

Adoption of Digital Mental Health by Professionals Before and During COVID-19: Insights from a Repeated Cross-Sectional Survey

Yara Salim Haddad^{1*}, Nour Ahmad Khalil¹

¹Department of Management, Faculty of Business, American University of Beirut, Beirut, Lebanon.

*E-mail ✉ y.haddad.aub@yahoo.com

Abstract

Following the emergence of the COVID-19 pandemic in early 2020, widespread social distancing measures were enforced, necessitating the rapid adoption of online and digital formats for psychological interventions. This abrupt shift to digital care created a valuable opportunity to examine how it influenced mental health professionals' perceptions and usage of Digital Mental Health (DMH) tools. The present study reports the results of a repeated cross-sectional investigation, conducted through three rounds of a national online survey in the Netherlands. The survey included both open-ended and structured questions addressing professionals' readiness to adopt DMH, frequency of use, perceived competence, and perceived value, with data collected in 2019 (pre-pandemic), 2020 (post-first wave), and 2021 (post-second wave). Including pre-pandemic data provides a rare perspective on the progression from voluntary to mandatory DMH adoption. Additionally, this study revisits the drivers, obstacles, and requirements of mental health practitioners after gaining practical experience with DMH. In total, 1,039 respondents completed the surveys (Survey 1: n = 432, Survey 2: n = 363, Survey 3: n = 244). Findings demonstrate that, relative to the pre-pandemic period, the use, competence, and perceived value of videoconferencing increased significantly. Minor changes were observed for other essential tools that maintained continuity of care, such as e-mail, text messaging, and online screening, whereas more innovative technologies like virtual reality and biofeedback saw little change. Many practitioners reported enhanced DMH skills and recognized multiple benefits, expressing a preference for a blended approach that combines digital and in-person care, particularly in scenarios where clients cannot travel. Conversely, some practitioners remained dissatisfied with technology-mediated interactions and hesitant about future DMH use. Implications for broader DMH implementation and directions for future research are discussed.

Keywords: COVID-19, Digital mental health, eMental health, Mental health professionals, Blended care, Videoconferencing

Introduction

Over recent decades, the role of technology in mental healthcare has been extensively explored. Digital Mental Health (DMH), also called e(Mental) Health, refers to “the use of information and communication technology (ICT)—particularly Internet-related technologies—to support and enhance mental health and mental healthcare” [1]. DMH offers several distinct advantages,

including greater accessibility, reduced travel time and costs, increased flexibility, and enhanced client autonomy [2, 3]. Numerous systematic reviews have compared the effectiveness of DMH with traditional in-person interventions—both as standalone and blended approaches—generally showing comparable therapeutic outcomes [4, 5]. Other research has investigated whether online interventions can sustain adequate therapeutic alliance or rapport, often regarded as essential for positive treatment outcomes, reporting satisfactory findings [6]. Nevertheless, despite these encouraging results, studies consistently note the relatively low integration of DMH in everyday clinical practice [7–9]. Prior research has largely focused on understanding the challenges of implementing eMental Health, highlighting that practitioner adoption [10, 11] is critical, as clinicians

Access this article online

<https://smerpub.com/>

Received: 11 March 2024; Accepted: 07 June 2025

Copyright CC BY-NC-SA 4.0

How to cite this article: Haddad YS, Khalil AN. Adoption of Digital Mental Health by Professionals Before and During COVID-19: Insights from a Repeated Cross-Sectional Survey. *J Med Sci Interdiscip Res.* 2025;5(1):162-78. <https://doi.org/10.51847/W0lvGj9QoS>

are typically less receptive to DMH than clients [12, 13]. Adoption itself is a complex, multi-dimensional process. Rogers [14] proposed a framework defining adoption as a series of stages, including acquisition of knowledge and skills, acceptance, integration into daily practice, actual use, and evaluation. A related concept is adoption readiness, defined as “the degree to which a professional is prepared to use DMH (i.e., has a favorable attitude, motivation, and necessary skills and knowledge)” [15]. Adoption readiness focuses on individual practitioner characteristics, making it less dependent on organizational or external factors.

Research on DMH adoption by professionals has identified multiple barriers to online therapy. Common obstacles include insufficient therapist competence and training, technological issues, concerns over diminished communication affecting therapeutic quality, client characteristics incompatible with DMH, uncertainty in crisis management, privacy and security challenges, and loss of therapeutic control [2, 3, 16]. Interestingly, despite concerns about negative impacts on therapeutic interaction, several studies report that DMH can strengthen the therapeutic relationship by enabling more frequent contact between sessions [3]. Another key factor influencing adoption is practitioners’ belief in the effectiveness and utility of DMH tools [2]. Additionally, enhanced access to care, convenience, efficiency, and reduced travel time are cited as the main advantages contributing to positive attitudes toward DMH [16].

For an extended period, the implementation of DMH in clinical practice remained consistently low [7, 9]. The onset of the COVID-19 pandemic, however, forced a rapid and substantial shift in mental healthcare delivery. Physical distancing requirements compelled most mental health professionals to transition almost immediately to remote care, resulting in widespread adoption of online mental health services [17, 18]. While this period placed considerable strain on both clinicians and clients due to its social and physical consequences, it also provided a unique opportunity to examine how a broader cohort of users—therapists and clients alike—experienced DMH tools.

The practical exposure to DMH during the pandemic could positively influence practitioners’ readiness to adopt these tools for two main reasons. First, prior research indicated that increasing practitioners’ knowledge about DMH can enhance their intention to use it [19]. Second, although direct comparisons of attitudes before and after DMH use are limited, existing studies

generally show increased adoption, including higher acceptance, perceived ease of use, and reduced concerns about low effectiveness or negative impacts on the therapeutic relationship [2]. Conversely, this experience may also reveal the limitations of DMH relative to face-to-face care. Moreover, during COVID-19, DMH use was largely mandated by organizational or governmental directives. Research suggests that initial forced use of an innovation does not reliably predict future voluntary adoption [20], so DMH utilization might revert to pre-pandemic levels once practitioners regain full autonomy. Additionally, the abrupt move to digital platforms often occurred before sufficient technological infrastructure was in place, creating practical challenges such as inadequate hardware or software and unstable internet connections for both practitioners and clients [18].

Over the past two years, numerous studies have examined professionals’ experiences with DMH during the pandemic. A brief synthesis indicates that, overall, practitioners reported positive perceptions of DMH, though this was largely contextual, as it enabled the continuation of practice under crisis conditions [21]. Beyond maintaining continuity of care, the reported benefits generally align with those identified in pre-pandemic research. Challenges in treatment were similar as well; for instance, participants frequently noted the difficulty of missing non-verbal cues during online sessions and managing crises remotely [18, 22]. Early in the transition, access to necessary technology and reliable internet connections posed significant problems [18, 21, 22]. Many professionals also reported increased fatigue from consecutive hours of videoconferencing [18]. Furthermore, protocols for recording treatment sessions and ensuring privacy compliance were often absent initially [21, 22], though these issues generally improved as the pandemic progressed [21].

Most research on the pandemic’s impact on DMH adoption was conducted rapidly to address the unforeseen circumstances [21]. Consequently, these studies often capture practitioners’ perceptions at a single point in time and rely on retrospective reports to compare current DMH use, acceptance, and competence with pre-COVID conditions. However, people are known to exhibit recall bias, tending to remember past attitudes and feelings in a way that aligns with their present experiences [23, 24]. Therefore, such findings should be interpreted cautiously regarding actual changes in adoption. Additionally, many studies are either quantitative or qualitative. Quantitative approaches allow

large, representative samples and statistical comparisons but offer limited insights into the underlying reasons for observed outcomes. Conversely, qualitative studies provide a detailed, in-depth understanding but are less generalizable and cannot easily test differences between samples. Integrating both methods enables triangulation, which helps validate findings, uncover inconsistencies, and use one method's results to interpret the other, leading to a more comprehensive understanding of the data [25].

