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Bridging The Digital Divide: Methodological Strategies For Conducting Remote Urban Research

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Abstract

This article examines methodological approaches for conducting community-engaged research remotely with participants who have limited internet access. Community-based urban research must include the voices of all stakeholders to ensure representation and equitable decision-making. The digital divide, characterized by varying levels of digital literacy and limited access to technology, often excludes disadvantaged stakeholder groups from remote data collection. While extensive studies have been conducted on both analog and digital data collection methods, few have focused on adapting these approaches to include digitally marginalized groups in architecture and urban studies.

This article reflects on data collection adaptations made to bridge the digital divide in a project that was designed before, but conducted during, the COVID-19 pandemic, between November 2020 and May 2021. Grounded in a mixed-income, informally developed settlement in India, the study aimed to examine how residents in informal settlements met their social and recreational needs.

The pandemic lockdowns made on-site data collection infeasible, prompting the research to be adapted for remote implementation using a mixed-methods approach tailored to participants' levels of digital literacy and access. Multiple strategies were employed to collect representative data and ensure data validity, including online and telephone-based surveys, telephone interviews, and participant-generated visual data. Residents with phone and internet access were employed as intermediaries to help navigate trust and accessibility challenges and to recruit participants without digital access. In addition to presenting the study's remote data collection methods, this article also identifies ethical challenges that may arise when using intermediaries to bridge the digital divide in qualitative research where the researcher is not physically present.

Keywords: qualitative research methods; urban studies; digital divide; informal settlements; community-engaged research.

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INTRODUCTION

Researchers draw on community-engaged research methods across social science, architecture, urban planning, and policymaking. Traditionally, both analog and digital data collection tools have been used in theory building and planning decisions. However, the 2020 COVID-19 pandemic led to widespread, multistage lockdowns and travel restrictions, delaying research activities and necessitating adaptations in research methods, particularly in community-engaged projects. During this period, the constraints of remote research became apparent, highlighting a gap in inclusive engagement, especially when working with underprivileged and digitally marginalized communities.

Informal settlements housing low-income residents are an urban reality in many cities of the Global South. Much of the existing literature on informal urbanism has focused on encroachments such as "squatter" settlements, which consist of temporary structures, or slum settlements, which often involve more permanent structures. Recent research has increasingly examined informal practices among middle-class and wealthier communities across cities in the Global South (e.g., Bartels 2020; Martínez 2021). These communities often build housing on land they own, but their residential developments violate land-use zoning defined through master plans or the building regulations set by municipalities.

This study required data collection in informally developed settlements in Delhi and was part of a larger research project undertaken in 2020–21. The COVID-19 pandemic, which precipitated lockdowns and travel restrictions shortly before in-person research was to start, required me to shift to a remote data collection plan on short notice. I quickly realized that community-engaged research in Delhi's mixed-income informal communities would pose challenges, as residents with varying levels of digital literacy and technology access would be difficult to reach through remote means.

Although digital tools have made significant inroads in data collection, such tools work best when all participants have the means and the technical know-how to use them. Studies have highlighted the benefits of digital data collection tools, including faster and cost-effective data collection, often eliminating travel-related costs and offering convenient features such as screen sharing, recording, and transcription. Digital tools also facilitate broader researcher collaborations and access to larger participant pools (Creswell and Poth 2018; Rahman et al. 2021; Keen et al. 2022).

I found a critical gap, however, in the understanding of how to accrue such advantages when engaging with communities with limited digital means. Few studies have explored strategies to navigate the divide between technologically savvy and technologically inexperienced research participants, especially when conducting community-engaged research (e.g., Lathen and Laestadius 2021). This study addresses this gap by reflecting on how remote data collection works and how to adapt processes to reach populations with limited digital access.

THE COVID-19 PANDEMIC AND QUALITATIVE RESEARCH ADAPTATIONS

The digital divide is a challenge for representative data collection that was exacerbated during the COVID-19 pandemic (Lathen and Laestadius 2021; Kroese et al. 2021). Even prepandemic and postpandemic, the exclusion of groups with limited access to digital devices and digital literacy risked a lack of representative data collection and, with it, skewed data. Worse still, the exclusion of community groups based on researchers' limited access to participants and the community's ability to participate in digital data collection has been shown to result in worsening inequity in decision-making and increased social inequalities (Lathen and Laestadius 2021).

