

# Exploring the Role of App Features in Providing Continuity of Care to Users on a Digital Mental Health Platform (Wysa): A Retrospective Study of Real World Evidence

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## Abstract

**Background:** Despite digital mental health services growing at a rapid pace to address global mental health needs, there exist challenges of low engagement and attrition. Ensuring continuity of care in the digital context can positively impact mental health care delivery and adherence to treatment, thus establishing digital mental health interventions (DMHIs) as a viable option for mental health support.

**Objective:** This study aimed to examine the impact of adjunct app features of the mental health app Wysa, and their ability to promote engagement and adherence with the text-based coaching sessions.

**Methods:** This retrospective mixed-methods observational study was based on real-world app data from users (n=1210) who subscribed to text-based sessions with mental health coaches (MHCs) between 1st February and 31st July 2022. Their engagement with the adjunct app features, such as brief interventions with the conversational agent (CA), self-management tools, and journaling was analyzed quantitatively using descriptive and inferential statistics. Acceptability of the app features was also assessed using qualitative feedback data.

**Results:** Findings demonstrated high usage of the adjunct app features which allowed communication with the MHCs in between sessions. The thematic analysis captures user experiences of helpfulness within the application and with the MHCs. Mann-Whitney test indicated that users who accessed one or more features completed significantly more sessions compared to users who did not use any feature ( $W=154085.0$ ,  $P<.001$ ,  $rB=0.73$ ) with a large effect size. Odds ratio analysis indicated that users were almost thrice as likely to complete sessions after using the adjunct app features ( $OR=2.98$ , 95% CI [2.63, 3.37],  $P<.001$ ).

**Conclusions:** The inclusion of adjunct app features enhances continuity in care delivery between sessions, and boosts engagement and adherence to digital mental health interventions. Further efforts are needed to improve care continuity and expand the applicability of DMHIs to meet global mental health demands.

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## Original Manuscript

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**Conclusion:** The inclusion of adjunct app features enhances continuity in care delivery between sessions, and boosts engagement and adherence to digital mental health interventions. Further efforts are needed to improve care continuity and expand the applicability of DMHIs to meet global mental health demands.

**Keywords:** wysa; continuity of care; relational continuity; digital mental health interventions; DMHIs; conversational agent; mental health coaches

## Introduction

The global burden of mental health disorders has increased significantly over the past decade. The World Health Organization (WHO) estimates about 970 million people were living with a mental disorder in 2019 [1]. The prevalence of depression and anxiety disorders has significantly increased since the COVID-19 pandemic [1]. As the demand for mental health support continues to rise globally [2], health systems have remained largely under-resourced to meet this growing need. Availability of mental health services remains widely inaccessible, unaffordable, and inadequate. Social stigma around mental health disorders further widens the gap between access and care leaving a significant number of people without timely and adequate mental health support [3]. Studies estimate that only a third of people suffering from depression disorders receive formal mental health care globally, signifying the urgent need for innovation for offering timely support and equitably delivering appropriate care [4].

Furthermore, healthcare access and delivery systems have become increasingly fragmented due to the rise of specialties, and the involvement of multiple care providers that lead to an increase in inefficiencies and widens the care gap. It is also often hindered by a shortage of resources, such as trained professionals, especially in low-resource settings [5–7]. Fragmentation of systems creates a complex environment for patients to navigate and adversely affects continual access to necessary care and overall health outcomes of patients [8]. A cohesive, interconnected, and efficient system is especially necessary to address the care needs of patients with complex physical and mental health challenges [9,10].

Continuity of care, as a concept, focuses on a patient-centered approach to enhance the quality of care delivered by coordinated services [11–13]. It is the support that an individual receives

throughout the process of care delivery, within and outside the space of a consultation session with a health professional [11]. Providers and patients emphasize the role of continuity in decreased symptom severity and enhanced health outcomes [9,14].

This practice relies on relational continuity which is “the longitudinal therapeutic relationship between a patient and one or more individual professionals” [13,15]. In mental health, 17% of patients suggest that developing a therapeutic alliance with their care providers is the most helpful aspect of treatment [16] which relies on the need to access necessary information, maintain an ongoing patient-therapist collaboration, and have access to self-management options [17,18]

Digital mental health interventions (DMHIs) have emerged as a compelling solution to bridge the continuity gap due to their ability to increase access across geography and time of day [19]. They offer users low-cost support at their convenience, without requiring appointments or transportation [20–22]. These can often become the bridge in creating an ecosystem of care when patients receive remote support from mental health professionals.

This mixed methods study examines this ecosystem of care, termed as ‘continuity of care’ within the paper through real-world data from the mental health app, Wysa, to explore the following objectives: (1) The utilization and acceptability of the adjunct features on the application among users who had sessions with mental health coaches (MHCs) on a text-based platform; (2) The relationship between the usage of adjunct features on user engagement and adherence to sessions with MHCs.

