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Use of WhatsApp® aplicattion in health manegement, work, and care in fighting the COVID-19 pandemic

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Abstract *This study aims to analyze the use of the WhatsApp® application in health management, work process, and care in coping with the COVID-19 pandemic. A qualitative research was carried out by multiple case studies with semi-structured interviews with SUS managers and workers from May to November 2022. The material was transcribed and processed on ATLAS.ti® and its thematic content was analyzed. The use of WhatsApp® enhanced processes that created new health management, work, and care practices from a lively, communicative perspective produced in actions especially based on the challenges brought to face the pandemic. Results also point to the overcomplication of workers and managers, sometimes configuring situations of exhaustion due to constant and full-time communication in the application and the potential compromise to their health. They also highlight practices that had been informally produced and that emerged as an accelerated process of non-formal institutionalization in response to the practical demands of the health emergency, constituting new communication and access regulation arrangements.*
Key words *COVID-19, Medical Informatics, Health Management, Comprehensive Health Care, Qualitative Research*

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Introduction

COVID-19 is an infection caused by the SARS-CoV-2 coronavirus, first identified in December 2019 in Hubei Province, China[1]. In March 2020, the World Health Organization designated it a pandemic due to its rapid spread among humans and across several countries[2]. Facing the global health crisis has brought new challenges, requiring resilience and plasticity from health systems[3,4] and the formulation of heterogeneous government responses[5], especially in the Unified Health System (SUS) in Brazil[6]. The limitations due to social isolation measures and the need to meet a growing and unknown demand required transformations in health practices during the pandemic.

The restriction of in-person activities and personal contacts has enhanced communication by digital technologies, which, although already in use, have emerged in the context of the crisis as part of the solution. The use of these technologies effectively increased the scope of health care with management, assistance, teaching, and research actions, and is recommended to expand the supply of services related to health care[7].

Among the many possible digital communication tools, WhatsApp® stands out: an application used in mobile telephone services (cell phones) that supports sending and receiving a variety of media: texts, photos, videos, documents, locations, and voice calls[8]. Brazilian healthcare providers preponderantly used this application as a digital communication technology during the COVID-19 pandemic[9]. Thus, some questions emerge: How have new digital communication technologies, especially WhatsApp®, been used in the context of the pandemic? What innovations and arrangements have been enhanced? What are its visible challenges? This study aims to analyze the use of WhatsApp® in health management, work process, and care during the COVID-19 pandemic.

Methods

This study was produced from research that was conducted to analyze the productions, inventions, and challenges in care management implemented by health care networks in two Health Regions in the State of São Paulo to face the COVID-19 pandemic.

This is a qualitative multiple case study. According to Correia[10], the approach of comprehensive and phenomenological epistemology takes place in a methodological articulation that can associate the objective conditions of a context to the individual production of action meaning. This research accessed the immediate pre-reflective experience of health managers and workers to describe and understand its meanings. The multiple case study method involves more than a single case and can provide a more robust study by using multiple sources of evidence, stressing, rather than the potential for generalization, its understanding, which is strongly linked to intentionality and amplification of experience[11].

The field of study consisted of two health regions that were chosen from the results of the first stage of the "mother survey", one in inner São Paulo State (Inner Health Region - IHR) and another in the Metropolitan Region of Greater São Paulo (Metropolitan Health Region - MHR). The selection criterion was chosen based on the perception of the relevance, originality, and preliminary results of the experiences of these health regions in the previous phase of the investigation. In each region, three municipalities were selected based on the same population criterion: small (SZM), medium (MSM), and large (LSM), duly characterized in Chart 1.

Semi-structured interviews were conducted with SUS managers, health service coordinators, and workers (Chart 2) from May to November 2022, addressing issues related to the health management, assistance, surveillance, and care of populations in vulnerable conditions in the context of the COVID-19 pandemic. The interviews were conducted 1) in the first stage, "top management" at the Municipal Health Secretariats and the Regional Departments of the State Health Secretariat were interviewed; 2) in a second phase, coordinators, managers, and workers from health sectors and services who were identified and indicated by former participants following the "snowball" method[12]. According to Poupart[13], qualitative interviews are an effective tool to collect information about the structures and functioning of a group, institution, or social formation and a privileged instrument for exploring the experience of social actors. In total, 29 interviews were conducted, 14 individual and 15 groups ones, totaling 58 interviewees accessed at their workplaces, who were recorded after participants accepted and signed an informed consent form that guaranteed confidentiality and anonymity.

The material was transcribed and processed on ATLAS.ti® by thematic content analysis, and

Chart 1. General characteristics of the studied Health Regions and Municipalities.