In community-engaged studies, the most common form of data collection remains face-to-face interviews conducted by researchers with selected participants. These can range from structured or semi-structured interviews to unstructured conversations with individuals or focus groups to capture participant insights on specific topics. Other forms of analog (i.e., non-digital and non-remote) data collection include workshops, oral history, and go-along methods (Maharawal and McElroy 2018; Sun and Lau 2021). Go-along methods, especially, capture participants' experiences in their natural settings, using interview cues from their immediate environment as they go through their everyday routines. Other analog data collection methods include printed surveys filled out by participants and journaling, where participants maintain a written record of a specific topic and share it with the researcher. Written methods are commonly followed up by interviews.

Participant involvement in the data collection process varies depending on the research design. Some researchers use nonparticipatory methods, such as observing social and spatial practices, or mapping events or cues physically visible to the researcher. By contrast, methods such as journals and photovoice engage participants directly by having them document their own experiences through notes or photographs, which are later shared with the researcher (e.g., Liegghio and Caragata 2020). Other approaches involve

sharing photographs in person or through online forms and asking participants to reflect on them, providing insights into their perceptions of a space or study subject (e.g., Ahrar 2018). This approach aligns with the technique of photo elicitation, where the researcher presents the participant with a preselected photograph and asks them to share their thoughts on it (Creswell and Poth 2018).

With mobile phones and the internet becoming widespread globally, researchers increasingly use digital methods such as online surveys and virtual interviews conducted individually or in focus group settings. These require participants to have access to a telephone or mobile phone for phone-based interviews, a device with an internet connection, and access to a private space where participants can comfortably respond to researchers' questions away from family or peers in the case of video call interviews through videoconferencing platforms (Lobe et al. 2020; Lathen and Laestadius 2021). Some researchers have used messaging applications to conduct discussions with participants (e.g., Dube 2020). Other digital data collection approaches include social media analyses (e.g., Yigitcanlar et al. 2020) and digital mapping, which allows data collection with less direct participant engagement (e.g., Engelbrecht and Jordaan 2024).

While these digital methods have significantly reduced the time and cost associated with analog methods, concerns about digital inequalities persist, making it harder to access marginalized groups and resulting in underrepresentation or exclusion (Tomczyk et al. 2019; Rahman et al. 2021; Kroese et al. 2021; Keen et al. 2022).

Marginalized groups in data collection include low-income households with no electronic devices or a device shared among the household, women in households where phones are owned only by men, children without phone access, families lacking internet access, people with medical challenges, and those with limited digital literacy (Hall et al. 2021). Vulnerable communities such as slum residents, refugees, and victims of crime may fear data misuse, given a lack of trust-building opportunities through in-person interactions with researchers. Moreover, distrust in online systems among older adults has been found to result in a lack of motivation to share data through web-based surveys and other digital systems (Tomczyk et al. 2019).

While data collection in controlled environments remained possible during the pandemic through social distancing and masking, conducting research such as walk-along and household interviews in naturalistic settings became challenging due to safety concerns and travel restrictions (Lobe et al. 2020). As a result, researchers shifted to digital methods to ensure the timely completion of their projects, carefully considering the benefits and drawbacks of digital qualitative research (e.g., Liegghio and Caragata 2020; Rahman et al. 2021). To support this transition, many institutions and researchers published guides and resources to facilitate qualitative research during the pandemic (e.g., Lobe et al. 2020; Garcia and Barclay 2020). Researchers also published crowdsourced collections of guidance and resources on conducting research during the pandemic (e.g., Lupton 2021) or published reviews on ongoing research adaptations in response to the pandemic (Hall et al. 2021).

ETHICAL CONSIDERATIONS IN DIGITAL RESEARCH

Ethical considerations are crucial in qualitative research, with issues arising at various stages, including recruitment and data collection. Traditional ethical considerations include ensuring that participants understand the study's intent, being sensitive to participants' culture and living conditions, respecting the research site, avoiding power imbalances during data collection, and protecting participants' privacy (Creswell and Poth 2018).

