
Research and Applications

Consumer workarounds during the COVID-19 pandemic: analysis and technology implications using the SAMR framework

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ABSTRACT

Objective: To understand the nature of health consumer self-management workarounds during the COVID-19 pandemic; to classify these workarounds using the *Substitution, Augmentation, Modification, and Redefinition* (SAMR) framework; and to see how digital tools had assisted these workarounds.

Materials and Methods: We assessed 15 self-managing elderly patients with Type 2 diabetes, multiple chronic comorbidities, and low digital literacy. Interviews were conducted during COVID-19 lockdowns in May–June 2020 and participants were asked about how their self-management had differed from before. Each instance of change in self-management were identified as consumer workarounds and were classified using the SAMR framework to assess the extent of change. We also identified instances where digital technology assisted with workarounds.

Results: Consumer workarounds in all SAMR levels were observed. *Substitution*, describing change in work quality or how basic information was communicated, was easy to make and involved digital tools that replaced face-to-face communications, such as the telephone. *Augmentation*, describing changes in task mechanisms that enhanced functional value, did not include any digital tools. *Modification*, which significantly altered task content and context, involved more complicated changes such as making video calls. *Redefinition* workarounds created tasks not previously required, such as using Google Home to remotely babysit grandchildren, had transformed daily routines.

Discussion and Conclusion: Health consumer workarounds need further investigation as health consumers also use workarounds to bypass barriers during self-management. The SAMR framework had classified the health consumer workarounds during COVID, but the framework needs further refinement to include more aspects of workarounds.

Key words: consumer workaround, patient work, chronic comorbidity, self-management, COVID-19

INTRODUCTION

The COVID-19 pandemic has disrupted the normal routines of daily life for many.^{1–3} For those in the community with illnesses, changes have come in the form of disruption to health services through to access of medications. Many day-to-day routines associated with phys-

ical and mental wellbeing have also been challenged by lockdowns and enforced isolation.^{1,2}

It is in the nature of self-care and self-management that ownership of health and wellbeing goals are owned by the individual, as are the mechanisms to meet them. Thus, while some changes related to the pan-

demographic were imposed, other changes of necessity were made by individuals in the community as they sought to manage their needs and goals.

Technology appears to have played an important role in supporting imposed changes to routine, for example allowing patients to engage with remote healthcare professionals using telecare. What is less understood are the types of change in self-management goals or routines developed by health consumers, the extent to which technology has helped these, and the opportunities these changes offer for innovation in consumer informatics.

In health informatics, there is a well-developed notion of workarounds which are “informal temporary practices for handling exceptions to normal workflow.”⁴ This conceptual structure may assist in understanding how health consumers, considered as anyone managing their own health with or without a medical diagnosis, approached making changes to their “normal” way of self-managing. In health services, workarounds are “observed or described behaviors that may differ from organizationally prescribed or intended procedures in which workers “circumvent” or temporarily “fix” an evident or perceived workflow hindrance in order to meet a goal or to achieve it more readily.”⁵ A body of literature produced about self-management disruptions during the pandemic has outlined the difficulties of managing chronic diseases,^{6,7} and examining workarounds would permit description and analysis of the mitigating measures people employ to bypass such difficulties.

The notion of “workflow,” which underpins the study of workarounds, is most closely matched in consumer informatics by “patient work” (tasks associated with managing health, eg, self-inject insulin),^{8,9} and “everyday work” (tasks undertaken to maintain everyday life,^{8,9} eg grocery shopping). “Patient work” is derived from Corbin and Strauss’ pioneering studies on illness work and the tasks involved to maintain health,⁸ then extended by Holden et al.^{9,10} The *Substitution, Augmentation, Modification and Redefinition* (SAMR) framework, initially used in the field of education, provides a specific typology for the extent of change required for a workaround, allowing categorization of the different workarounds conducted to bypass barriers.^{11–13} The framework assesses differences between current and previous practices and had been used to classify the extent of self-management change brought by digital tools.¹³ *Substitution* changes describe when new practices directly replaced the previous activity, but had no functional change (eg, Patient reading a paper pamphlet on diabetes vs reading the same pamphlet in PDF format on a computer). *Augmentation* describes a replacement in practice that also significantly changes the function of the task (eg, Patient viewing a video clip containing the same information as the pamphlet). *Modification* describes when the practice has been completely altered in its function and the task became very different (eg, Patient receives a software package that interactively illustrates the same information as the pamphlet), and *Redefinition* describes totally novel practices that achieves the goal of the previous activity in a completely different way (eg, Patients conduct online focus groups to discuss their personal experience with diabetes). Even though *Redefinition* tasks involved the creation of new tasks, they are still temporary responses to new needs arising from the pandemic. Their purpose is to bypass a transient lack of health resources or support, and over time would ultimately become unnecessary or be supported externally.