Health Region	Number of Municipalities by Health Region	Population by Health Region (2021)	Municipalities Research Field	Population by Municipality (2021)	HDI of the Municipality (2010)	Number of COVID-19 Cases (2020-2023)	Number of Deaths from COVID-19 (2020-2023)
Inner Health Region (IHR)	8	328,335	Large Municipality	240,542	0.815	66,893	663
			Medium Municipality	41,545	0.751	7,630	113
			Small Municipality	1,752	0.722	459	5
Metropolitan Region of São Paulo Health Region (MRHR)	11	3,092,717	Large Municipality	1,404,694	0.763	102,475	5,586
			Medium Municipality	303,397	0.765	29,441	1,043
			Small Municipality	30,465	0.731	2,583	112

Source: Estimated population in 2021 and HDI calculated for 2010: IBGE. COVID cases and deaths: Government of the State of São Paulo COVID Pannel. Updated on 03/22/2023. Available at https://www.seade.gov.br/coronavirus/.

its coding was performed by at least two researchers. Based on reports, results were organized into tables, considering four dimensions of WhatsApp® use. In total, three dimensions were appropriated from Santos *et al.*[14]: 1) professional training, teaching, and research; 2) communication between health service professionals; and 3) professional-user relationships. A fourth dimension was added from a new plane of visibility that emerged with great recurrence and intensity in the empirical material: 4) health management.

The process of analysis of the empirical material was based on the theoretical framework of Institutional Analysis (IA)[15], which has gained expression in research on collective health[16], using the concepts of analyzer, implication and instituted-instituting.

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Results and discussions

Processing the empirical material from the interviews (which included 61 actors involved in coping with the COVID-19 pandemic in the two studied health regions) found 25 reports on the use of WhatsApp®, which Chart 3 transcribed and organized by visibility plans: training and research, interprofessional communication, and health care and management.

Only one report identified the use of WhatsApp® as a teaching and learning tool in an educational process aimed at community health agents (CHA). Other visibility plans described other reports that narrate the informal use of the application to disseminate technical information, which could also be considered training actions.

The use of the application also exchanged epidemiological data and technical information and discussed clinical cases among health service professionals. Reports emphasize SUS workers' ethical commitment, overload, and exhaustion, including the possibility of communication/interaction 24 hours a day via WhatsApp®.

Virtual communication between professionals and users of health services constituted another possible use of WhatsApp®. The narratives refer to CHA maintaining bonds and follow-ups, the reception and remote assistance in mental health, and the individualized monitoring of the evolution of COVID-19 cases in home isolation.

This research evinced the use of WhatsApp® as a tool to support the management of the health crisis with significant intensity and regularity. Reports described institutional communication actions (between health managers, professionals, and services), interfederative communication (between municipal managers

Chart 2. Interviewees in the Inner (IHR) and the Metropolitan Region of São Paulo (MRHR) Health Regions, 2022.

Interview	Date	Region	Place of Work	Work Area of the Interviewee(s)	Layer
E 1	08/06/22	IHR	Council of Municipal Health Secretaries/State Department of Health (SES)	Institutional support	1
				Primary Health Care	1
E 2	07/06/22	MRHR	Council of Municipal Health Secretaries/State Department of Health (SES)	Institutional support	1
				Primary Health Care	1
E 3	14/07/22	IHR	LSM	Management	1
E 4	14/07/22	IHR	Regional Department of the State Department of Health (DRS)	Management	1
				Planning	1
				Accreditation	1
				Management	1
				Epidemiological Surveillance	1
E 5	15/07/22	IHR	SZM	Management	1
E 6	13/07/22	IHR	MSM	Hospital care	1
				Management	1
				Hospital infection control	1
				Hospital infection control	1
E 7	23/08/22	IHR	Regional Department of the State Department of Health (DRS)	Planning	2
				Primary Health Care	2
				Epidemiological Surveillance	2
				Technical assistance	2
				Accreditation	2
				Permanent education	2
				Management	2
E 8	22/08/22	IHR	SZM	Mental health	2
E 9	22/08/22	IHR	SZM	Primary Health Care	2
				Epidemiological Surveillance	2
				Management	2
E 10	22/08/22	IHR	SZM	Social work	2
E 11	22/08/22	IHR	SZM	Pharmaceutical Services	2
E 12	24/08/22	IHR	MSM	Hospital infection control	2
				Sanitary Surveillance	2
				Epidemiological Surveillance	2
				SAMU	2
				Sanitary Surveillance	2
				Hospital care	2
E 13	23/08/22	IHR	LSM	Primary Health Care	2
				Specialized care	2
E 14	23/08/22	IHR	LSM	Regulation	2
E 15	23/08/22	IHR	LSM	Epidemiological Surveillance	2
				Health Surveillance	2
E 16	23/08/22	IHR	LSM	Social work	2
E 17	14/07/22	MRHR	MSM	Management	1
				Management	1
E 18	03/08/22	MRHR	SZM	Management	1
E 19	24/08/22	MRHR	SZM	Regulation	2
E 20	03/10/22	MRHR	SZM	Primary Health Care	2
				Health Surveillance	2

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Chart 2. Interviewees in the Inner (IHR) and the Metropolitan Region of São Paulo (MRHR) Health Regions, 2022.