Digital data collection methods present additional ethical challenges. Researchers may find it difficult to protect participants' privacy in virtual settings, and mediators organizing these discussions can unintentionally create power imbalances (Lobe et al. 2020). Privacy concerns persist even when precautions are taken. For example, in focus group discussions conducted on messaging apps like WhatsApp, researchers may use pseudonyms (Dube 2020). However, participants still have access to each other's phone numbers, compromising anonymity, as online tools may allow users to identify individuals using their phone numbers. During digital data collection in group settings such as messaging applications and video calls, participants may not participate throughout the conversation because they are distracted or experience technical issues. They may be shy in engaging unless directly asked to respond, resulting in more outgoing respondents overshadowing other participants.

Such challenges raise concerns about researchers' ethical responsibility toward participants and data reliability issues. Careful consideration is required when selecting digital methods to ensure that the platforms used for participant interactions provide privacy, maintain anonymity, and protect participant data. Researchers must also advise participants on safeguarding their privacy by using virtual backgrounds during videoconferencing or adjusting settings in messaging applications to hide their names before group discussions (Lobe et al. 2020).

Beyond ethical considerations, conducting research digitally with communities also poses logistical challenges. During the COVID-19 pandemic, researchers reported issues with disengaged or distracted participants during virtual interviews and focus groups, including missed appointments and connectivity disruptions that affected data collection (Rahman et al. 2021; Kroese et al. 2021). Participants were often not as focused during virtual interviews as they would be in person, leading to disengagement where participants multitasked, for example, doing household chores or pursuing familial duties, running errands, or commuting (Lathen and Laestadius 2021; Rahman et al. 2021). This resulted in researchers finding it more challenging to build rapport and trust during both the recruitment and interview phases (Rahman et al. 2021).

Some researchers found that rapport could successfully be built over digital platforms (e.g., Archibald et al. 2019; Lathen and Laestadius 2021; Keen et al. 2022). Few even noted that digital platforms allowed more flexible scheduling and improved recruitment effectiveness compared to in-person interviews (e.g., Keen et al. 2022). Researchers have noted various challenges despite these benefits, such as a lack of commitment to virtual appointments (Rahman et al. 2021). Internet connectivity issues frequently disrupted interviews, focus groups, and workshops, especially when engaging vulnerable populations (Dube 2020; Lathen and Laestadius 2021; Rahman et al. 2021). Other issues, especially when contacting marginalized communities, included technical problems with their devices not supporting video calls, microphones or cameras not functioning properly, or having poor audio or video quality (Lobe et al. 2020).

Community-engaged research relies on access to participants and trust-building, which is hard to achieve through digital means (Hall et al. 2021). To overcome such a digital divide during the pandemic, researchers, particularly those in academic settings, documented their and others' methodological adaptations to ensure research continuity even with travel restrictions and limited access to communities (e.g., Weinstein 2021; Rahman et al. 2021; Hall et al. 2021). Such methodological adaptations present an opportunity to learn from and inform community-engagement practices that rely on digital means (Hall et al. 2021).

During the COVID-19 pandemic, several funding agencies required researchers to provide contingency plans for conducting research with pandemic restrictions. This planning was necessary to ensure that researchers considered adaptability when designing the study. Even post-pandemic, researchers have begun to recognize the need to be proactive and create adaptable and flexible studies to respond to challenges that may emerge during the data collection process (Rahman et al. 2021). Researchers have stressed the importance of assessing the impact of conducting qualitative research digitally. They have also evaluated researchers' ability to adapt their research in response to crises, such as the pandemic while maintaining consistency and project time commitments (Rahman et al. 2021).

Researchers have used digital recruitment strategies such as social media advertisements to reach potential participants. To encourage participation, incentives are often offered, including gift cards for completing data collection, prize draws for online survey completion, and refreshments provided during in-person data collection (Lathen and Laestadius 2021).Previous studies have used "gatekeepers" and community intermediaries to recruit participants, inform them about the study's purpose, and safeguard their rights to participate or withdraw at any stage, thereby facilitating digital data collection (e.g., Rahman et al. 2021; Roberts et al. 2021). In qualitative community-engaged research, such intermediaries are crucial for gaining access to communities, especially among vulnerable groups such as economically disadvantaged individuals, low-income women, victims of crime, and older adults (McAreavey and Das 2013; Creswell and Poth 2018; Lathen and Laestadius 2021). Using gatekeepers in participant recruitment and data collection has benefits, but also ethical challenges. While gatekeepers can facilitate faster access and build trust with otherwise difficult-to-reach groups, they may also introduce ethical concerns related to coercion during recruitment, unbalanced representation based on their biases and hidden agendas, and potential influence over participant responses, thereby affecting the reliability of data collection (McAreavey and Das 2013; Bashir 2023).