OBJECTIVES

The aim of the present study is to explore whether and how health consumers adapted their routine in response to the challenges of

COVID-19. We defined a workaround as any change to a self-management routine that in some way repairs or circumvents barriers to executing the routine. The SAMR framework was used to explore this underexplored notion of workarounds in a health consumer setting. We specifically focused on the use of digital tools in these workarounds, as well as explored new opportunities for digital tools to support unmet needs revealed by workarounds.

MATERIALS AND METHODS

Recruitment

Fifteen participants were invited from a previous study of 26 consumers investigating patient work in community-dwelling individuals with Type 2 diabetes mellitus and chronic comorbidities.^{14,15} Participants were interviewed during the first COVID-19 lockdown period in Sydney, Australia, May–June 2020. Of the 11 participants not interviewed, 5 were unwilling, 4 could not be contacted, 1 was hospitalized, and 1 had died.

Ethics approval was obtained from Macquarie University Human Research Ethics Committee for Medical Sciences (reference number 5201700718). Recruitment strategy details were published previously.¹⁴ Briefly, participants were recruited using purposive sampling from endocrinology clinics. The inclusion criteria were: (1) fluent in the English language, (2) diagnosed with type 2 diabetes mellitus and at least 1 chronic comorbidity, and (3) able to legally give consent. All participants had met the researchers in-person for the original study.

Researchers approached potential participants with a telephone call, during which they explained the purpose and process of the study. During this phone call, we asked whether participants would be interested in participating in this study and arranged for a time approximately 2 weeks later for the study telephone interview. Researchers then sent the study information pamphlet and consent form via email or post (the postversion had a paid return envelope for the consent form) to potential participants. When we called 2 weeks later for the interview, we confirmed with participants that they have indeed read the PICF, and that they were indeed making informed consent, before eliciting and audio-recording their consent over the telephone to conduct the interview.

Data collection

A telephone semistructured interview lasting approximately 1 h was conducted May–June 2020. Participants were asked about their experience during lockdown, focusing on changes in self-management and daily routine. The interview guide is available as [Supplementary Appendix 1](#). The interview questions and procedures were piloted internally within the team and no changes were made following pilot testing.

All interviews were conducted by either KY (female, pharmacy background), JJ (male, clinical sciences background), or AYSL (female, health informatics background).

All interviews were audio recorded and transcribed externally. Repeat interviews were not conducted and transcripts were not returned to participants, as some participants were preparing to move to a different residence. Data were analyzed as interviews were conducted, and recruitment ceased when data saturation (defined as no new workarounds were being described by 2 participants in a row) was reached.