Current study

This research reports on a repeated cross-sectional survey examining three rounds of an online questionnaire, including both open-ended and structured items, aimed at evaluating how mental healthcare professionals adopt DMH. The study seeks to answer the following questions:

- 1. How have mental health professionals' overall readiness to adopt DMH, their use, skill levels, and perceived benefits of different DMH tools evolved from the period prior to the COVID-19 pandemic through its progression?
- 2. After mandatory exposure to DMH tools, what are the main factors that support or hinder mental health professionals' adoption, and which aspects influence their willingness to use DMH in the future?

To investigate these questions, we compare data collected before the pandemic with data collected during it to understand how this forced experience affected DMH adoption. No study to date has directly analyzed self-reported data from before the pandemic alongside data collected after two pandemic waves. Moreover, while previous research generally focused on DMH in general or on a single tool, often videoconferencing, this study examines multiple DMH tools individually. This enables the identification of differences in adoption patterns depending on the innovativeness of each tool.

Regarding quantitative measures, the study hypothesizes that the use of DMH tools increased from Survey 1 (2019) to both Survey 2 (2020) and Survey 3 (2021) due to social distancing measures (e.g., lockdowns). Following this experience, we also expect higher self-reported competence and greater perceived usefulness of DMH. Finally, these changes are anticipated to result in increased overall adoption readiness over time.

By integrating quantitative and qualitative data, the study not only examines whether changes occurred but also explores the reasons behind them. Insights into experienced facilitators and perceived benefits help identify what encourages or discourages future DMH use. Together, this provides a clearer understanding of the factors driving changes in professional adoption, guiding sustainable implementation and expanding therapeutic possibilities in practice.

Materials and Methods

Design

The present research used a repeated cross-sectional design, with three rounds of a nationwide online survey in the Netherlands. The survey included both closed and open questions regarding mental health professionals' use and adoption of DMH. Data were collected at three time points: Survey 1 (October 2018 – April 2019, pre-pandemic), Survey 2 (June – December 2020, after the first COVID-19 wave), and Survey 3 (June – September 2021, after the second wave). During the latter two periods, lockdowns had been partially lifted, allowing most professionals to meet clients in person again. Nevertheless, strict organizational regulations remained, including hygiene measures, maintaining a 1.5-m distance, wearing face masks while moving, and staying home when experiencing COVID-19 symptoms or after contact with an infected individual. Consequently, some sessions continued online. **Figure 1** illustrates the survey timelines and corresponding pandemic waves.

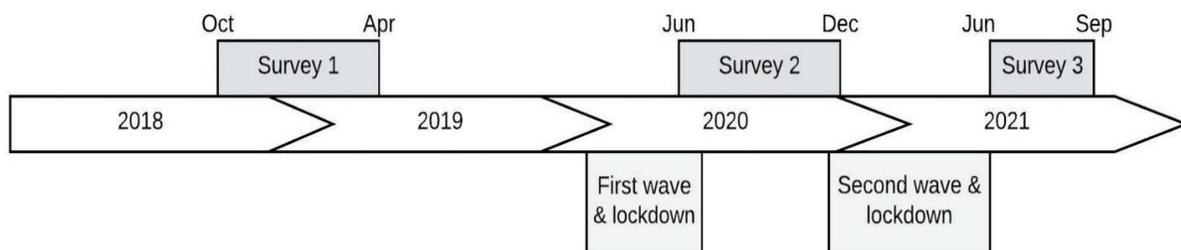


Figure 1. Timeline of surveys and pandemic waves

Participants

The participants targeted in this study were mental healthcare professionals with varying levels of experience in DMH, spanning different roles and areas within the mental healthcare field. Across all three survey rounds, recruitment followed the same procedure: multiple large Dutch mental healthcare organizations were approached. In total, six institutions invited staff via email or internal portals. Additionally, announcements were made through newsletters and websites of three national psychology associations: the Dutch Institute for Psychology, the Dutch Association of Health Psychologists, and the Dutch Association of Independent Psychotherapists. A number of independent practitioners were also contacted through the research team's personal

professional connections. Survey respondents could enter a raffle upon completion, with 12 vouchers of 50 Euros each offered for each survey as incentives.

Across the three surveys, 1,039 professionals participated, with response numbers declining slightly over time (Survey 1: $n = 432$, Survey 2: $n = 363$, Survey 3: $n = 244$). Most participants (63%) were employed in secondary mental healthcare. Other frequently reported domains were forensic services (10%), basic mental healthcare (8%), and children and youth services (7%). No significant demographic differences were observed between the three survey groups. Further demographic details, including gender, age, and professional background, are provided in **Table 1**.

Table 1. Participant demographics across the three surveys: Survey 1 ($n = 432$), Survey 2 ($n = 363$), and Survey 3 ($n = 244$), showing distributions of gender, age, and professional background

Characteristic	Survey 1	Survey 2	Survey 3
Gender			
Male	144 (33%)	95 (26%)	62 (25%)
Female	288 (67%)	268 (74%)	181 (74%)
Age (years)			
Mean (range)	41 (20–69)	39 (18–70)	42 (21–69)
Profession			
Clinical/counseling psychologists & psychotherapists	125 (29%)	133 (37%)	92 (38%)
Psychiatric nurses	140 (32%)	111 (31%)	70 (29%)
Social workers	102 (24%)	68 (19%)	49 (20%)
Expressive therapists (e.g., creative arts, psychomotor)	13 (3%)	8 (2%)	5 (2%)
Physicians (e.g., psychiatrists, GPs, neurologists)	27 (6%)	22 (6%)	15 (6%)
Other (e.g., researchers, team managers)	25 (6%)	21 (6%)	13 (5%)
Years of clinical experience			
Mean (range)	16 (0–43)	14 (0–47)	16 (0–45)
Prior DMH education			
Yes	159 (37%)	142 (39%)	90 (37%)
No	273 (63%)	221 (61%)	154 (63%)

Measures

Use frequency, competency, and perceived value

Participants reported their use, competence, and perceived value for 12 DMH tools: e-mail, text/chat, educational websites, online modules, social media, videoconferencing, monitoring apps, client portals, online screening, wearables/biofeedback, virtual/augmented reality, and domotics. Use frequency was rated on a 5-point scale from 1 (“almost never”) to 5 (“almost every day”). Competency was rated from 1 (“not competent at all”) to 5 (“very competent”), and perceived value ranged from 1 (“not valuable”) to 5

(“very valuable”). Average scores across all 12 tools were computed for each construct.

Adoption readiness

Adoption readiness was measured using the eMental Health Adoption Readiness (eMHAR) Scale [15], comprising 15 items reflecting practitioners' willingness and ability to adopt DMH. Although the scale includes three subscales—perceived benefits/applicability, personal innovativeness, and self-efficacy—only the total score was used here. Responses were rated from 1 (“strongly disagree”) to 5 (“strongly agree”), with negatively worded items reverse-coded. The mean of all

items reflects overall adoption readiness, where higher scores indicate greater readiness. Cronbach's alpha in this study was 0.89.

Barriers, facilitators, and needs

In Surveys 2 and 3, additional items explored barriers, facilitators, and needs encountered when using DMH. These were based on a prior review [3] and two qualitative studies conducted early in the COVID-19 pandemic [18, 26]. Participants evaluated 14 potential barriers, 9 facilitators, and 10 needs, plus an "other" option for unlisted experiences. Each item was answered with "yes" or "no" to indicate whether they had encountered it.

Experiences and perceptions of DMH use

Due to the COVID-19 pandemic between Surveys 1 and 2, Surveys 2 and 3 included open-ended questions about reasons for increased or decreased DMH use and perceived value. Participants were also asked which tools or aspects they intended to continue using post-pandemic. Survey 3 additionally inquired about anticipated DMH use after restrictions were lifted and the reasons behind these expectations. Responses to these items formed the qualitative component of the study.

Background information

Participants provided basic demographic information and details about their clinical practice, including years of professional experience, common client symptoms, interventions offered, and any prior DMH training. Completing the survey required about 15 minutes for Survey 1 and 20 minutes for Surveys 2 and 3 due to the added questions.