Interview	Date	Region	Place of Work	Work Area of the Interviewee(s)	Layer
E 21	19/07/22	MRHR	Regional Department of the State Department of Health (DRS)	Planning	1
E 22	15/07/22	MRHR	Regional Department of the State Department of Health (DRS)	Management	2
E 23	06/07/22	MRHR	LSM	Management	1
				Human Resources	1
				Management	1
E 24	05/09/22	MRHR	LSM	Healthcare	2
E 25	05/09/22	MRHR	LSM	Regulation, Monitoring, and Evaluation	2
E 26	05/09/22	MRHR	LSM	Health Surveillance	2
E 27	31/05/22	MRHR	MSM	Mental health	2
				Primary Health Care	2
				Health Surveillance	2
E 28	24/11/22	MRHR	Regional Department of the State Department of Health (DRS)	Epidemiological Surveillance	2
E 29	24/11/22	MRHR	SZM	Health Surveillance	2

Source: Authors.

and between them and regional directors of the State Secretariat), and regulation of access to COVID-19 cases. The formation and use of numerous WhatsApp® groups are recognized as relevant to the fight against the pandemic, despite managers' exhaustion (who used them uninterruptedly).

This study analyzed the use of WhatsApp® in coping with the COVID-19 pandemic from the perspective of the concepts of analyzer, implication, and instituted-instituting derived from AI, which was introduced in Brazil in the 1970s and has gained expression in research and interventions in public health as a theoretical-methodological reference for the analysis of SUS institutions[17]. As limitations of the research, we point out the temporal and territorial scope of the studied field, which, although forbidding broad generalizations, enables an in-depth understanding of singular situations experienced in the pandemic.

The COVID-19 pandemic as an analyzer of health practices

For AI[15], analyzer shows the structure of the organization, provoking it and forcing it to speak. When identified, the analyzer evinces the relationships between people, groups, classes, institutions, and organizations and their way of functioning[17]. By collecting narratives from SUS managers and workers about coping with the pandemic, it becomes a powerful analyzer since it unveils new productions and arrangements that configure instituting practices of management, work, and health care.

In this study, the "COVID-19 pandemic" emerges as an analyzer for health institutions and practices due to the plasticity demanded from SUS in the face of the health emergency[6]. A similar case studied nursing work using a WhatsApp® group as an instrument to collect data, in which new circumstances, such as changes in the regulation of professional attributions and changes in the epidemiological scenario with the identification of yellow fever cases, triggered analytic situations[18].

In the COVID-19 pandemic, facing a new, unknown, and contingent situation, associated with the limitations due to the need for social isolation and the issue of new technical standards, denaturalized established practices. Interviewees' reports bring to light transformations in the micropolitical processes of health

Chart 3. Reports of the use of WhatsApp® in the fight against the COVID-19 pandemic.