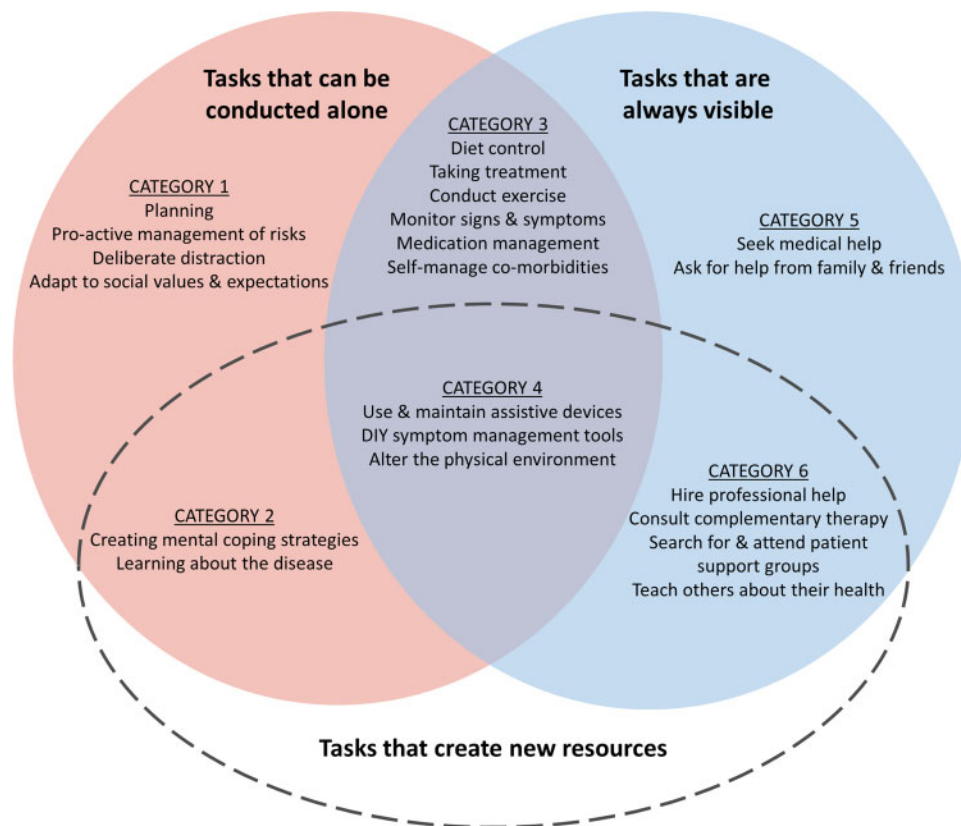


Figure 1. The Patient Work Taxonomy, adapted from Yin et al.¹⁹

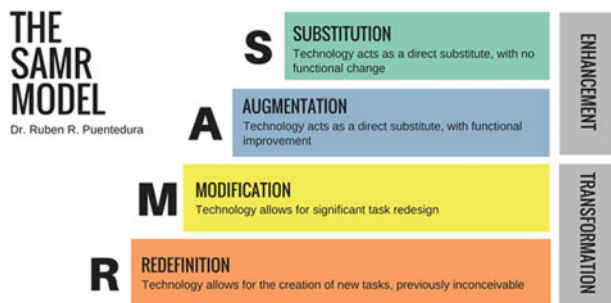


Figure 2. The SAMR model of task transformation, from Wikipedia Commons.²¹

Theoretical frameworks

Existing clinician workarounds frameworks had classified workarounds according to their cause.^{16,17} However, these frameworks were predominantly developed for tertiary care. In contrast, consumers are unlikely to face similar organizational challenges (eg, governance policies), use similar systems (eg, electronic prescribing systems), or undertake similar tasks (eg, medication administration to large wards).

Thematic analysis was conducted on all interview transcripts. Activities were classified according to the Corbin and Strauss framework on self-management.⁸ To include the full scope of tasks that impact self-management (such as grocery shopping and psychological stress about food¹⁸) we also incorporated the Patient Work Taxonomy,¹⁹ which describes additional tasks involved in self-management that may not have been covered by Corbin and Strauss.

Each identified task was classified either as patient work or everyday work. Patient work instances were coded using the Patient Work Taxonomy (Figure 1).¹⁹ Everyday tasks were coded using a condensed version of the Harmonized European Time Use Surveys.²⁰ For a complete list of tasks identified as Patient Work, please see [Supplementary Appendix 2](#).

Each task instance was next labeled as “no change,” “added work,” “removed work,” or “modified” compared to pre-COVID routine to reflect SAMR categories. Those tasks that were “added work” or “modified” were considered workarounds and classified according to the 4 forms of change described in the SAMR model (Figure 2).¹² A substitution directly swaps with the original task but leads to no functional change. Augmentation also directly substitutes for the original task but does lead to functional change. Modification results in significant redesign of an existing task. Redefinition creates new, sometimes previously unneeded, or unnecessary tasks.