Data analysis approach

Examining changes in adoption metrics

To evaluate differences across the surveys in DMH use, perceived value, competency, and adoption readiness, we utilized Welch's F-tests with Games-Howell post-hoc comparisons. Welch's F-test is particularly robust for datasets with unequal sample sizes and variances, which is common in psychological research, while still performing adequately when variance homogeneity holds [27]. The Games-Howell procedure compares mean differences between survey pairs and adjusts for multiple testing. Effect sizes for these comparisons were estimated using Cohen's d s, which applies Bessel's

correction to reduce bias in population variance estimation [28, 29].

Analysis of barriers, facilitators, and needs

To summarize responses regarding barriers, facilitators, and needs in Surveys 2 and 3, we conducted an exploratory factor analysis (EFA) to reduce the 32 items into a smaller set of interpretable factors. All items across the three categories were analyzed together to detect potential relationships among them. The item "Type of treatment/client group" from Survey 2 was excluded because it was later clarified in Survey 3 and thus unsuitable for joint analysis.

We applied a robust weighted least squares estimator appropriate for categorical data and used an Oblimin (oblique) rotation, as many constructs in social science research are expected to correlate [30–32]. Orthogonal and oblique rotations yield similar outcomes when factors are uncorrelated [33]. Model fit was evaluated using RMSEA (<0.07) and CFI (>0.96), which are considered reliable indicators for dichotomous data [30, 34]. Factor loadings greater than 0.30 were interpreted as meaningful (30). Items loading on multiple factors were assigned based on theoretical relevance. Finally, unweighted mean scores per factor were calculated for each respondent for subsequent analyses.

Qualitative data on practitioners' experiences

The open-ended responses regarding practitioners' experiences were analyzed using reflexive thematic analysis [35, 36], following six stages: (1) familiarizing with the data, (2) coding inductively, (3) identifying themes, (4) defining themes, (5) reviewing and refining themes, and (6) reporting final themes and subthemes. The first author performed the initial coding and theme generation, and a second author independently reviewed the outputs. Differences were resolved through discussion to reach a consensus.

Respondents frequently described causal links between adoption-related factors, which were used to create a descriptive model showing potential connections among themes and subthemes.

Software used

EFA was conducted in MPlus 8.6 [37]. All other statistical analyses were performed in SPSS 25, while qualitative coding and theme development were carried out in MAXQDA VERSION 22.1.

Results and Discussion

Adoption readiness, use, perceived value, and competency

Aggregating all tools, significant differences across surveys were observed for use frequency ($F_{2,626.143} = 33.579$, $p < 0.001$), competency ($F_{2,636.17} = 10.15$, $p < 0.001$), and perceived value ($F_{2,623.18} = 6.403$, $p = 0.002$), whereas adoption readiness did not differ significantly ($F_{2,603.82} = 1.958$, $p = 0.142$). Post-hoc analyses showed that use and competency were higher in Surveys 2 ($p < 0.001$ and $p = 0.005$) and 3 (both $p < 0.001$) compared to Survey 1, but not between Surveys 2 and 3. Perceived value increased in Survey 3 compared to Surveys 1 ($p = 0.003$) and 2 ($p = 0.011$), but there was no difference between Surveys 1 and 2.

When examining each tool individually (**Figures 2–4**), videoconferencing exhibited the largest increases in use ($F = 562.565$, $p < 0.001$), competency ($F = 188.681$, $p < 0.001$), and perceived value ($F = 78.92$, $p < 0.001$), with

scores in Surveys 2 and 3 exceeding Survey 1 (all $p < 0.05$; Cohen's $d = 0.8$ – 2.2), but no difference between Surveys 2 and 3. Smaller yet significant improvements were found for e-mail ($F = 7.68$, $p = 0.001$; $F = 21.187$, $p < 0.001$), text messaging ($F = 10.935$, $p < 0.001$; $F = 12.23$, $p < 0.001$), and online screening ($F = 11.413$, $p < 0.001$; $F = 9.652$, $p < 0.001$), with perceived value increasing only for online screening ($F = 8.383$, $p < 0.001$). Post-hoc tests confirmed that these increases occurred from Survey 1 to Surveys 2 and 3 (all $p < 0.05$; Cohen's $d = 0.25$ – 0.5). Changes in other basic tools, such as client portals or monitoring apps, were negligible (Cohen's $d < 0.25$). Innovative tools, including wearables and VR/AR, showed minimal change, except for domotics, which increased significantly in use ($F = 596.355$, $p = 0.001$), competency ($F = 10.664$, $p < 0.001$), and perceived value ($F = 12.087$, $p < 0.001$) between Surveys 1 and 3, with medium effect sizes (Cohen's $d = 0.3$ – 0.4 ; all $p < 0.05$).

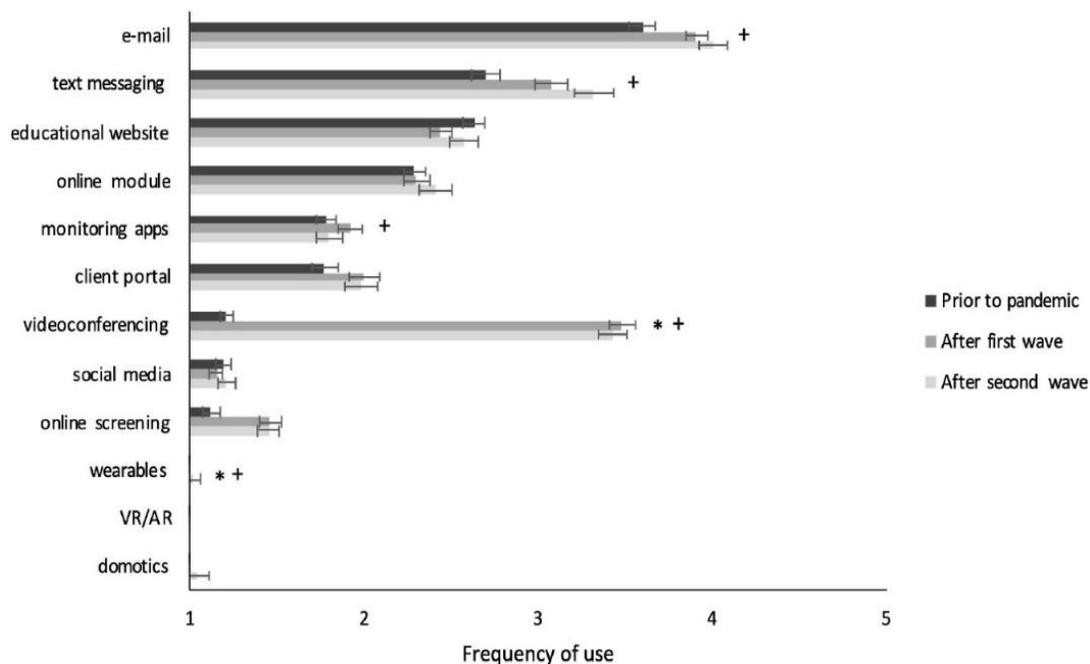


Figure 2. Frequency of individual DMH tool usage across the three survey waves. Asterisks (*) indicate meaningful changes (Cohen's $d > 0.25$) between Survey 1 and Survey 2; plus signs (+) indicate differences between Survey 1 and Survey 3. Error bars represent standard error.