## Methods

### App Background

Wysa is a digital mental health app that has been publicly available since 2016. The app’s direct-to-consumer version is anonymous for users and consists of an AI-enabled conversational agent (CA), weekly sessions with MHCs, asynchronous messaging with MHCs, and CBT-based brief interventions. All Wysa CA resources have been clinically validated by licensed mental health professionals.

The features within this app are not a replacement for face-to-face psychotherapy and are not used for diagnosis, prognosis, treatment, or to provide any type of state-regulated mental health services in the client’s country of residence. Those who express suicidality or self-harm are signposted to appropriate helpline services. The Wysa CA is free for all users, while access to certain tools and



sessions with the MHCs are paid features.

### **Wysa App Features**

#### **Mental Health Coaching (MHC)**

This service connects users to qualified mental health and well-being professionals, who have undergone rigorous in-house training to provide legal, ethical, and clinically safe psychological support and mental health care. The MHCs are trained psychologists with masters' or doctoral-level training. A scheduled session lasts 30-45 minutes and consists of live messaging with the assigned MHC on the app.

#### **Adjunct App Features**

##### **Asynchronous Communication with MHC (Journaling)**

Users who subscribe to sessions with MHCs also have the option to send messages to their assigned MHC in between scheduled sessions to receive continued support. The MHC typically responds within 24 hours.

##### **Conversational Agent (CA)**

The AI-enabled CA, called Wysa, is designed to provide a therapeutic virtual space for user-led conversations through AI-guided listening and support. It leverages evidence-based cognitive-behavioral therapy (CBT) techniques. User conversations occur with a free-text CA supported by models developed using natural language processing (NLP) and natural language understanding (NLU). The CA delivers self-management tools, drawing upon techniques derived from various schools of therapy, including cognitive-behavioral therapy (CBT), acceptance and commitment therapy (ACT), and mindfulness-based approaches. The tools cover a wide range of interventions to address difficulties such as anxiety, depression, anger management, and sleep-related concerns amongst others.

#### **Ethical Considerations**

Wysa's privacy policy and terms of service strictly ensure the anonymity and privacy of its users. Users can directly access the app without registration, with no personally identifying information (PII) collected during app use. Further, any inadvertently shared PII (such as name, nationality, location, gender etc.) is redacted from the backend. Thus, only anonymized data was used in the research.

The current study is a retrospective analysis of real-world data from a non-clinical anonymized population and is thereby exempt from registration in a public trial registry, according to the revised

common rule by the Office of Human Rights Protection (OHRP) [23]. The study was conducted in accordance with standard ethical practices.

## **Study Design and Sampling**

This study followed a retrospective observational design on real-world data of users from 1st February to 31st July 2022. The inclusion criteria for this study was users who subscribed to text-based sessions with MHCs during the study period. This resulted in a sample of 1,210 users.

## **Data Analysis**

### **Objective 1: Usage and Acceptability of Sessions with MHCs and Adjunct App Features**

The usage metrics of the features (sessions with the CA, self-management tools, journaling frequency, and sessions with MHCs) were analyzed using descriptive statistics. The acceptability of these features was assessed using thematic analysis [24] of feedback provided by the users.

### **Objective 2: Impact of the Adjunct App Features on Engagement and Adherence with MHC sessions**

Inferential statistics were used to examine whether the adjunct app features improved engagement and adherence to MHC sessions. Normal distribution of the data was assessed using the Shapiro-Wilk Test for normality and since the data was not normally distributed, groupwise differences in completion of sessions with MHCs between feature users and users who did not utilize features was tested using the Mann-Whitney Test. Further, an odds ratio (OR) analysis was conducted to explore whether using the adjunct app features (exposure) resulted in completion or non-completion of the subsequent session with the MHC (outcome).

## **Results**

### **Objective 1: Usage and Acceptability of Adjunct App Features and Sessions with the MHCs**

#### **Sessions with Mental Health Coaches (MHCs)**

For the 1,210 users included in the sample, a total of 10,172 sessions were scheduled with MHCs on the app between 1st February 2022 and 31st July 2022. Of these scheduled sessions, 6,948 sessions (68.31%) were completed, and 3,224 sessions (31.69%) were either missed or canceled by the user. Each user scheduled and completed an average of 8.4 sessions (SD=10.5), and 6.9 sessions (SD=8.19) respectively. User helpfulness of MHC sessions was assessed using quantitative feedback

from 8404 sessions obtained on a scale of 1-3, out of which 7410 sessions (88.17%) were found to be very helpful.