Qualitative data analysis

The transcripts were imported into NVivo Plus (version 12, QSR International) for analysis. Transcripts were coded and analyzed by 2 independent coders (KY and UR). KY acted as the lead coder and reviewed all transcripts, identified quotes, classified quotes into categories within patient work and everyday work frameworks, and decided whether each quote described a workaround. KY and UR then assigned each workaround quote into the SAMR model.^{11,22} AYSL acted as external assessor and checked classifications, and disagreement was resolved via consensus. The consolidated criteria for

reporting qualitative research (COREQ) checklist for data analysis and reporting²³ were used.

RESULTS

Participant demographics

Six of our participants were female and 9 were male. The mean age was 74.3 y and the mean number of years diagnosed with Type 2 diabetes was 17.4. The most common comorbidities were cardiovascular diseases, dyslipidemia, and kidney conditions, with a mean number of 2.5 comorbidities (range 1–6) per person (Table 1).

Participants described many communication workarounds, where digital interactions almost entirely replaced in-person communication. The frequency of preventative tasks such as handwashing or using face masks increased. Tasks involving exercise and shopping required many workarounds, with participants conducting exercise indoors and using online ordering and home delivery for food and goods. Some participants reported making no changes (eg, Elderly participants with low digital literacy continued to visit their doctor in person). Some tasks were completely removed (eg, Completely ceasing nonessential visits such as going to church).

SAMR classification of workarounds

Table 2 summarizes the reported workarounds and their SAMR categories. We refined SAMR definitions based on previous uses of the framework for self-management.

Substitution

Example of substitution workarounds included changing work quantity or altering how basic information was communicated (eg, spending more time exercising instead of working; telephoning a doctor instead of in-person consultation). In patient work, substitution involved using digital communication tools to engage with health services. Telephones were used for synchronous communication and text-based methods for asynchronous communication, but the information exchanged were simple and no physical examination was needed. Other substitution examples included doctors sending blood test results via text messaging, or participants providing credit card information over the phone to administrative staff to pay.

“I had a phone conversation with my endocrinologist only. . . We both had enough time to talk all we wanted to talk about. I called to check my blood test results, which were normal.” P03, male, 75 years old

“The main reason for going to see her was to see what the blood test results were. . . So, that’s what she explained to me over the phone and then she sent the reports by SMS to me.” P01, male, 70 years old

In everyday work, substitution using the telephone was reported. Participants called stores to organize for delivery, called social services for financial support, and called family and friends for social connection. In a more complex example, neighbors organized to take turns to buy groceries for each other, resulting in less frequent excursions per family. Participants indicated they already knew how to make phone calls and no extra effort was needed.

“The fruit and vege people - you just ring them up and they deliver for you. And you pay when they get here.” P08, female, 88 years old

“Had to buy [grocery] myself once. Agreed with neighbour to buy groceries for each other. Taking turns to buy stuff for each other. . . I go out once a week” P10, female, 67 years old

Augmentation

Augmentation workarounds included working at home instead of at the office, or balancing childcare and mealtimes with paid work. In patient work, augmentation involved alterations in physical contexts, social spacing, and temporal scheduling. Participants sat farther from others, waited in cars when attending clinics, or scheduled precise arrival times to minimize waiting. Those living in semirural areas reported augmentation workarounds as their local clinics had closed and they had to change transport and scheduling to reach more distant clinics.

“Well GP uh I just came in through my car until he waved at me through the window. And the cardiologist when I went in. . . I was told my appointment was at a certain time and I walked in about 2 minutes before my appointment time.” P07, female, 86 years old

“. . . the pathology service. They closed all their clinics except the central clinic. . . I went to the closest clinic and there was a note on the door telling people to go to the central clinic, 5 hours’ drive away” P03, male, 75 years old

In everyday work, healthier habits were reported to augment existing routines, especially regarding cooking. Participants stated they consumed more healthy foods due to reduced access to fast food and restaurants. At the time of the interview, all participants reported they felt their diet had improved.