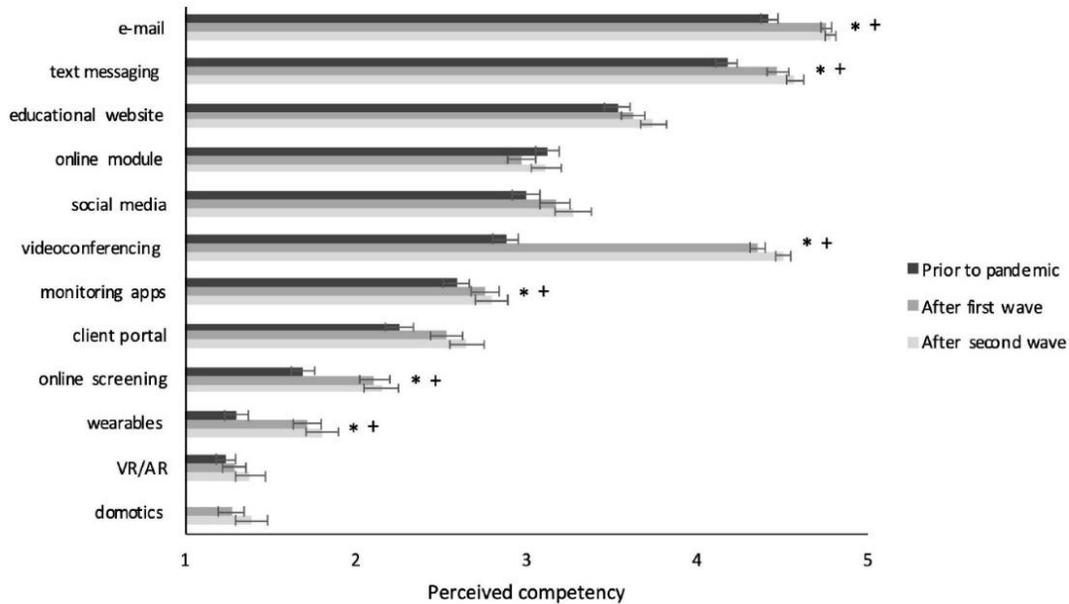


Figure 3. Survey results for perceived competency with each DMH tool. Significant differences (Cohen’s $d > 0.25$) are marked with * (Survey 1 vs 2) and + (Survey 1 vs 3). Standard error is shown by error bars.

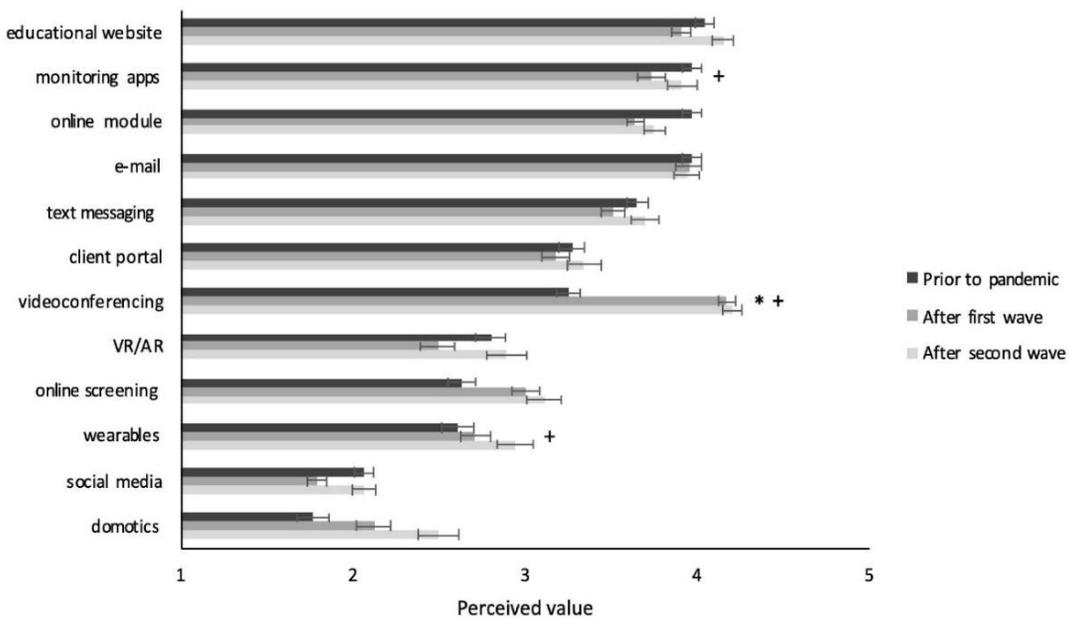


Figure 4. Perceived value of DMH tools by survey. Significant effects (Cohen’s $d > 0.25$) are denoted with * (Survey 1 vs 2) and + (Survey 1 vs 3). Error bars reflect the standard error of the mean.

Barriers, drivers, and needs

An exploratory factor analysis (EFA) was performed on 33 items addressing perceived barriers, facilitators, and needs. A nine-factor solution provided the best combination of theoretical sense, simplicity, and model fit. One item (“Not able to perform physical exercises, e.g., whiteboard or roleplaying”) was removed due to

poor alignment with any factor. Another item (“Technological helpdesk readily available”) was reassigned to a different factor despite a low loading (0.218), as this improved conceptual fit without negatively affecting reliability. The finalized model demonstrated excellent fit indices: $\chi^2(222) = 272.4, p < 0.001; CFI = 0.98; RMSEA = 0.019$.

Four factors combined barriers and needs: Connection quality captured issues with internet stability; Equipment availability reflected access to devices and software; Daily work process included workload management and online hour registration; Privacy concerned adherence to privacy regulations. Two factors represented only barriers: Empathic interaction involved challenges in creating empathy online and loss of non-verbal cues; Client-related barriers reflected clients' skills, resources, home environment, or reluctance toward DMH. Implementation needs included requirements such as additional software, training, or peer knowledge sharing. Two factors represented facilitators: Practical benefits

(e.g., reduced travel, flexible schedules, efficient sessions) and Client-oriented benefits (e.g., greater client engagement and openness).

The most frequently reported barriers/needs were Connection quality (76% Survey 2, 74% Survey 3), followed by Client-related barriers (60%, 64%), Empathic interaction (52%, 46%), and Privacy (53%, 45%). Less frequently noted were Implementation needs (43% both surveys), Equipment availability (32%, 36%), and Daily work process (27%, 19%). Among facilitators, Practical benefits were more common (46% both surveys) than Client-oriented benefits (21%, 20%). Results are displayed in **Figure 5**.

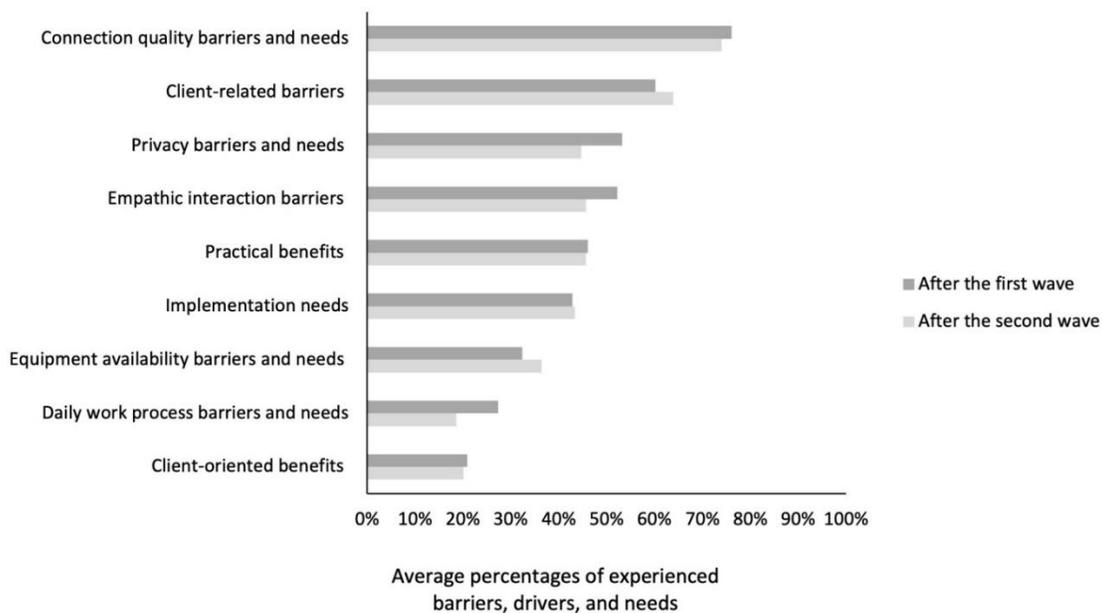


Figure 5. Average proportions of barriers, drivers, and needs reported in Surveys 2 and 3.

Qualitative results: practitioners' experiences and perceptions

Analysis of open-ended responses revealed three overarching themes with seven subthemes: experience gained through enforced use, expanded understanding

through lived experience, and strengthened opinions on future DMH utilization. These themes and subthemes, along with potential connections, are illustrated in **Figure 6**.