Studies have examined selection bias and representation issues associated with recruitment through gatekeeper assistance, nonprobability sampling methods such as snowball sampling, and digital recruitment channels (e.g., Atkinson and Flint 2001; Oppong 2013). To ensure that recruited participants understand the risks involved, the voluntary nature of their participation, and the purpose of the study, the researcher should provide this information before the interview in both written and verbal formats (Bashir 2023).

Concerns remain about identifying and recruiting a sufficiently diverse initial group of participants to initiate chain-referral sampling in snowball recruitment, ensuring the representation of different subgroups in a heterogeneous study population (Atkinson and Flint 2001). Researchers have used multiple entry points to enhance participant heterogeneity and address selection and gatekeeper bias when studying hard-to-access communities (Sulaiman-Hill and Thompson

2011; McAreavey and Das 2013).

CONDUCTING REMOTE RESEARCH DURING THE COVID-19 PANDEMIC: A CASE STUDY

During the COVID-19 pandemic, I conducted research in Delhi, India, to examine how different socio-economic groups access and use spaces for leisure. This research, planned before the pandemic, aimed to help understand community needs in a rapidly developing urban center in the Global South. The areas studied were three informally developed mixed-income neighborhoods. I aimed to identify the types of spaces used for social interaction and recreation by residents of these settlements, which largely lacked formally developed recreational spaces such as parks.

The study was initially designed to take place in two phases. The first phase, which served as a pilot study, included nonparticipant observations, and mapping of people's interactions in public spaces, as well as noting the spatial characteristics of these activities. The second phase included data collection through community-engaged methods such as interviews with identified stakeholders and a photovoice exercise with residents. I planned to provide instant cameras to residents, who would document spaces they used to meet their social and recreational needs. The photovoice exercise with single-use cameras was intended to ensure participation by residents without access to digital cameras or phones.

During the primary fieldwork in February 2020 (before the COVID-19 pandemic), data was collected in Nai Basti, Abul Fazal Enclave, and Shaheen Bagh to document the settlement periphery, prominent edges, nodes, and the function of internal streets. Observations and behavioral mapping exercises allowed me to identify various stakeholder groups that use public spaces in this informally developed mixed-income settlement. The settlement is considered mixed-income due to its resident population, which includes working-class individuals (such as drivers and household help), white-collar workers (such as teachers and engineers), and small- to medium-scale business owners.

After the onset of the COVID-19 pandemic made further in-person research impossible, the heterogeneity of this informally developed settlement created a considerable challenge. Delhi experienced several lockdowns beginning in March 2020, making follow-up fieldwork with face-to-face data collection infeasible. A photovoice exercise was also not possible, as cameras could not be delivered to participants. Delhi's pandemic lockdowns also altered the way of living and the use of public space, which also impacted the study objectives. At this stage, there was no way to know when the pandemic would end, or lockdowns would be lifted, as they were reinstated by the government every time COVID-19 cases increased. This necessitated adapting the research design to conduct the qualitative study remotely.

Previous work in the community had established neighborhood contacts, providing me with access to a diverse pool of participants from various demographics, which facilitated the initial recruitment of study participants. The study objectives were then altered to capture not only how diverse residents of mixed-income informal settlements in Delhi use spaces within and around the settlements to meet their recreational and social needs, but also how they did so during the pandemic.

This shift in the research questions helped capture the experiences of people who were in lockdown, as well as those who were going out while maintaining social distancing in a dense city context. It provided an opportunity to capture information about how residents navigated lockdown challenges, what they did in their leisure time, and how this corresponded to amenities (such as courtyard spaces or private balconies) they had access to. Studying how leisure activities shifted for various groups during the pandemic lockdowns aligned with a later report that suggested adapting studies in times of crisis (such as the COVID-19 pandemic) to "examine related issues to provide new insights in the context of [such crises]" (Rahman et al. 2021, 9).