Table 1. Participant demographics (n = 15)

Participant demographics	
Gender	6 females, 9 males
Mean age	74.3 years (range: 51–89)
Mean number of chronic conditions	2.5 (range: 1–6)
Mean number of years diagnosed with type 2 diabetes	17.4 (range: 6–35 years)
Typical healthcare professional team	4 members (GP, endocrinologist, podiatrist, ophthalmologist) Others: cardiologist, dietician, nephrologist, diabetes nurse
Lives alone	4 participants
No internet access at home	4 participants
Chronic conditions	Type 2 diabetes Comorbidities: cardiovascular conditions, dyslipidemia, kidney conditions, ocular conditions, thyroid conditions, prostate conditions, traumatic injury

Table 2. Workarounds observed in self-care behaviors during the COVID-19 pandemic

SAMR classification	Original definition	Refined definition	Examples in health	Example quotes
Substitution	Workarounds that directly substitute the original task with no functional change	Workarounds that did not change the content or context of a task; Changes in <i>mechanism</i> (such as duration, frequency or the delivery mode of the content) do not result in significant functional (outcome) changes.	Seeing clinicians physically for a repeat prescription versus calling clinicians via telephone for the same issue	“I’ve done a couple of phone recording. I did a phone recording of my diabetes specialists, and I did one with my local doctor. I did another one with her another day I needed some scripts and I needed to talk to her” P22
Augmentation	Workarounds that directly substitute the original task but result in functional change	Workarounds that did not change the content or context of the task; changes in task mechanism enhanced the functional value of the original task (eg, reduce waiting time, avoids crowds)	Replacing waiting in a reception area for a medical appointment with a call or an SMS prompt to enter the clinic at a specified time to avoid congregating with other patients	“We are telephone booking, we go there, we stay at car park. Then receptionist will call us to go in and wait in a room. Then when it is our turn, the nurse will call us to go in” P09
Modification	Workarounds that involve significant work redesign	Workarounds with significant modifications in content, mechanism, and contexts.	Replacing exercise by walking outside around with use of an indoor treadmill to exercise; replacing in-person babysitting of grandchildren with use of a video-streaming call.	“Just the treadmill, bike and stretch and some yoga, just something like that. [Riding] the indoor bike. I’m not going out.” P19 “Her wireless phone is next to her. My grandkid says, “Google I want to talk to Grandma”! Google will then turn on the wireless phone and then the wireless phone will connect to me through video.” P09
Redefinition	Workarounds that create new, previously unneeded/unnecessary tasks	Workarounds that introduce tasks that were previously not required.	Incorporation of mask wearing and use of hand sanitizers into daily routines	“We go out for supermarket once a week. We must wear a face mask.” P09 “I designate a place in my home where all the groceries stay in quarantine for 3 days. Me and my wife separate groceries into piles based on when they were brought into the house, and we only take things inside after 3 days. If they’re like fresh meat that need to go into the fridge, we’ll wipe it with baby wipes and put it in the fridge, otherwise everything is quarantined for 3 days.” P14

“I probably manage my diet easier at the moment than we did before. It’s easier because I enjoy cooking that may be a passing fad only. But at the moment I enjoy cooking” P20, male, 80 years old

“I think my wife is better looking after my diet now and that’s one of the reasons, is the fact that we are eating better food. Not better food but because there’s not so much ability to go and eat junk food” P17, male, 73 years old

Modification

Modification workarounds significantly altered the content and context of tasks. Examples include purchasing and installing a treadmill at home, or meeting clinicians via Zoom. Some modifications involved participants using—or learning to use—digital communication tools. Depending on preferences, participants utilized different platforms such as Zoom, Skype, FaceTime, and Google Duo. Elderly participants stressed they either specifically learnt, or were taught, how to use these platforms. Participants also reported purchasing equipment that allowed outdoor activities to be conducted indoors (eg, treadmill), or using digital apps to preorder goods.