Loss of visibility	Verbatim
Training and Research	"*Another thing the CDQ staff here did was continuing training for community health agents. A WhatsApp group where they held meetings, talked about activities. There are also UFSCAR people who helped a lot, which are the training, research, and extension staff. In these groups, they discussed the role of the community agent, what they could do, monitoring and guiding them to seek health services*" E3.
Interprofessional Communication	"*We lived the pandemic 24 hours a day within a WhatsApp group where notifications, CROSS files, patient status, were deposited… The sensitization, the commitment of the professionals, was thus outstanding. It made you wanna cry 24 hours a day. I cried and the girls cried to see the stories in that group, begging for a place inside a hospital, an ICU bed. It made you wanna cry*" E3. *"At that same time, the protocols were already being changed by the CCIH, there were times when we changed the flow twice a day because of how much things changed, but everything that was changed we already went through in WhatsApp groups to speed up communication and for everyone to follow the same path*" E5. *"Wow, my husband wanted to kill me! I said: how am I going to leave the girls without guidance? [...] Since we couldn't meet anymore, I said: I'm going to set up a WhatsApp group. It was 24 hours a day of technical documents, downloading them from the internet, because there is a group of 60, 70 nurses [...] and there we disseminate all the guidance via email and WhatsApp because WhatsApp was something that is much easier to disseminate. WhatsApp was a very important factor, because among health professionals, all technical documentation was disseminated on WhatsApp"* E6. *"They had a WhatsApp group that ended up doing the clinical management of the cases, the management of care!"* E17. *"They would send a doctor's report, summary, by email or WhatsApp, they had a group"* E18. *"I have a sanitarian agent who understands this area of data collection [...] so, we, from the planning area, say: "you do this survey and you do this monitoring for us" and we put it on WhatsApp for everybody"* E20.
Health Care	*"Monitoring happens daily to this day. An employee already passes on positive cases and, either by phone or WhatsApp, she monitors them. If they notice any alarm signs, then the patient is already instructed to look for the unit or the physician will go to the residence if necessary [...] she calls or she sends a WhatsApp message: 'So-and-so, are you okay? How are you? Is there anyone else in your house like that?' She herself already has the freedom to talk to the team or to the nurse or to the physician: 'Doctor, so-and-so is feeling this, this, and that, what do you doctor think, should we ask her to come here?' The workers themselves will get in touch with a patient: 'Ms. Mary, the doctor is waiting for you here, the ambulance is coming to pick you up'. That reflected a lot on our aid, it really reduced the need for transfers"* E4. *"One issue that the CHA brought up is that many ended up listening on WhatsApp and did not go to have a dialogue, to talk. It was a way for them to leave this bond strengthened, having this other way of relating"* E6. *"During the pandemic, everything stopped. They did one or another individual care at the CAPSs [center for psychosocial care], no longer group care. Due to COVID, it was remote service, WhatsApp service, video call service"* E7. *"We also had this unique characteristic in mental health. We created a channel for patients. There was a WhatsApp group in which people could send messages and our professional contacted these people, gave them the necessary assistance [...] Vulnerable people or with a mental disorder, we follow these cases very closely, throughout the pandemic period by WhatsApp 24 hours a day. No! 36 hours a day!"* E26.

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institutions and their organizations, most of the time already under development before the pandemic, but strongly emerging in the face of the new situation, unveiling instituting processes:

Chart 3. Reports of the use of WhatsApp® in the fight against the COVID-19 pandemic.

Loss of visibility	Verbatim
Health Management	*"This makes a big difference, a regulation forum WhatsApp group, countless conversations all day long [...] the commitment of everyone and the presence of providers on a regular basis to listen to both what the State has to say, and what the municipalities are putting in"* E1. *"It's such a basic instrument, a GT COVID group on WhatsApp [...] we put the form, 'look, there's such a case, there's I don't know what', so I said: 'no, ask to direct it here and I'll attend or even I'll ask for help in other DRS' [...] I said: 'I'm going to set up a WhatsApp group' because I didn't have the telecoms yet. The disclosure took place by e-mail and WhatsApp [...] Our WhatsApp group worked Saturdays, Sundays, there was no day off [...] there are the CIR groups. We are in all of these CIR groups, then we publicize it in the CIR, publicize it in the TG, publicize it in the surveillance group and there is the regulation forum, which are all the hospitals and all the managers as well!"* E3. *"We have a WhatsApp group; it was all virtual. So, at the time, we have a WhatsApp group of managers [...] We even had a few meetings but most of them were handled virtually, a WhatsApp group with mayors and managers basically"* E4. *"The technical part, it was everything in the CIR that we solved, including, on WhatsApp, there was a group of ours, which has the group of managers to this day"* E5. *"The COE group was active and necessary for information to arrive faster, right? We already had the WhatsApp group, and I guarantee that many lives were saved in the face of this network, because a network was formed [...] this solidarity among everyone, even because we were diving into the unknown [...] all this discussion was only on WhatsApp or in Zoom meetings [...] the great gain we had in this pandemic was to use these tools. How it made everything quicker! It made everything quicker and tortured us, you know, because, I'll tell you something: it's 24 hours, right? [...] before you attended a meeting, it was the whole day, you went there in São Paulo, you have all the commuting, then the coming back. Now, you're in a meeting there, that's over, you were in another one [...] you optimized a lot of things, but it overloaded"* E6. *"They also needed public security to keep up with the vaccines [...] so we got the commander, made a WhatsApp group"* E6. *"Our management asked everyone to participate. All employees were included in the WhatsApp group. But if the person didn't want to participate, didn't want to be in the group, they weren't obligated. She was included, but she was free to leave the group at any time"* E7. *"We had a regulation WhatsApp group. A patient would arrive with a really serious case, who was unable to stay there in the support: 'Look, we need to squeeze them in, this patient doesn't have the clinical conditions to stay here'. Then we would go and start making this other regulation, asking for priority, in the case of the patient, among the managers of this DRS [...] we did it through CROSS, but on WhatsApp we had a faster response"* E8. *"So we set up a WhatsApp group. We received the information; we had meetings in the morning, in the afternoon and at night. With each new information that came, we called on the WhatsApp group to hold meetings, we had Zoom meetings, which we learned, we had to learn how to move, how to work with him"* E16. *"Through social media, WhatsApp, that whole thing: when it's going to be released, when it's not, we're supposed to stay home, we're not supposed to stay home [...] public transport, mandatory masks"* E22. *"It was a committee to cope with COVID-19. All the problems that appeared, the complications, went to the committee. We were practically gathered at the end of the day in the living room and also by WhatsApp"* E26.