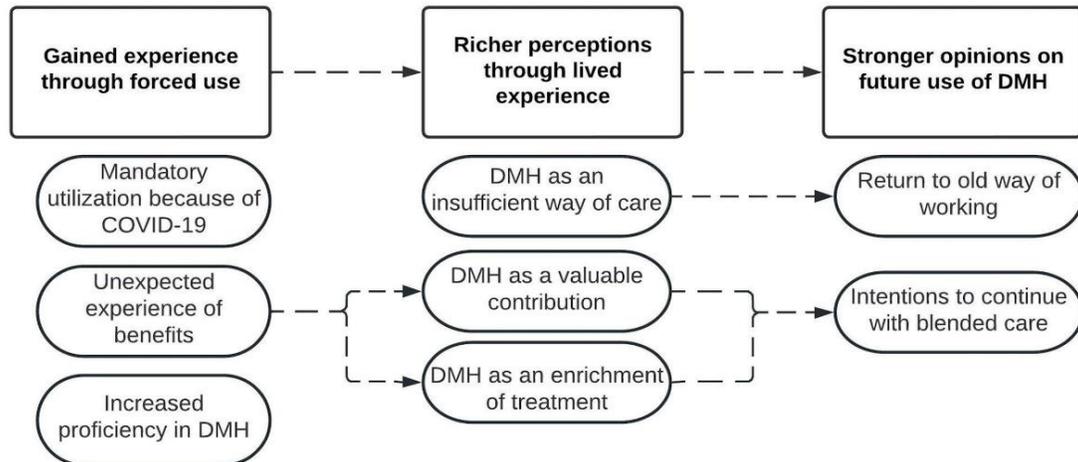


Figure 6. Conceptual model of themes and subthemes derived from practitioners' responses on DMH. Squares = main themes, ovals = subthemes, dotted lines = potential interconnections.

Experience gained through enforced use

DMH use mandated by COVID-19

Although a subset of participants had already integrated DMH into practice pre-pandemic, roughly half reported that organizational mandates prompted their adoption due to governmental regulations requiring remote work and a reduction in in-person interactions.

"More use of eHealth because of regulations requiring us to work from home as much as possible." (s3p26)

Discovering unexpected benefits

Nearly 50% of respondents indicated that DMH became more useful than anticipated. Many highlighted that despite initial reluctance, direct experience revealed advantages they had not foreseen, which strengthened their appreciation for DMH tools.

"Only now, it has become apparent which advantages using eHealth brings." (s2p300)

Several participants reported that online sessions could match or even improve the quality of client interactions compared to face-to-face sessions, and that therapeutic effectiveness was maintained.

"Beforehand, I was skeptical about its efficacy, afraid that it would impede the therapeutic relationship or that the treatment would be disrupted. Neither is the case." (s2p162)

Enhanced skills with DMH

About half of the respondents reported that their experience during the COVID-19 pandemic significantly improved their expertise and confidence in using DMH. Many noted that they had become more aware of the

potential applications of DMH and understood better how to integrate these tools into treatment. Several practitioners explained that, prior to the pandemic, they either lacked the opportunity or did not prioritize developing these skills, but the circumstances forced them to quickly acquire the necessary proficiency in order to continue client care.

"Through hands-on use, I became far more competent with DMH and developed practical skills." (s3p210)

"I became considerably more skilled in videoconferencing, which will allow me to continue using it effectively after COVID-19 if needed." (s2p107)

Broadened perspectives through practical experience

DMH as a valuable resource

The most frequently cited benefit was that DMH allowed therapy to continue uninterrupted. This was particularly emphasized during lockdown periods or when clients were in quarantine and face-to-face sessions were impossible.

"During times when all in-person treatments stopped, I was very grateful that some therapies could continue via eHealth." (s2p105)

Although this advantage was highlighted in the pandemic context, many practitioners considered it equally important for future use, for instance, when clients cannot attend sessions due to illness or other obligations.

Consistent with quantitative findings, the second most common advantage mentioned was saving time, particularly travel time for clients and occasionally for practitioners. Many also appreciated the flexibility in

scheduling, which was especially useful for brief check-ins, evaluations, or multi-person meetings.

“Reducing travel for both clients and myself allows much more flexibility, which I see as a major benefit.” (s3p62) Another benefit often reported was the reduced threshold for client contact. For some, online communication made it easier to initiate treatment, thereby improving accessibility.

“Some clients find it easier to take the step toward treatment.” (s2p65)

Additionally, online sessions allowed for more frequent, shorter interactions, which enhanced communication and supported stronger therapeutic relationships.

“Short, repeated contacts with clients are possible online, which actually facilitates recovery.” (s3p195)

In some cases, clients themselves requested online sessions, motivated by practical considerations like travel reduction or psychological comfort in their own environment.

DMH as an enrichment to therapy

Consistent with the relatively low frequency of client-oriented benefits in quantitative results, changes in client behavior were reported less often. Nevertheless, around 5% of participants observed that clients became more active and autonomous in their treatment, which they considered a unique strength of DMH.

“Clients feel more empowered and take greater ownership of their care.” (s2p116)

A similar proportion of practitioners noted that DMH expanded their therapeutic toolkit, allowing them to offer new interventions and tailor treatment to individual client needs. These respondents viewed DMH as an enhancement to their practice.

“DMH greatly enriches my options as a therapist, such as online modules, messaging, and short videoconferencing sessions.” (s3p62)

DMH as an inadequate method for some clients

Despite these positive experiences, a notable portion of practitioners reported dissatisfaction with online therapy. They felt that, for some client groups, DMH added little or no value, and in certain cases may have negatively impacted client well-being or recovery.

Practitioners frequently noted that certain clients were not suitable for DMH, either due to a lack of technology or digital literacy, or because they strongly preferred in-person interaction.

“Both before and during COVID-19, my clients lacked the devices and skills needed for eHealth. Therefore, I continued with face-to-face sessions, as I had prior to the pandemic.” (s2p353)

There was substantial variability in the types of client groups that practitioners reported as challenging to manage via online methods. Generally, those working in inpatient settings noted that DMH offered limited added value since most interactions were inherently face-to-face. Nevertheless, some acknowledged benefits, such as online modules that allowed clients to independently engage in recovery activities, or videoconferencing to involve a client’s social network. Opinions regarding other client populations were more divided: older adults, young children, clients on the autism spectrum, suicidal clients, and group therapy sessions were frequently mentioned as less suitable for DMH. However, for each of these groups, some practitioners shared positive experiences, noting that online approaches could work effectively.

Several practitioners emphasized the importance of in-person contact for forming deeper therapeutic connections. They often attributed this to the absence of non-verbal cues, including subtle facial expressions or body language, which are difficult to perceive online.

“Deeper connections are made face-to-face, and not via a screen.” (s2p66)

More defined views on future DMH use

Practitioners’ hands-on experience shaped more concrete perspectives on if, when, and how DMH would be incorporated into their practice after the pandemic.

Plans to maintain blended care

Around three-quarters of respondents reported intentions to continue using DMH tools, especially videoconferencing, as a supplement to face-to-face treatment. These practitioners generally considered DMH a valuable enhancement to therapy, citing situations where it had demonstrable benefits.

“I think that being introduced to it because of COVID-19 has made us, mental healthcare professionals, but also our clients, more aware of when it can be of added value.” (s3p40)

Most practitioners indicated a preference for predominantly in-person treatment, supplemented with online elements as needed, to accommodate clients’ individual preferences, abilities, and circumstances.

Videoconferencing was highlighted as a key tool for both client sessions and staff meetings.

Reverting to previous practices

A smaller subset of practitioners reported that their experience with DMH during lockdown reinforced their reluctance to use it. Nearly one-fifth explicitly stated they planned to return to exclusively face-to-face sessions as soon as possible. These participants generally considered DMH insufficient for providing care, using it during the pandemic only out of necessity.

“I started using eHealth, mostly videoconferencing, because I had to. As soon as face-to-face contact was possible, I quickly went back to doing this again.” (s3p235)

For this group, client-related barriers and challenges with therapeutic interactions were particularly influential. Interestingly, although quantitative data indicated these barriers were among the most frequently reported across the sample, qualitative responses revealed they were decisive in determining future abandonment of DMH for only a portion of participants. Unlike the quantitative findings, technical issues such as connectivity problems or lack of devices, as well as privacy concerns or productivity pressures, were rarely cited as the main reasons for avoiding DMH.