“Just the treadmill, bike and stretch and some yoga, just something like that. [Riding] the indoor bike. I’m not going out.” P19, male, 68 years old

“I taught myself how to use Zoom! I’m catching up with family and friends on Zoom. If they don’t know how to use the internet, then I call them use the phone.” P03, male, 75 years old

“I order my medication through the MedAdvisor app with the chemist, and it’s all packed and ready to be picked up when I get to the chemist’s, so I didn’t need to stay in there” P14, male, 66 years old

In everyday work tasks, participants also utilized many new communication tools. Examples include using online shopping apps or “smart-home” technology (such as the Google Home) to interact with other households.

“Her wireless phone is next to her. My grandkid says, “Google I want to talk to Grandma”! Google will then turn on the wireless phone and then the wireless phone will connect to me through video.” P09, female, 74 years old

Redefinition

Redefinition workarounds completely transformed routines. These workarounds created new tasks during lockdown. Examples included wearing face masks outside, washing hands, and decontaminating the home and self. The use of physical barriers (eg, Gloves, masks, aprons) was heavily used. Moreover, participants reported attitudinal changes where they changed priorities and altered behavior accordingly. For example, some participants reported accepting and receiving the influenza vaccine for the first time ever.

“My daughter makes sure I’m wearing a mask. . . I’ll wear disposable gloves to go up escalators in the shopping.” P11, male, 79 years old

“First time ever because I hate needles, so we always have to do with some arguing with my doctor every time he offered me a flu injection. Yeah because of the corona, because he said if you’re over 70 you have to have a needle” P23, female, 74 years old

In everyday work tasks, participants developed novel strategies to manage the risk of the pandemic based on their own beliefs, creating unique workarounds that appeased their concerns. Examples include participants using herbal supplements to aid with sleep or inventing “decontamination” routines for groceries. While these workarounds may appear eccentric, they fitted the participants’ internal worldview.

“I designate a place in my home where all the groceries stay in quarantine for 3 days. Me and my wife separate groceries into piles based on when they were brought into the house, and we only take things inside after 3 days. If they’re like fresh meat that need to go into the fridge, we’ll wipe it with baby wipes and put

it in the fridge, otherwise everything is quarantined for 3 days.” P14, male, 66 years old

Digitalization in workarounds

We observed many digital and nondigital workaround tools (Table 3). All digital tools observed involved communication. Participants either used digital technology to actively make conversation (such as via telephone, email, messaging platforms, teleconference platforms, or smart home devices) or to passively receive information (such as radio, video, or social media). In contrast, nondigital tools were more involved in day-to-day health management. For example, home visits from diagnostic labs enabled blood and bowel tests to be carried out, and indoor gym equipment allowed continued exercise. These nondigital tools were more effective in ensuring self-management, while digital help ensured continuous flow of information and connectivity.

DISCUSSION

Principal findings

The COVID-19 pandemic has transformed self-management for our participants. Social distancing and venue closure meant health consumers have had to adopt workarounds, altering self-management. The challenges of living during a pandemic have highlighted the need to understand consumer workarounds, which are likely to have been unnoticed before COVID. The consumer workarounds we saw helped healthcare consumers bypass new barriers against pre-existing tasks. Workarounds of all 4 SAMR categories were observed in the data.

Some consumer workarounds required new knowledge, and differences in learning capability may hinder consumers to successfully create workarounds. New skills and attitudes are known to be significant barriers for self-management.^{24,25} Convenience, comfort, and levels of “extra effort” were therefore the foci of our participants’ reported workarounds,^{19,26} where new digital equipment would be adopted only if a significant gain is perceived.²⁷ For example, while using a telephone did not require new skills, video conferencing software (eg, Zoom, Skype) needed to be “taught” or “set up.” Requirements for new skills saw some older participants continuing face-to-face doctor visits or asking for nurse house visits. If physical artifacts were required for a workaround, such as yoga mats, they required time and money. Redefinition workarounds sometimes required a change in attitude and beliefs. Committing to wearing masks for every excursion outside required a belief in mask efficacy, a contrast to participants who refused to wear masks even at doctors’ practices.