Conducting Surveys Remotely

I began by using nonparticipant field observations and photographic urban analyses to review how different groups had used public spaces pre-pandemic, as documented during the pilot study. This review allowed me to categorize user groups and their activities along major transit nodes, the site's periphery, and commercial and residential streets. Having established types of users in the public spaces within and on the periphery of the case study site, I validated this categorization by reviewing existing literature on unauthorized colonies in Delhi that were grounded in the same or adjacent case study sites.

The identified user groups included residents of the case study site; individuals working for these residents such as maids, drivers, and guards; as well as workers in residential buildings, businesses, retail shops, automobile workshops, and other institutions located in the neighborhood. The site's population was thus broadly categorized into middle-class and working-class groups for this study. From previous experience in the area, I knew that working-class residents (maids, drivers, general employees, and informal vendors) were much less likely to have digital access than the site's middle-

class residents (white-collar workers, professionals, and shop owners).

Three main challenges were identified for the new study: accessing a diverse demographic to ensure multiple perspectives, building trust remotely, and the concern that digital surveys could exclude entire demographic groups that lacked either the access or the knowledge to complete online questionnaires. To overcome these challenges, the next step was to develop strategies for accessing these groups remotely.

Identifying and Recruiting Study Participants

Having determined two broad user groups with presumably different levels of digital access, my next step was to identify ways to access these groups for data collection. Through contacts from a previous study conducted in the same neighborhood, I generated an initial subject pool, as phone number databases do not exist for this area. I then used a "snowball" method, asking initial contacts for additional names, to develop a further pool of participants for interviews and surveys. I approached this step cautiously and advised initial contacts to suggest participants representing a broad range of educational backgrounds and employment types. I then contacted the suggested participants via phone, asking screening questions to ensure a diverse pool. Initial interviews were conducted with this pool, and participants were asked to suggest others in their social circles or acquaintances, focusing on

