs. Continuing such dialogues is essential for effectively addressing gender disparities.

5. Conclusions

The COVID-19 pandemic brought the world to a halt, causing changes to our way of life and ways of working in most professional areas. To face this new crisis, global measures were put in place including physical distancing restrictions, lockdowns, quarantines, curfews, use of masks, and so on. To mitigate the effects of these new measures, technology was utilised to enable virtual communication and remote work, which suddenly became 'the new normal' with businesses, universities, labs, clinics, and research centres, many being eager to adopt this mode of work.

This report put together evidence collected from reports and the literature as well as from a set of conversations with Cyprus-based researchers to examine qualitatively how research work has been impacted because of the pandemic crisis and the subsequently imposed measures and policies. Furthermore, the report sought to identify whether gender played a role in the working conditions of the researchers, as well as the extent to which these working conditions prevented the researchers from achieving the required quantity and quality of work.

The study has revealed both positive and challenging changes-temporary and ongoing-resulting from the pandemic's impact on researchers' living and working conditions. For instance, the increased use of technology has been identified by researchers as a positive change, especially researchers who previously did not use technology extensively, and saw it as a blessing in disguise. This is mainly because it forced them to acquire new skills and to save time, for instance by connecting virtually to colleagues or databases. Making use of technology to support a new work–life balance is a change that seems to be persistent even after the pandemic ended. Other positive impacts of the pandemic included less travel and commute for work and/or other responsibilities, e.g., less travel for parents previously driving children to many after school activities, less travel for social gatherings, and less physical work meetings, resulting in more time spent with family and friends.

Conversely, the pandemic imposed additional burdens on researchers who had to:

1. Take on additional responsibilities;
2. Adjust their working hours;
3. Come to new agreements with their funding institutions;
4. Learn to navigate a whole new set of working and living conditions, where often their work was not valued equally within their households which also, in the meantime, had turned into their new working spaces.

Furthermore, evidence showed that the researchers who faced such burdens were mostly female. It seems that in many cases, even if the physical living conditions as well as the working conditions have mostly been adjusted after the end of the pandemic crisis, there are still ongoing issues that need to be addressed in ways that acknowledge gender as a factor of influence. The need to continue addressing these issues in Cyprus, aligns with

the need to address similar issues across Europe, and continue to support women in the post-pandemic era, as they navigate work–life balance challenges.

Overall, this study has expanded upon valuable insights drawn from the experiences of female researchers based in Cyprus amidst the pandemic and it has contributed to understanding the influence of the gender dimension on these experiences. Furthermore, the study has highlighted substantial misconceptions and neglected dynamics pertaining to research undertaken during periods of crisis, offering pathways to safeguard the quality of research in analogous future scenarios.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: No data was recorded as the process of collecting data from participants took place in the form of informal conversations only.

Conflicts of Interest: The authors declare no conflicts of interest.

Notes

1 Specifically, the decision of the Cyprus National Bioethics Committee with reference EEBK ΕΠ 2023.01.67

2 Using observations to search for patterns or themes that can inform an explanation or theory.

3 Using existing theory to develop a hypothesis and testing it through observations.

4 The children of the researchers in these conversations were too young to be left alone during the online classes to navigate the digital environment and needed constant supervision.

5 Reports from all three Eurobarometer results can be accessed here: https://www.gesis.org/en/eurobarometer-data-service/survey-series/european-parliament-covid-19-surveys (accessed on 27 January 2023).

6 Figure 2 is reproduced from the Eurobarometer report and contains additional data; the reported percentages on the work–life balance are presented in the first column.

7 From European Parliament News: New Eurobarometer survey highlights severe impact of COVID-19 pandemic on women | News | European Parliament (europa.eu): https://www.europarl.europa.eu/news/en/press-room/20220223IPR23904/new-eurobarometer-survey-highlights-severe-impact-of-covid-19-pandemic-on-women (accessed on 27 January 2023).

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