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We already had the WhatsApp group and I guarantee that many lives were saved due to this network [...] this solidarity among everyone, even because we were diving into the unknown [...] all this discussion was only through WhatsApp (E6).

For Lorau:

The analyzer deinstitutionalizes, reveals the stifled instituting under the instituted and, in doing so, disorders it [...] the institution possesses the power to materialize in apparently neutral

Chart 3. Reports of the use of WhatsApp® in the fight against the COVID-19 pandemic.

Loss of visibility	Verbatim
Health Management	"*We listed that these three areas would be important: Surveillance, Assistance at the municipal level, and hospitals here in the region. So, we quickly made a WhatsApp group. At the moment when the regulation did not cope, the group became a solidary thing so the municipalities with the most difficulties could say in the group: 'Guys, for God's sake, I need help!' And then: 'I'm with someone like that…', even described the case and a hospital that had a vacancy at that time said: 'You can send them here'. It wasn't an institutionalized thing, but it was something that was being composed in that way at that time [...] The WhatsApp group remains, but it's silent, I think if the scenario continues the way it's happening, maybe it will come back*" E27. "*The conversation is very continuous between us and the municipalities. As they sometimes also come to get supplies, death certificates, vaccines, they go up and knock on our door, they come in and talk to us, outside the phone, outside the WhatsApp group [...] you notice that you send an email and say in the group: 'Check the email we sent'. Then, they don't respond by email, but on WhatsApp immediately. So then they start in the group to discuss, they start asking what they're going to do and what they're not going to do. [...] for better or for worse, this WhatsApp has sped up information and discussions, but just like that, you leave here at 6 o'clock in the afternoon, no one cares, the groups continue [...] We get along very well, we have formal contact between GVE and the municipalities and we have personal contacts. We have everybody's phone number, we have WhatsApp groups that we continued to implement, they have been creating more humanization, of this, of that, responding very well [...] Then he would say: 'Guys, I need this here…', and we said: 'Waiting for the batch, the batch information' [...] we already have the immunization WhatsApp group as well, so in this group: 'Look, there's going to be vaccine on that date…' [...] already put the batch, the amount that each municipality will receive, if it has the D1, D2 dose, all those things. Distribute it to the group and set an appointment to pick it up*" E28. "*The bulletin was an initiative of ours because we realized the need since the news traveled much faster on social media, and then we realized that we had this delay in information and it was not an epidemiological profile of sustained information to support decision-making. So we decided to make this bulletin, it started from here, from the official information that we had in the bank and it was made available by email and WhatsApp*" E28.

Source: Authors.

and universal forms, at the service of all, the forces that dominate us, pretending, at the same time, to help and defend us. The analyzer dematerializes the forms of oppression, revealing the forces that lurk in it[19].

The (over)implication of SUS managers and workers with the defense of life

A central concept for IA refers to affective, ideological, and professional involvement (including unconsciously) in all we do[15]. Regardless of whether they are engaged or not in the activities of a given organization, they are, in some way, still involved with the institution of which they are part[19]. In this research, reports indicate strong commitment, engagement, and sensitization from the involved actors. A sense of ethical commitment in defense of life, in a situation of humanitarian tragedy, expressed in great emotion: "*We lived the pandemic 24 hours a day in a WhatsApp group [...] the awareness, the commitment of the professionals was, like, out of the ordinary. It made you wanna cry. I cried and the girls cried when they saw the stories in that group, begging for a vacancy in a hospital, in an ICU bed*" (E3). The involvement of SUS workers and managers with the health institution at the time of the health emergency appears in reports of full-time work, 24 hours a day, uninterruptedly, via communication by WhatsApp® groups: "*We set up a WhatsApp group: I received the information, held meetings in the morning, in the afternoon and at night. With each new piece of information that came, we posted on the group*" (E16).

A greater integration was seen in the health management-work field due to the agile com-

munication provided by WhatsApp® groups, especially the rapid sharing of information in real time: "*Protocols were changed. There were times when we changed the flow twice a day because of how much things changed, but everything that was changed was already happening in the WhatsApp groups to speed up communication and for everyone to follow the same path*" (E5). Regulatory actions for clinical cases, transfers, and hospitalizations, including at the regional level, have also formed solidarity networks: "*We made this WhatsApp group quickly. When regulation did not cope, the municipalities with the most difficulties posted on the group: 'Guys, for God's sake, I need help! I'm with a person that…' and would describe the case. A hospital that had a vacancy at that time would say: 'You can send them here'*" (E27).