Comparisons with prior studies

Our participants predominantly used informal digital tools not designed for healthcare to bypass barriers in self-management during the pandemic, using new digital tools for only at Substitution (telephone) and Modification (video conferencing, Google Home) levels. Almost all digital workarounds in our cohort therefore involved communication via informal tools such as standard nonsecure telephone. While there were participants who used specific health tools (eg, pharmacy prescription reminder apps, digital blood pressure machines, digital blood glucose meter), those tools were already a part of their routine before the pandemic. Due to our cohort’s older age, convenience and ease was a major factor influencing their choices of digital tools, more than other critical fac-

Table 3. Digital versus nondigital workaround tools during the COVID-19 pandemic

Digital workarounds	Nondigital workarounds
Telephone	Help from other people (eg, neighbors)
Email	Physical delivery of goods
Broadcasting (eg, Radio)	Home visits of healthcare professionals
Video platforms (eg, YouTube)	Physical distancing measures (eg, Wait in the car at clinics)
Social media platforms (eg, Facebook)	More time and energy devoted to cleaning
Messaging platforms (eg, WhatsApp)	Physical barriers (eg, masks, gloves, surgical aprons)
Teleconference platforms (eg, Zoom)	Indoor equipment (eg, treadmills)
Health apps (eg, Medication ordering apps)	
Smart home devices (eg, Google Home)	

tors such as privacy. In fact, the most technologically illiterate groups (those who are >80 years old and are women) had largely resisted all forms of digital tools and opted to physically visit clinics even at the height of the pandemic.

This observation is congruent with existing knowledge in health informatics, where temporary workarounds are conducted by general tools not designed for health services.^{28,29} Common examples are nonsecure phone calls, mobile apps, and video conferencing tools (such as Zoom, Skype, or FaceTime), as we saw in our cohort. It is expected that people would use more simple and familiar tools for informal and less well-defined workarounds.²⁸ Better defined tasks, with clear purposes, processes, and goals, would be more suited for formal and specialized tools.²⁸ However, those clear-cut purposes and needs were not present during the COVID-19 pandemic. Our participants were making up workaround processes and tools on a daily basis during the pandemic. In fact, while some generic online tools were beginning to gain more formalized designs (eg, Secure online websites for online grocery shopping), participants were still more comfortable using the most generalized tool available (eg, Speaking on the phone to a staff member to place a phone order for groceries instead of using the dedicated website). This was especially regarding complex tasks such as communication tasks, which are known to be translate poorly into automation³⁰ and could not be completely replaced by digital tools. Therefore, our finding that digital tools only made a significant difference in communication fits with what we understand about workarounds, and how people would prefer using informal and general tools for less-clearly defined, ad hoc, or very complicated tasks.

Implications for digital support

Demand for digital health support had boomed during the pandemic, rapidly accelerating the use of telehealth.³¹ However, we do not know how consumers are using digital technology in their daily self-management. Our study showed consumers are using digital tools to communicate with others, but not to carry out daily self-management tasks.

Substitution, describing simple replacement of communication media with no changes in the content exchanged, involved many telephone calls to clinicians, especially regarding simple queries or

obtaining straightforward information (eg, blood test results). Participants report telephone consultations were utilized with much greater ease than video conferencing during the pandemic, which matches the Australian national telehealth data that showed a 34% increase of telephone consultations in government-rebated consultations, but only a 1% increase in video consultations.³² Digital support for exchanging simple information would ideally be very similar to standard, familiar telecommunication tools. A more complicated process (eg, an automatic digital triage system instead of a real operator) could in fact decrease the patient's willingness to engage,²⁷ especially for those who may have low digital literacy.

To better support patients of all age and literacy to move to teleconsultation, we therefore must consider how to make telemedicine as convenient as possible for patients. More "traditional" mediums, such as the telephone, would suffice as low fidelity informatic options for patients who are older or less digitally literate. This group requires minimal input and as few new skills as possible. More advanced informatics changes were present in modification and redefinition workarounds, where participants learnt how to use new software, either with the help of younger family members or through dedicated time and effort.