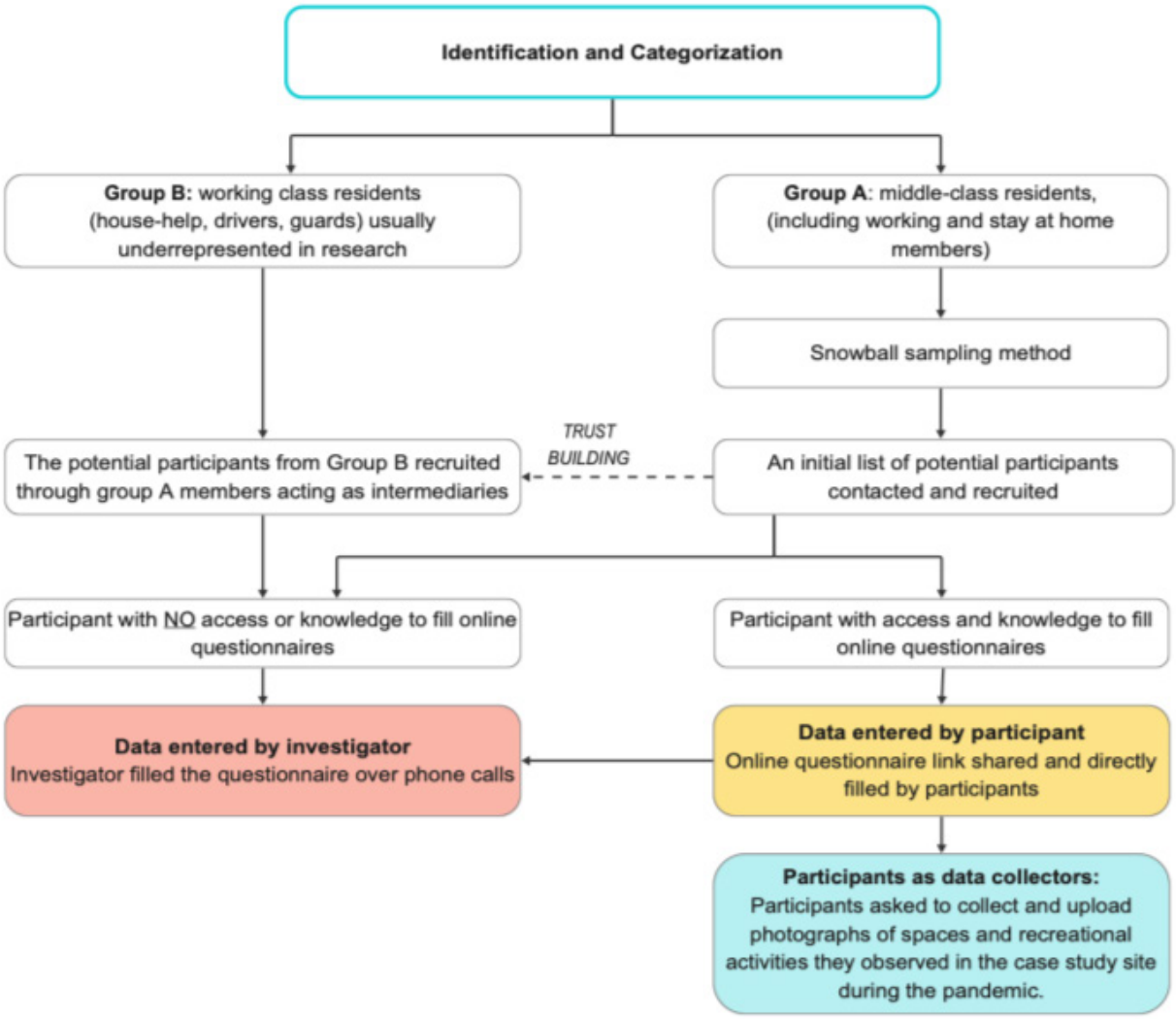

Figure 1. Identification of Participants and Data Collection

underrepresented demographics such as age, gender, and occupation that were not reached through the initial participants. The snowball technique has been successfully used by other researchers for remote recruitment (e.g., Dube 2020).

I then conducted unstructured and semi-structured interviews with the participants. Based on these initial interviews, the data collection instrument was revised. Initially, the questionnaire was designed to be distributed as print copies. These were later modified, and online surveys were conducted using a web-based tool, Qualtrics. The surveys included three question formats: text entry for open-ended questions, multiple-choice questions, and matrix table–style questions.

Recruiting working-class residents was challenging. User groups on the periphery of the informally developed settlements were often not residents but people employed within the study site, spending ten to twelve hours daily in the settlement and using its open spaces to linger, relax, and socialize during their free time. This group proved difficult to access remotely. Even the middle-class study participants had few connections with the settlement's working-class residents, such as those employed in non-residential businesses in the case study site. I soon realized that the middle class frequently interacted with this group, which included maids, drivers, and security guards. For this reason, I sought the help of the middle-class group to recruit potential working-class participants they interacted with regularly.

Using middle-class residents, who largely had cell phones and internet access, to recruit working-class residents, who often could not be reached through cell phones or the internet, served as a breakthrough in finding participants that represented all demographics of the study area. I maintained caution and advised the middle-class residents to inform others about the study without attempting to persuade or coerce them into participating. In this manner, I attempted to mitigate the potential power discrepancy between middle-class residents and the people they employed or who otherwise served them.

Flexible Data Recording

Gaining access to diverse demographics for both interviews and surveys was also a challenge. To address this, I categorized the identified participants into two groups: those without internet access (and thus usually lacking the knowledge to use electronic devices for online surveys.) and those with such access. This strategy allowed for more targeted efforts to include the data of groups without digital access. The use of flexible means of data recording ensured inclusion of groups that might otherwise have been overlooked.

Participants with access and knowledge completed online questionnaires directly. For those who did not have access or knowledge, I used phone calls to conduct interviews and fill out the questionnaire. In some cases, as with working-class survey participants, one phone was often shared among multiple family members. Having accessed phone numbers of working-class residents through the "snowballing" sampling technique, I was able to use this connection to interview one or several family members, filling out questionnaires based on their verbal answers. I recorded follow-up questions separately after completing the questionnaire on the participant's behalf. This interactive, one-on-one structure provided greater insights, as follow-up questions were possible.

I ensured that simple language was used in the forms to prevent misunderstandings. Context-specific words were carefully chosen to reduce confusion. For example, "housewife" was used instead of "homemaker," as the latter term would be unfamiliar to many survey participants. The survey form also included questions on activities and space use before and during the pandemic, to capture responses on lifestyle changes and constraints experienced by different demographics.

Seventy percent of the pilot study respondents had used mobile phones to complete the survey. Based on this, I edited the forms used and introduced a survey feature that skips irrelevant questions based on previous answers, reducing the time participants spent responding to the survey.