Key findings

This repeated cross-sectional study, encompassing three waves of national online surveys, examined mental healthcare professionals' adoption of DMH before and during COVID-19. As anticipated, DMH usage sharply increased following the pandemic's onset, but this effect was mostly limited to basic tools, particularly videoconferencing, which were essential for maintaining treatment continuity. In contrast, more advanced DMH technologies, such as Virtual Reality and biofeedback, did not experience comparable uptake. Additionally, the need to provide care remotely prompted practitioners to develop the competencies required to use these critical tools effectively, reflected in higher self-reported proficiency with this specific set of technologies.

Increases in perceived value were largely limited to the most essential DMH tools during the pandemic, namely videoconferencing and online screening. Despite clear changes in frequency of use, perceived competency, and perceived value, general adoption readiness at the group level did not show a significant shift. Nevertheless, qualitative responses indicated that practitioners' views

on DMH were influenced by the experience, with many reporting positive effects while others noted challenges. Reported benefits primarily concerned maintaining continuity of care during COVID-19 and increased scheduling flexibility. Some practitioners also highlighted improvements in treatment quality, often because online modalities reduced barriers to contact and expanded therapeutic options. Commonly reported barriers included technological problems, but client-specific challenges and difficulties establishing satisfactory therapeutic interactions appeared to be more decisive in shaping intentions for future DMH use. Although a small portion of practitioners strengthened their reluctance toward DMH, nearly three-quarters of respondents indicated they intended to continue a blended approach, combining face-to-face sessions with DMH tools in contexts where added value is evident.

Both quantitative and qualitative findings largely corroborate and extend previous research. Our data confirm that remote care experienced rapid uptake internationally (17), but this was primarily for tools essential to maintain treatment, particularly videoconferencing, as well as e-mail, text messaging, and online screening. As expected, not only did use increase for these tools, but self-reported competency also improved. Qualitative feedback reinforced that skills were gained through practical experience. These results suggest that increased use of certain DMH tools, even if initially driven by necessity, contributed to higher proficiency. While these data are correlational and do not imply causality, it is likely that enhanced skills increase the likelihood of future use, and repeated use in turn supports skill development.

A strong link between usage and perceived value was generally absent, except for videoconferencing and, to a lesser degree, online screening, which saw notable increases in both use and perceived importance during the pandemic. This suggests that while skill acquisition and experience may be necessary, they are insufficient to generate perceived value, particularly when adoption is mandated rather than voluntary. Qualitative reports highlighted that several practitioners still considered certain online tools less effective than in-person delivery, regardless of their skill level, and therefore did not regard them as valuable.

Contrary to our expectations, overall adoption readiness did not increase despite higher usage, competency, and, to some extent, perceived value for specific tools. This implies that adoption readiness is influenced by more

than proficiency and perceived value. Factors such as motivation, proactivity, personal innovativeness, and beliefs about DMH's general applicability [15] were likely unaffected by mandatory use. This may explain why professionals did not adopt more innovative DMH technologies, including virtual reality or wearables: only the tools necessary for continuity of care were used. Practitioners appear to have developed "need-to-know" skills—learning just what was required to maintain treatment during in-person restrictions. Given the extreme pressures during the pandemic, it is understandable that experimentation with new technologies was minimal. Time and resource constraints have long been cited as barriers to DMH adoption [19], and the pandemic likely intensified these limitations. Future research should investigate whether openness to innovative tools increases once the care environment stabilizes.

Although general adoption readiness scores remained unchanged, qualitative data clearly showed shifts in practitioners' perceptions. Many were pleasantly surprised by the capabilities of DMH and became more convinced of its benefits. The findings indicate that providing high-quality care remains practitioners' primary motivation, and when DMH supports that goal, they are more receptive to its use. This does not suggest, however, that practitioners intend to fully replace face-to-face interactions with online sessions; most still prefer in-person sessions as the primary mode of treatment and consider adding online components only when they offer specific advantages (e.g., reducing travel or assigning homework). This aligns with prior research suggesting that a blended approach, ideally with about 75% face-to-face and 25% online treatment, is preferred [38]. Although blended care has shown positive outcomes, definitions and applications vary widely. Ideally, online and offline elements should be fully integrated and balanced within treatment, yet in practice, online components are often supplementary to the main face-to-face intervention [39].

For some practitioners, the period of enforced DMH use appeared to reinforce a preference for traditional face-to-face care and increased reluctance toward online modalities. A key reason for favoring in-person contact was the perception that remote communication often hinders the quality of therapeutic interactions and could negatively affect the therapeutic relationship—a concern consistently reported in earlier studies [2, 3, 16]. While these issues were noted across the sample, the degree to

which practitioners considered them problematic varied considerably. Philosophical critiques of technology-mediated communication emphasize its limitations, including the inability to fully perceive the shared context and to physically sense the room's atmosphere and the reactions of others present [40]. Consequently, remote interactions may always feel inferior compared to in-person encounters.

The absence of direct eye contact is thought to contribute to the sense of impoverished communication [41], alongside the restricted use of interpersonal distancing, which is crucial for regulating personal space and social interactions [42, 43]. Given that therapeutic interaction and relationship quality are central to successful outcomes [6], future research should focus on understanding the precise differences between face-to-face and remote interactions in therapy, and identify the respective advantages and disadvantages of each. Such insights could help clarify which interventions require co-presence, and which can be effectively delivered remotely. Additionally, this knowledge may inform improvements to DMH tools, such as correcting eye gaze to simulate direct eye contact or providing real-time indicators of clients' arousal levels [44].

Another commonly reported barrier involved practitioners' strong belief that DMH is unsuitable for certain client groups. Interestingly, there was considerable variation in which populations were deemed appropriate for online care. Suitability appears highly case-dependent, as previously observed in studies of DMH for clients with autism spectrum disorder [45]. Many clients, particularly in secondary mental healthcare, present with complex problems that do not allow for rigid, protocol-driven use of DMH tools [38]. This underscores the need for flexible selection of DMH tools tailored to individual clients' needs, abilities, and preferences, rather than implementing a uniform approach for entire client groups. Consequently, opting not to use any DMH tool should remain a valid choice. Given the mixed perceptions of client group suitability, further research is needed to clarify what works for whom and at what stage of treatment, with the first review on this subject recently published [46]. Suitability may also depend on practitioners' professional role and clinical setting. In our study, qualitative responses suggested differences in appropriateness of certain DMH tools between inpatient and outpatient contexts, but research in inpatient settings remains limited, and comparative studies are scarce [47]. More research is

needed to identify which tools are most appropriate in specific settings to optimize the use of available DMH interventions.

Implications for mental healthcare practice

The findings also provide several practical considerations for integrating DMH tools in mental healthcare. Our results suggest that fundamental requirements, such as robust technological infrastructure and procedures for privacy and administrative tasks, were largely established during the pandemic. However, barriers intrinsic to the treatment itself—particularly client characteristics and the therapeutic relationship—remain and may have become more prominent. The insights gained could inform best practices or guidelines linking client characteristics to specific DMH tools, helping practitioners understand which tools to apply and when. Such guidance should also address contraindications, outlining scenarios in which particular tools may be less suitable. One proposed instrument supports shared decision-making between practitioners and clients regarding DMH use [39].

Just as DMH is not universally applicable for all clients, it is also not a one-size-fits-all solution for practitioners. Previous research indicates that perceived barriers, facilitators, and needs differ depending on where a practitioner is in the adoption process [48]. This highlights the importance of designing DMH tools that can be adapted to individual adoption levels, such as offering both basic and advanced versions tailored to the practitioner's experience and confidence.