The strong commitment to the defense of health and life, reported by most of the interviewees, also brought overload, exhaustion, and suffering: "*It sped everything up! It sped up and tortured us because it's 24 hours a day, right? [...] several things were optimized, but it overloaded us*" (E6). Lorau[15] claims the existence of points of blindness called overimplication. This occurs when subjects reproduce institutional norms so automatically and intensely that they lose the ability to analyze their own actions. The intensive use of WhatsApp® invaded all dimensions of the world of life, capturing the personal lives of workers and managers: "*My husband wanted to kill me! I would said, 'How am I going to leave the girls without guidance?'*" (E6).

In a study with teachers, Sousa *et al.*[20] found that WhatsApp® can have a positive influence if used moderately and a negative influence if its use causes anxiety or distractions in daily activities. In health, Malaman *et al.*[21] studied municipal managers in the pre-pandemic period using the AI framework, finding the correlation of political and technical forces developed in the daily work of health secretaries and the suffering this situation can cause, especially when implication becomes overimplication. For the authors, the pressures inherent to the position cause suffering and can lead to illness without the implication of a manager's analysis along with developed professional practices. For Lorau[15], overinvolvement can produce overwork, stress, illness, and death.

Reports thus make visible the affective dimension that crossed the use of WhatsApp®, in the intensification of relationships that no longer had time to be processed, in the intensity of these that, in addition to fatigue, interfered in family life, in the emotional disturbance in the most serious cases, and in the joy of seeing a person receive care, referred to the service appropriate to their clinical condition, often for solidarity actions.

The use of WhatsApp® as a potentiating arrangement of instituting movements

Over two billion people, in more than 180 countries, use WhatsApp® to connect with friends and family anytime and anywhere making it a fast and reliable messaging service[8]. Its use by health workers and managers, even before the pandemic, was already described in clinical practices[22], doctor-patient relationships[23], work in hospitals[24], oral health actions[25], monitoring of people with HIV[26], professional training[27], continuing training[28], access regulation[29], and management of health services[30]. In addition to WhatsApp®, other telehealth strategies, such as teleconsultations, in use before the pandemic, also offer possibilities for remote screening, care, and treatment via various digital tools[31]. This study evinced WhatsApp® as an arrangement that enhances instituting movements in health management, work processes, and care in the context of coping with the COVID-19 pandemic.

For Lorau[15], the analysis of the institutions considers the constant dialectical movement between three moments: the instituted, the instituting, and the institutionalization. Institutions are norms but include the way in which individuals agree to participate in those norms. For the author, real social relations and norms belong to the concept of the institution, which permeates all levels of human groups and to the symbolic structure of groups and individuals[19]. For Moura *et al.*[32], the instituting, in turn, refers to the questioning of this universalizing and naturalizing characteristic of the instituted forces, feeding the capacity for change and the creation of new institutional practices, the institutionalization.

This research found WhatsApp® to be used by healthcare providers to exchange epidemiological data and technical information and discuss clinical cases and professional regulatory actions in health services. Practices which, based on the incorporation of digital technology, move from a notarial and formal action to living and dynamic movements.

According to Mendes-Gonçalves[33], health work instruments, rather than natural, are historically constituted by subjects, who expand

the possibilities of intervention on their object, identifying the presence of material and non-material instruments. The former refer to equipment, consumables, medicines, and facilities, whereas the latter, to the knowledge that articulates health workers and material instruments in certain arrangements.

Merhy[34], by introducing the analysis of the micropolitics of live work in action in health and the typology of health technologies, recalls the conception of living work and dead work. It defines the latter as all the means-products that are involved in the labor process and that result from previous work, and living labor as instituting labor in act. For the author, the processual and transformative dimension of live work in action in health is attributed to its essentiality in action and, as such, it will be a source of new technologies to the extent that it can open lines of flight in what is already instituted.

Within the literature, the uses of WhatsApp® had already been identified in interprofessional communication in health before the pandemic. It can favor the existing communication in a health service, facilitating daily interactions between professionals from teams or sectors, or between them and those who are far away, such as specialists, providing faster clinical communication, sharing of diagnoses and information, requests for exams and photographic evidence[14]. Mars and Scott[22] see WhatsApp® as a simple, cheap, and effective means of communication in health, expecting the growth of its use. Its use is attributed to the professional perception of numerous advantages and benefits in clinical practice[24]. It is an instituting movement not only for change in communication actions but also in the health work process. Tofani *et al.*[29] found the use of WhatsApp® in access regulation movements as "unofficial" or even informal arrangements. This study on the context of coping with the COVID-19 pandemic also found these practices: "*I had a regulation WhatsApp group. A patient arrived who had a really serious case, who was not able to stay there: 'We have to squeeze them in, this patient is not clinically able to stay here'. Then we started to make this other regulation, asking for priority [...] we did it through CROSS, but, on WhatsApp, there was a faster response*" (E8).