Augmentation workarounds added extra information or context with technology, such as sending audio or visual attachments with emails. These operations are slightly more complicated but still relied on relatively low-end digital skills, such as knowing how to use email. Our cohort reported using general software, such as Word or Excel or email, to record their health status. Similar to substitution workarounds, these tasks support simple goals and need easy-to-use interfaces. We know that difficulties in understanding prescribed digital health technologies is one of the major reasons consumers drop out of telehealth trials or have low engagement.²⁷

Modification and redefinition workarounds may involve more advanced digital technologies. The tools used here include many video software (Zoom, FaceTime, Google Assistant, etc.), monitoring equipment (eg, digital blood pressure meter and glucose meter), and oversized equipment (eg, indoor bicycles and treadmills). Participants in our study highlighted they had specifically studied how to master these new tools and set aside funds or physical space. Many tools in this category are specialized with unique benefits. For health consumers to make an intellectual and financial investment, benefits should exceed costs.²⁷ However, while some health IT designers interpret that in terms of perceived health benefits, literature from the workaround field indicate this needs to be understood in terms of perceived *workflow* benefits.^{33,34} Digital technologies that require intensive learning or resource investment would no longer be considered a workaround, as they would no longer be making the work easier or more convenient.

Strengths and limitations

Our study has the advantage of having collected data during the first COVID-19 lockdown in Sydney, when the Australian government were in the initial phase of subsidizing and encouraging telemedicine. Participants were also actively experiencing the lockdown and were able to report their activities with ease. Moreover, we had a strong personal relationship with the participants as they were recruited for a larger self-management study and had been interviewed 2–3 times before over 3 years, with researchers having thorough background knowledge of the participant's previous routines.

We also acknowledge limitations, such as relying on self-reported data and not being able to verify findings through objective

observation. However, telephone interviews were the most appropriate and safe method to contact participants, especially for our cohort of elderly comorbid patients with living with chronic disease. There is also the limitation that some tasks, such as diet management, can be considered as both patient work and everyday work due to their ubiquitous nature. We have predominantly classified them as patient work in this publication to address their impact on health.

The SAMR model appears to be valuable in categorizing consumer workarounds. This model allows description based on the extent of change in content, context, and mechanisms of work, highlighting the additional work needed to carry out a workaround. The SAMR model was developed in education to assess deviations from traditional paper-based and face-to-face pedagogy in the classroom. These relatively general SAMR definitions needed to be specialized in this study to better capture the different context of changes in patient work at home (see Table 2). Additionally, the original SAMR framework did not take account of any *barriers* or new needs that a workaround is addressing, unlike existing clinical workaround frameworks.^{16,17} This study also identified that participants reported a need to acquire new skills or change beliefs when undertaking workarounds, which is not captured by the original SAMR framework. Lastly, SAMR may need more theoretical development to better describe the barriers that cause these workarounds, as the current framework is descriptive and does not describe any causal processes. Future research could further the theoretical development of the SAMR model to better fit consumer informatics, as the current framework does not convey causal processes that link workarounds with barriers that necessitated the changes.

CONCLUSION

Social isolation during the COVID pandemic highlight the need to better understand the nature of consumer workarounds, especially for patients self-managing chronic illnesses in the community. In this study, we observed consumer workarounds helping consumers bypassing new barriers that arose during the pandemic and had interfered with existing self-management routines. We observed workarounds in all SAMR categories, suggesting workarounds were present in all aspects of self-management, with our participants using digital tools to communicate instead of carrying out daily self-management. “Workarounds are gifts,” because they are signals that there is a mismatch between work as imagined and work as done.²⁸

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AUTHOR CONTRIBUTIONS

KY conducted the interviews, analyzed the data, and wrote the manuscript. EC conceptualized the study and wrote the manuscript. JJ conducted the interviews and analyzed the data. UR analyzed the data. AYSL conceptualized

the study, conducted the interviews, analyzed the data, and contributed to the writing. All authors read and approved the final manuscript.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Journal of the American Medical Informatics Association* online.

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CONFLICT OF INTEREST STATEMENT

None declared.

DATA AVAILABILITY

The data underlying this article (anonymized nVivo files) will be shared on reasonable request to the corresponding author.

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