The present study indicates that the COVID-19 pandemic appears to have catalyzed a shift toward more blended approaches in treatment. However, embedding blended care sustainably within mental healthcare practice requires several additional steps. Notably, the rapid development of (essential) DMH tools and the enhanced practitioner skills reported in this study were primarily aimed at ensuring continuity of care under pandemic conditions. This often meant delivering the entire treatment remotely. While some benefits from this ad hoc adaptation are relevant for routine practice, long-term implementation of DMH demands further requirements, both in terms of tools and practitioner competencies. Since blended care—mixing face-to-face and online components—is likely to become standard, practitioners need to be adept at deciding when to apply each modality and how to engage clients in these decisions [38]. Implementing blended care also requires adjustments in

workflow and time management, such as allocating time to provide feedback on online homework. Now that the immediate crisis pressures have eased, practitioners should have opportunities to explore optimal use of DMH tools, for instance, by fine-tuning the frequency of reminders and feedback. Training in DMH should also become an integral component of professional education, including hands-on practice with various tools and instruction on integrating them effectively into treatment. Regarding DMH tools themselves, further development is needed to fully embed them in professionals' daily workflows. Enhancing interoperability among applications could improve ease of use, a crucial factor in innovation adoption [49]. Moreover, improving advanced tools such as Virtual Reality and wearables, and integrating them into DMH platforms, can expand practitioners' capacity to tailor interventions to individual client needs.

Limitations

Several limitations of this study should be acknowledged. While the unique circumstances of the COVID-19 pandemic offered a rare opportunity to examine how hands-on experience with DMH affects professional adoption, the extraordinary context also introduced methodological challenges. A primary goal of this study, beyond tracking dramatic changes in DMH use during a pandemic, was to assess whether first-hand experience with these tools could lead to lasting changes in usage and perceived value—for instance, via increased self-efficacy or recognition of DMH effectiveness in client interactions. However, since the use of DMH tools was largely mandatory as the only feasible way to provide care, it is unclear how these experiences would generalize to voluntary use. During the pandemic, the perceived value of DMH was often compared to no treatment at all, which may have inflated assessments. In contrast, when use is voluntary, practitioners may compare it to their traditional face-to-face care, likely altering perceived value. Previous studies also suggest that compulsory adoption does not necessarily predict future voluntary use [20], and the absence of change in general adoption readiness may indicate that observed attitude shifts are temporary. Comparative future research is needed to determine whether these changes and intentions to continue blended care persist once face-to-face interactions are unrestricted.

Additionally, this study used a repeated cross-sectional design, so each survey sampled different participants.

Consequently, some observed differences could partially reflect pre-existing variations between groups [50]. However, we used consistent sampling strategies across the three surveys and verified that demographic characteristics did not differ significantly, supporting the reliability of our findings. General adoption readiness scores were also similarly distributed across samples.

Another limitation concerns changing frames of reference regarding technology use. Whereas in-person meetings were previously standard, remote communication became dominant during lockdowns, altering perceptions of social interaction both in daily life and clinical practice. Similarly, the pandemic accelerated digital technology development: many tools improved, and new applications were introduced. What was considered “high use” or “advanced” before the pandemic may have been viewed as “average use” or “basic” in later surveys, potentially biasing results. More broadly, repeated cross-sectional designs cannot fully account for external influences, limiting the ability to draw strong causal conclusions [51].

Finally, this study did not investigate the type or extent of support participants received from their organizations. Even though most organizations were largely consistent across the three surveys, and quantitative analyses remained stable when controlling for organization type and profession, variations in organizational facilitation could have contributed to differences in practitioners’ experiences and perceptions. Likewise, the study was conducted exclusively in the Netherlands, and while our results align with recent studies on practitioners’ experiences during the COVID-19 pandemic [21], differences may exist in countries that implemented alternative pandemic policies or where the technological infrastructure to support remote care was less developed. Moreover, some items assessed professionals’ perceptions of clients’ experiences, leaving uncertainty about how closely these perceptions match clients’ actual experiences. Generally, research shows that clients report high satisfaction with DMH, particularly when it reduces travel time, although individual differences in preferences and competencies are substantial [12]. Finally, all findings are based on self-report measures.

Conclusion

The onset of the COVID-19 pandemic in spring 2020 required an immediate global shift toward the use of DMH tools in mental healthcare. This abrupt transition

created a unique opportunity to examine how hands-on experience with DMH—albeit mandated—impacted practitioners’ adoption of these tools. By collecting comparable data both before the pandemic and at two points during it, the present study generated a highly detailed dataset, allowing an unprecedented analysis of the adoption process. Results indicate that the experience gained during the pandemic partially influenced practitioners’ adoption: professionals acquired knowledge and skills regarding when and how to use key DMH tools and developed firsthand insights into various benefits and limitations of these tools in practice. Reported intentions to continue or discontinue blended care may suggest a potential enduring shift toward more digitally integrated treatment in mental healthcare. However, given the forced nature of online tool usage and the substantial pressures on the mental health system during COVID-19, it remains uncertain whether gradual, voluntary exploration of DMH under normal conditions would produce similar adoption patterns. Regardless, further development of both DMH technologies and practitioners’ competencies with a wider range of tools, including their effective integration into treatment, will be essential for the long-term success of blended care.

Acknowledgments: None

Conflict of Interest: None

Financial Support: None

Ethics Statement: None

References

1. Riper H, Andersson G, Christensen H, Cuijpers P, Lange A, Eysenbach G. Theme issue on E-mental health: a growing field in internet research. *J Med Internet Res.* (2010) 12:e74. 10.2196/jmir.1713
2. Connolly S, Miller C, Lindsay J, Bauer MS. A systematic review of providers’ attitudes toward telemental health via videoconferencing. *Clin Psychol Sci Pract.* (2020) 27:e12311. 10.1111/cpsp.12311
3. Stoll J, Müller J, Trachsel M. Ethical issues in online psychotherapy: a narrative review. *Front Psychiatry.* (2020) 10:993. 10.3389/fpsy.2019.00993
4. Barnett P, Goulding L, Casetta C, Jordan H, Sheridan-Rains L, Steare T, et al. Implementation of