In general, the pandemic demanded a reorganization of the work process and care flows throughout the health network, strengthening and institutionalizing the use of different telehealth strategies[35]. An example is CHA's work, which, in view of the need to adopt social distancing measures and restriction on home visits, recognized the possibility of replacing home visits with "online visits" intermediated by communication channels such as WhatsApp® for communication with the population[36]. They report: "*One issue the CHA brought up is that many ended up listening on WhatsApp and did not go out to visit*" (E6).

An issue identified and discussed in the literature refers to the ethics and preservation of professional secrecy in the exchange of messages in applications[14,22]. In recent years, with the technological avalanche that has brought usefulness and effectiveness, the more rigid conjecture of the use of the application in professional secrecy has failed to resist the popularization of the new communication habit: physicians connect with patients and colleagues by WhatsApp®, considering it to be an agile and low-cost technology that facilitates communication in a way that avoids harming the preservation of professional secrecy[37]. In 2017, the Federal Council of Medicine had already supported it by a resolution that regulates the use of the application:

The use of WhatsApp and similar platforms for communication between physicians and their patients, as well as between physicians and physicians, on a private basis, to send data or answer questions, as well as in closed groups of specialists or the clinical staff of an institution or chair, is allowed, with the exception that all information passed on is absolutely confidential and cannot go beyond the limits of the group itself, nor can they circulate in recreational groups, even if composed only of physicians[38].

This study has no reported concerns about professional secrecy, but includes some on human ethics based on the perception that a fast means of interprofessional communication can contribute to the guarantee of qualified care and to the regulation of agile access in the professional dimension: "*They sent a doctor's report, patient information, via WhatsApp, they had a group*" (E18).

The transformations in the health work process in the context of the COVID-19 pandemic due to the use of WhatsApp® directly impacted the care practices provided to the population[39]. For Cecilio[36], we can define health care management as the provision or availability of health technologies according to the unique needs of each person at different moments of their lives, aiming at their well-being, safety, and autonomy to continue a productive and happy life. Providing access and care to health in the pandemic context has become a huge challenge that has

demanded the use of new technologies. According to Sodré and Rocon[40], the use of soft technologies in health work, which produces knowledge in the unpredictability of encounters, experiences, and events, produces care relationships and calls for the creation of ways of caring, working, and managing the daily life of health through the metamorphosis of an êthos.

In a literature review, Santos *et al.*[14] found that the application could overcome barriers of time and space, bringing users closer to health services, enabling guidance and faster and more targeted care regarding existing demands. For Leão *et al.*[23], the application is used in physician-patient relationships, preferably to solve doubts. In dentistry, the use in dentist-patient relationships refers to teleconsultations, diagnoses, second opinions, oral health education and prevention, treatment adherence, and monitoring[25]. Lima *et al.*[26] reported that health monitoring via WhatsApp® promoted accessibility for people with HIV to healthcare providers, providing an open and immediate means of communication for issues such as doubts and psychosocial issues.

In this research, healthcare providers' communication, maintenance of bonds, monitoring of users in home isolation, admission, and remote care constitute instituting practices of distance care: "*During the pandemic, everything stopped. They did one or another individual care at the CAPSs [center for psychosocial care], no longer group care. Due to COVID, it was remote service, WhatsApp service, video call service*" (E7). The literature has few case studies and experience reports on the use of WhatsApp® during the pandemic. We highlight the "*Fale com a Parteira*" (Talk to the Midwife) in Recife, Pernambuco, which made it possible to offer a telenursing service to promote maternal health with the use of a technological strategy to offer support, follow-up, and safe reception to pregnant and postpartum women during the COVID-19 pandemic[41].

The pandemic enabled a relaxation of rules and institutes in health, strengthening, in some contexts, the bond, such as soft care technology by the use of mobile applications: "*It was a way of strengthening the bond, having this other way of relating*" (E6). For Bueno *et al.*[9], healthcare providers realize that digital technologies and social media during the COVID-19 pandemic in Brazil made it possible to maintain contact with patients. Looking at the care process, some readings claim the use of these tools will continue after the pandemic, and others, that they will be abandoned from the daily professional life due to the change in the epidemiological scenario: "*The WhatsApp group remains, but it is silent, I think if the scenario continues the way it is, maybe it will come back*" (E27); a clear expression of the instituted-instituting-institutionalization process underway.