After a series of pandemic lockdowns, potential participants' willingness to engage in the study began to increase by January 2021. Participants expressed a need to communicate with people outside their immediate circles and were willing to dedicate more time to interviews. They shared details about how various spaces in the informal settlement were used before the COVID-19 pandemic, their own activities and those of people around them during the pandemic, and their recreational needs.

As the pandemic lockdowns continued, response rates from older adults and stay-at-home parents increased. Initially, I found it challenging to engage these demographics due to hesitancy in sharing information or a lack of available time. As pandemic isolation increased, participants expressed comfort in having someone to talk to. Being isolated all day and unable to go out, they provided insights for the study through their extensive narratives. While this resulted in longer hours of data collection, it yielded more in-depth data.

Participants were candid in their descriptions of spatial

practices, daily routines, and changes noticed during the pandemic. In some phone calls, they included their family members or neighbors to respond to questions. These conversations allowed me to better understand participants' lives and social interactions during the pandemic. This highlighted the conditions of these participants, who were usually not as easily reached and were often confined to their spaces with the same people day after day, seeking a change from their daily monotony and constant pandemic-related worries. In these interviews, I also experienced the issue of interviewees veering off-topic to discuss what they were most interested in, which Creswell and Baez (2021, 56) refer to as participants bringing up "pet topics."

Ultimately, providing multiple data entry options based on digital literacy and technology access ensured that the experiences and perspectives of varied demographics were recorded. This flexible data recording strategy proved effective for the study.

Participants Collect Visual Data

During the COVID-19 pandemic lockdowns, I also asked participants to collect and share visual data in the form of photographs of their recreational spaces and activities. This data revealed the types of recreational activities participants undertook during the lockdown and how these activities shifted to semi-private spaces accessible to residents, such as grounds within institutional complexes. The photographs and interviews with residents showed how rooftops and balconies served as places for social interaction with neighbors due to the high volume of people using these spaces to step out of the enclosed walls in the high-density neighborhood.

Photographs and descriptions shared by participants also revealed areas researchers might have overlooked as recreational spaces for investigation, such as religious complex grounds or school playgrounds (used by adults). These spaces were used as venues for recreation and social interaction. Participants shared photographs of themselves sitting together after walking in a mosque complex, as well as photos of both women and men playing badminton in the same mosque complex.

The activities shared were notable for two reasons: First, the women noted that the mosque areas they occupied were typically maledominated, as women in the neighborhood tend to pray at home, with only a few using the mosque's designated women's areas. So, women using the mosque's spaces for recreation during the pandemic emerged as an exciting finding. Second, the social exchanges across balconies and rooftops described by residents highlighted the various levels at which exchanges occurred. Perhaps due to the scarcity or limited availability of public spaces intended for recreation, such as parks and community centers, residents sought ways to find community while maintaining social distancing requirements mandated by the lockdowns.

Using visual data shared by the residents proved extremely useful for this study, as observations in urban and informal settlements (such as the one in this case study) are typically limited to open spaces that are publicly accessible and visible. Gaining visual access to privately controlled or restricted areas is more difficult in conventional research. Without such access, however, researchers may remain unaware of activities taking place in semi-private spaces, such as the rooftops of apartment complexes.

CONCLUSIONS

Qualitative researchers go through a range of experiences while conducting a study. The process of recruiting participants and transcribing and interpreting data is often perceived by researchers as isolating (Creswell and Baez 2021). This case study showed the importance of reexamining the researcher's position and experiences in these processes. The COVID-19 pandemic and lockdowns required researchers to re-structure recruitment and data-collection strategies, methods that have remained useful for accessing demographics often overlooked in such studies. While having access to and knowledge of digital devices can facilitate data collection, more challenges arise when studying marginalized communities or demographics, such as low-income residents or older adults who may not be familiar with using digital devices or software for video conferencing and online surveys. Individuals in underprivileged communities, especially, may have no mobile phones or may experience difficulties using electronic devices or accessing the internet. The absence of technical assistance can result in less participation by those dependent on third parties to engage in the digital process.