- telemental health services before COVID-19: rapid umbrella review of systematic reviews. *J Med Internet Res.* (2021) 23:e26492. 10.2196/26492
5. Shigekawa E, Fix M, Corbett G, Roby D, Coffman J. The current state of telehealth evidence: a rapid review. *Health Aff.* (2018) 37:1975–82. 10.1377/hlthaff.2018.05132
 6. Norwood C, Moghaddam N, Malins S, Sabin-Farrell R. Working alliance and outcome effectiveness in videoconferencing psychotherapy: a systematic review and noninferiority meta-analysis. *Clin Psychol Psychother.* (2018) 25:797–808. 10.1002/cpp.2315
 7. Hennemann S, Beutel M, Zwerenz R. Ready for eHealth? Health professionals' acceptance and adoption of eHealth interventions in inpatient routine care. *J Health Commun.* (2017) 22:274–84. 10.1080/10810730.2017.1284286
 8. Glueckauf R, Maheu M, Drude K, Wells B, Wang Y, Gustafson D, et al. Survey of psychologists' telebehavioral health practices: technology use, ethical issues, and training needs. *Prof Psychol Res Pract.* (2018) 49:205–19. 10.1037/pro0000188
 9. Van Der Vaart R, Atema V, Evers A. Guided online self-management interventions in primary care: a survey on use, facilitators, and barriers. *BMC Fam Pract.* (2016) 17:27. 10.1186/s12875-016-0424-0
 10. Whitten P, Mackert M. Addressing telehealth's foremost barrier: provider as initial gatekeeper. *Int J Technol Assess Health Care.* (2005) 21:517–21. 10.1017/S0266462305050725
 11. Ross J, Stevenson F, Lau R, Murray E. Factors that influence the implementation of e-health: a systematic review of systematic reviews (an update). *Implement Sci.* (2016) 11:146. 10.1186/s13012-016-0510-7
 12. Vosburg R, Robinson K. Telemedicine in primary care during the COVID-19 pandemic: provider and patient satisfaction examined. *Telemed J E Health.* (2022) 28:167–75. 10.1089/tmj.2021.0174
 13. Nicholas J, Bell I, Thompson A, Valentine L, Simsr P, Sheppard H, et al. Implementation lessons from the transition to telehealth during COVID-19: a survey of clinicians and young people from youth mental health services. *Psychiatry Res.* (2021) 299:113848. 10.1016/j.psychres.2021.113848
 14. Rogers E. Diffusion of innovations. 5th ed. New York, NY: The Free Press; (2003). p. 512.
 15. Feijt M, de Kort Y, Westerink J, Bierbooms J, Bongers I, IJsselsteijn W. Assessing professionals' adoption readiness for eMental health: development and validation of the eMental health adoption readiness scale. *J Med Internet Res.* (2021) 23:e28518. 10.2196/28518
 16. Davies F, Shepherd H, Beatty L, Clark B, Butow P, Shaw J. Implementing web-based therapy in routine mental health care: systematic review of health professionals' perspectives. *J Med Internet Res.* (2020) 22:e17362. 10.2196/17362
 17. Vogt E, Welch B, Bunnell B, Barrera J, Paige S, Owens M, et al. Quantifying the impact of COVID-19 on telemedicine utilization: retrospective observational study. *Interact J Med Res.* (2022) 11:e29880. 10.2196/29880
 18. Feijt M, De Kort Y, Bongers I, Bierbooms J, Westerink J, IJsselsteijn W. Mental health care goes online: practitioners' experiences of providing mental health care during the COVID-19 pandemic. *Cyberpsychol Behav Soc Netw.* (2020) 23:860–4. 10.1089/cyber.2020.0370
 19. Donovan C, Poole C, Boyes N, Redgate J, March S. Australian mental health worker attitudes towards cCBT: what is the role of knowledge? Are there differences? Can we change them?. *Internet Interv.* (2015) 2:372–81. 10.1016/j.invent.2015.09.001
 20. Agarwal R, Prasad J. The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. *Decis Sci.* (1997) 28:557–82. 10.1111/j.1540-5915.1997.tb01322.x
 21. Appleton R, Williams J, Vera San Juan N, Needle J, Schlieff M, Jordan H, et al. Implementation, adoption, and perceptions of telemental health during the COVID-19 pandemic: systematic review. *J Med Internet Res.* (2021) 23:e31746. 10.2196/31746
 22. De Witte N, Carlbring P, Etzelmueller A, Nordgreen T, Karekla M, Haddouk L, et al. Online consultations in mental healthcare during the COVID-19 outbreak: an international survey study on professionals' motivations and perceived barriers. *Internet Interv.* (2021) 25:100405. 10.1016/j.invent.2021.100405
 23. Coughlin S. Recall bias in epidemiologic studies. *J Clin Epidemiol.* (1990) 43:87–91. 10.1016/0895-4356(90)90060-3

24. Jaspers E, Lubbers M, De Graaf N. Measuring once twice: an evaluation of recalling attitudes in survey research. *Eur Sociol Rev.* (2009) 25:287–301. 10.1093/esr/jcn048
25. Greene J, Caracelli V, Graham W. Toward a conceptual framework for mixed-method evaluation designs. *Educ Eval Policy Anal.* (1989) 11:255–74. 10.3102/01623737011003255
26. Bierbooms J, van Haaren M, IJsselsteijn W, de Kort Y, Feijt M, Bongers I. Integration of online treatment into the “new normal” in mental health care in post-COVID-19 times: exploratory qualitative study. *JMIR Form Res.* (2020) 4:e21344. 10.2196/21344
27. Delacre M, Leys C, Mora Y, Lakens D. Taking parametric assumptions seriously: arguments for the use of Welch’s F-test instead of the classical F-test in one-way ANOVA. *Int Rev Soc Psychol.* (2019) 32:13. 10.5334/irsp.198
28. Cohen J. *Statistical power analysis for the behavioral sciences.* 2nd ed. Hillsdale: Lawrence Erlbaum Associates; (1988).
29. Lakens D. Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Front Psychol.* (2013) 4:863. 10.3389/fpsyg.2013.00863
30. Hair J, Black W, Babin B, Anderson R. *Multivariate data analysis.* 7th ed. Essex: Pearson; (2014).
31. Fabrigar L, Wegener D, MacCallum R, Strahan E. Evaluating the use of exploratory factor analysis in psychological research. *Psychol Methods.* (1999) 4:272–99. 10.1037/1082-989X.4.3.272
32. Costello A, Osborne J. Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Pract Assess Res Eval.* (2005) 10:1–9. 10.7275/jyj1-4868
33. Floyd F, Widaman K. Factor analysis in the development and refinement of clinical assessment instruments. *Psychol Assess.* (1995) 7:286–99. 10.1037/1040-3590.7.3.286
34. Finch W. Using fit statistic differences to determine the optimal number of factors to retain in an exploratory factor analysis. *Educ Psychol Meas.* (2020) 80:217–41. 10.1177/0013164419865769
35. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* (2006) 3:77–101. 10.1191/1478088706qp063oa 32100154
36. Braun V, Clarke V, Hayfield N, Terry G. Thematic analysis. In: Liamputtong P. editor. *Handbook of research methods in health social sciences.* Singapore: Springer; (2019). p. 843–60. 10.1007/978-981-10-5251-4_103
37. Muthén L, Muthén B. *Mplus user’s guide.* 8th ed. Los Angeles, CA: Muthén & Muthén; (1998-2017).
38. van der Vaart R, Witting M, Riper H, Kooistra L, Bohlmeijer E, van Gemert-Pijnen L. Blending online therapy into regular face-to-face therapy for depression: content, ratio and preconditions according to patients and therapists using a Delphi study. *BMC Psychiatry.* (2014) 14:355. 10.1186/s12888-014-0355-z
39. Wentzel J, van der Vaart R, Bohlmeijer E, van Gemert-Pijnen J. Mixing online and face-to-face therapy: how to benefit from blended care in mental health care. *JMIR Ment Health.* (2016) 3:e9. 10.2196/mental.4534
40. Dreyfus H. *On the internet.* London: Routledge; (2002). 10.4324/9780203754955
41. Grondin F, Lomanowska A, Jackson P. Empathy in computer-mediated interactions: a conceptual framework for research and clinical practice. *Clin Psychol Sci Pract.* (2019) 26:17. 10.1111/cpsp.12298
42. Hayduk L. Personal space: where we now stand. *Psychol Bull.* (1983) 94:293–335. 10.1037/0033-2909.94.2.293
43. Argyle M, Dean J. Eye-contact, distance and affiliation. *Sociometry.* (1965) 28:289. 10.2307/2786027
44. Feijt M, De Kort Y, Westerink J, IJsselsteijn W. Enhancing empathic interactions in mental health care : opportunities offered through social interaction technologies. *Annu Rev CyberTherapy Telemed.* (2018) 16:25–31.
45. Adams L, Adamo N, Hollocks M, Valmaggia L, Brewster A, Watson J, et al. Research in Autism Spectrum Disorders Examining clinicians’ concerns delivering telemental health interventions directly to autistic individuals during COVID-19. *Res Autism Spectr Disord.* (2022) 94:101956. 10.1016/j.rasd.2022.101956
46. Schlieff M, Saunders K, Appleton R, Barnett P, Vera San Juan N, Foye U, et al. Synthesis of the evidence on what works for whom in telemental health: rapid realist review. *Interact J Med Res.* (2022) 11:e38239. 10.2196/38239
47. Sander J, Bolinski F, Diekmann S, Gaebel W, Günther K, Hauth I, et al. Online therapy: an added value for inpatient routine care? Perspectives from

- mental health care professionals. *Eur Arch Psychiatry Clin Neurosci.* (2022) 272:107–18. 10.1007/s00406-021-01251-1
48. Feijt M, de Kort Y, Bongers I, IJsselsteijn W. Perceived drivers and barriers to the adoption of eMental health by psychologists: the construction of the levels of adoption of eMental health model. *J Med Internet Res.* (2018) 20:e153. 10.2196/jmir.9485
49. Venkatesh V, Thong J, Xu X. Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS Q.* (2012) 36:157. 10.2307/41410412
50. Rafferty A, Walthery P, King-Hele S. Analysing change over time: repeated cross sectional and longitudinal survey data. Colchester: UK Data Service; (2015). p. 25.
51. Wang X, Cheng Z. Cross-sectional studies. *Chest.* (2020) 158:S65–71. 10.1016/j.chest.2020.03.012