In management, this research reports institutional communication actions (between managers, healthcare providers, and services) and inter-federative communication (between municipal managers and between them and regional directors of the State Secretariat): "*The conversation is very continuous between us and the municipalities [...] you notice that you send an email and say it in the group: 'Check the email we sent'. Then, they don't respond by email, but on WhatsApp immediately. Then they start discussing in the group, they start asking what they're going to do, what they're not going to do*" (E28). Thus, the formation of WhatsApp® groups is recognized as relevant to the fight against the pandemic.

Savio *et al.*[30] studied how service managers at different levels of health care use WhatsApp®, highlighting the importance of the application as a strategic tool to manage health services based on the sharing and integration of information in real time. Among the main findings, the following stand out: distrust of the issuer about the use of the information sent; the impact of agility and problem-solving capacity on managers' workdays; the use of the application as a strategy to integrate services and professionals involved in service management; the usefulness of WhatsApp® as a management tool, and the perception of its usefulness in decisions that influence the work process. On the other hand, Meirelles *et al.*[28], in analyzing the use of the mobile application as a tool for managing Permanent Health Education actions in the state of Rio de Janeiro, showed that it is little used in planning, follow-up, monitoring, and evaluation activities. It was pointed out as a restricted tool for receiving/sending messages and sharing documents, and difficulties were identified in the use of the application related to the excess of messages, which require availability of time for their reading and response.

In the fight against the pandemic, numerous WhatsApp® groups have been formed, including with SUS managers, service coordinators, and workers. "*It's such a basic instrument, a GT COVID group on WhatsApp [...] we used to put the form, 'look, there's this case, there's I don't know what', so I said: 'ask me to direct it*

here and I'll serve them' [...] There are the CIR groups. We are in all of them, then we publicize this at the CIR, we publicize it in the GT, we disclose it in the Surveillance group and there is the Regulation group, which has all the hospitals and all the managers too!" (E3). In addition to institutional communication, an important use in management refers to searching for beds to transfer severe cases. Beyond the regulation of access in the professional regime, this research found an instituting movement in government regulation, moving from the formality of central offices and official computerized systems to direct action between managers by WhatsApp®. For Tofani *et al.*[29]:

There are substantive indications that validate its use as a technological arrangement of care, legitimate and necessary for the creation of more agile and problem-solving circulation flows. It is a networked production of care that takes users' lives as a reference so the various points of care are connected and living networks of care are produced based on health needs. Thus, the use of WhatsApp can promote a "hot regulation", in which the main interest is the production of life and health[29].

It can be seen that, in the face of the pandemic, official institutional communication has gone from the formality of memoranda, ordinances, printed technical documents, and information systems to a growth of instant messaging in WhatsApp® groups, even if for personal use and on an unofficial basis. For Merhy, no polarity between formal and informal exists as an organizational space and arrangement, but an organization should be "seen" under this formal and informal fold all the time:

Conversational networks are forms of materialization of the so-called organization as a permanent fabrication of institutional agents [...] agents act, even, when they produce speech acts when they inscribe themselves in conversational relations[42].

Final considerations

Coping with the COVID-19 pandemic configured a singular moment in the contemporary world that demanded plasticity from health systems. Informally produced micropolitical practices emerged in an accelerated process of institutionalization as a response to the health emergency by innovations and new arrangements. The use of the WhatsApp® application has become an arrangement that has enhanced instituting processes of new health care management practices and work processes in a more lively, communicative perspective, produced in action, especially from the challenges due to the pandemic. These practices, often involved in the defense of life, have required constant and full-time communication from health managers and professionals, producing an inseparability between the world of work and personal life, often configuring situations of exhaustion, with potential compromise of the health of SUS managers and workers.

Further developing the view on the use of this tool makes visible the development of relational and communication processes, which are central to the production of care. Reflecting on the use of WhatsApp® raises questions about how communication tools in general will continue to cross care management and how the many forms of living work, instituted during the pandemic, will be incorporated into the daily life of the SUS.

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LFN Tofani: collaborated in the preparation and supervision of the project, in the collection and analysis of data, in the preparation, writing and final review of the article. A Chioro: collaborated in the preparation and supervision of the project, in the analysis of data, in the preparation, writing and final review of the article. AL Bigal collaborated in the preparation of the project, in the collection and analysis of data, in the preparation and critical review of the article. F Turek collaborated in the preparation of the project, in the analysis of data, in the preparation and critical review of the article. LAC Furtado: collaborated in the preparation of the project, in the analysis of data, in the preparation and critical review of the article. R Andreazza collaborated in the preparation of the project, in the collection and analysis of data, in the preparation and critical review of the article.

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