This study utilized three main strategies to overcome digital research challenges. First, it used intermediaries and a "snowball" recruitment method to find participants from demographic groups who were harder to reach remotely. Second, it used flexible data recording methods to bridge the digital divide, allowing for better inclusion of digitally marginalized groups. Third, it used participants as visual data collectors to gain access to spaces normally closed to outsiders. The three measures, taken together, provided an enhanced means to remotely collect data about spatial use in urban sites physically closed to the researcher. Triggered by the pandemic lockdowns, the revised research plan even allowed for more comprehensive data than initially planned for, truly a silver lining in the distressing

situation caused by the pandemic itself.

Based on this research, I identified a range of challenges and ethical implications in the study design itself. For instance, relying on participants during remote data collection projects means that researchers must rely on the participant's accurate description of an event or triangulate data by requesting further detail or corroboration. In this study, the images shared by participants depicted activities involving a diverse range of social groups. In future studies, researchers must similarly remain mindful that relying solely on photos as a data source may amplify the voices of digitally savvy participants while marginalizing those with limited digital access.

A further challenge of digital recruitment and data collection is the time required. Using intermediaries

Study Aspect	**Ethical Concerns Identified**	**Possible Ways to Address These Ethical Challenges**
Use of Intermediaries	There is potential for power dynamics and coercion, particularly when intermediaries recruit participants who are either employed by them or are from within their community.	Familiarize intermediaries with ethical practices in the recruitment process and oversee their activities by asking questions about the recruitment process and reiterating ethical considerations. Be mindful of potential power dynamics in participant recruitment and data collection.
	Lack of direct interaction with the community while recruiting to confirm the consent process.	Set clear guidelines that intermediaries need to follow while recruiting participants for a study, emphasizing that participation must be voluntary. Clearly explain the purpose of the study to participants at the beginning of the interview and obtain their verbal consent and, if possible, their written consent for participation.
Participants as Data Collectors	Privacy concerns about sharing photographs and other personal data of the participant or those around them.	Ensure participants understand the purpose of the data collection and the associated risks.
		Brief participants on the type of data acceptable and the way the data will be used (e.g., publication).
Flexible Data Recording	Challenges around the accuracy of data collected through different media (e.g., self-administered surveys vs. telephone-based surveys).	Use standardized questions and conduct pilot surveys across both formats. Also, ensure the language in the data collection instrument is simple and easy to understand.
		Validate data through interviews or other follow-up techniques.
	Time-consuming process to recruit and collect data through more than one medium.	Set a clear timeframe for each step of data collection and evaluate the research design at various stages.

for individual recruitment of further participants and setting up phone interviews across different time zones can be tedious. When using the snowball recruitment method, ethical concerns should be addressed within the recruitment stage itself. For instance, researchers should ensure that employers who are asked by their employees to participate in a study do so without coercion. Employee responses might be influenced if an employer is in the same room or within earshot during data collection. So, the researcher needs to provide clear instructions to the intermediary about the purpose of the study and the importance of privacy when interviews take place.

Researchers must be mindful of the power dynamics that risk biasing responses and potentially bias the data. This is especially true in remote international research, where recruiters may see themselves as "gatekeepers" who control access to specific community members, and researchers may have a limited understanding of the site context and cultural systems due to their absence from the field.

In this study, as I already had multiple contacts on-site, I used multiple entry points into the community to recruit participants. This mitigated the risk of sampling bias and ensured representation across a wide range of occupational affiliations noted on-site during the initial field visit. This approach may not always be feasible for remote research. Researchers must identify strategies to address sampling biases and prevent gatekeepers from dominating the recruitment process while upholding ethical considerations such as consent, representation, privacy invasion, and coercion (McAreavey and Das 2013).

Researchers must clearly explain the study's purpose to participants at the beginning of the interview and obtain both verbal and written consent, reiterating that participation is voluntary and that they may withdraw at any time (Bashir 2023). Explaining the purpose of the study is especially important when conducting research remotely. During the study, I sensed that participants sometimes tried to answer what they felt was the "right" thing to say, especially in the presence of a person known to them. This may compromise the reliability of the data collected. It is thus essential to address such issues before they arise.

The table below summarizes the challenges and considerations noted in this study.

Researchers can apply these strategies to bridge the digital divide in community-engaged research and address challenges in settings with limited digital accessibility. As remote tools and methods continue to be used to engage with communities across the globe, these approaches can help ensure greater inclusivity in research. As research methods evolve, ethical considerations around equitable participation will remain essential.

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