## Usage of Adjunct App Features

### *Asynchronous Communication with MHC (Journaling)*

The journaling feature was utilized by 813 users (67.19%) who sent an average of 133.11 messages per user over the study period, and 12.56 (SD = 11.91) messages per user per journaling session. Some users provided feedback that this feature gave them opportunities to express their thoughts and emotions beyond the sessions. One stated how their “*sessions are very helpful whenever (they) use the journal.*”

### *Conversational Agent*

129 users (10.66%) utilized the CA feature in this period, with an average of 8.5 exchanges (SD=10.28) with the CA. The average rating given to the CA was 4.06 out of 5, largely indicating positive feedback. Additionally, 29 users (2.40%) provided qualitative feedback, commenting on the helpfulness of the CA. For instance, one user said, “*Wysa helps me see the brighter side of things.*” Many users also highlighted the therapeutic relationship, commenting that the CA was “*comforting*” and “*helpful*” in rethinking and “*breaking negative thought cycles.*” However, a few users also felt that the CA was “*too robotic*” and “*limited*”. Self-management tools delivered by the CA were used by 67.52% of the users, with each user utilizing 10.51 tools on average (SD=25.34). The most utilized tools were the mindfulness-based interventions, sleep and stress management tools among all available tools. One of the users shared, “*I liked the idea of having tools and steps to help me move forward with my goals as well as helping me cope with unwanted isolation.*”

### **Qualitative Feedback on MHC sessions**

The thematic analysis of qualitative feedback (n=959) on Wysa’s mental health coaching sessions provided by 322 users yielded two major themes: *Quality of Services*, and *Personal Growth and Development*.

### **Access to Support and Safe Spaces**

Users positively described the quality of services and continued *support received* from Wysa’s MHCs and *establishment of an emotionally safe space through the app*.

Users often felt truly understood and attributed their progress to their MHCs, who they describe as caring, trustworthy, and compassionate. *“My therapist has helped me make huge progress in my capacity to handle life and difficult situations and I am constantly learning from her. Her support has made a big difference in my life.”* emphasized a user.

A user also stated that it is *“great to have a safe space where I can share my thoughts and feelings”* while another user expressed their gratitude for a trusting space for expression and emotional regulation, *“Thank you. It’s actually difficult to open up about these things and thank you for this very safe space to do so.”*

### **Personal Growth and Development**

The users also attributed personal growth and development to the MHC sessions stating that it helped improve self-esteem, confidence, and skill building. One user reported, *“This session really helped me refocus on strengths and rebuild my self-esteem.”* Another user emphasized how MHC sessions were *“helping me recognize my wins and that I am able to calm myself down and make rational decisions really helped boost my confidence in myself.”*

Positive response to MHC support was also noted as users reported enhanced self-awareness and learning skills such as goal setting, reframing dysfunctional thoughts, adopting diverse perspectives for actions and behaviors, and to *“see the kind of harshness I project towards myself”* as described by a user.

Furthermore, users also highlighted specific requests and advice they sought from their MHCs such as *“some tips for building boundaries before my next shift”* or *“more concrete plans that I can act on”*. This indicated specific types of the type of personalized and continual care and support the users sought from their trusted MHCs.

### **Objective 2: Impact of the Adjunct Features on Engagement and Adherence**

An analysis was conducted to examine the impact of Wysa’s app adjunct features on user adherence to MHC sessions. The analysis compared users who utilized one or more of the adjunct app features and users who accessed sessions with MHCs without utilizing any other app feature. The Mann-Whitney test indicated that the adjunct app feature users (N= 1042, Mean= 6.57, SD=8.2) completed significantly more sessions (W= 154085.0,  $P < .001$ ,  $r_B = 0.73$ ) with a large effect size, compared to users who did not utilize any features (N=171, Mean= 0.55, SD= 0.95).

An odds ratio was calculated to explore whether using one or more of the adjunct features (such as the CA, self-management tools, or the journaling feature) in between sessions with the MHCs increased the likelihood of completing subsequent sessions. Results indicate that the odds of completing the subsequent session increased significantly when users utilized any of the adjunct features (OR= 2.98, 95% CI [2.63, 3.37],  $P<.001$ ). Thus, users were almost thrice as likely to complete their next session with their MHC after using the app features than when they did not use any feature in between sessions.

## Discussion

### Principal Results

This study explores the utilization of a digital mental health intervention, Wysa, using real-world data to understand its relationship with improving user adherence and engagement with mental health coach (MHC) sessions. The study results indicate that users who engaged with the chatbot and its integrated brief interventions are significantly more likely to engage with subsequent MHC sessions compared to those who do not use these features. These findings support recent studies where patients have demonstrated a higher level of acceptability, symptom reduction, and readiness to access help after the usage of a brief digital intervention.

DMHIs are a scalable solution that support the effective expansion of access to mental health resources to wider populations [25] and can enhance relational continuity within care provision [26]. Previous studies have found that human support, text-based communication [27,28], integration of conversational agents [29], and self-management tools [30] can facilitate the development of a therapeutic alliance, improve continuity of care and increase engagement with the DMHIs [26].

Asynchronous journaling with the MHCs, a text-based messaging feature, was used the most, providing insight into the need to be able to communicate outside of the session. It has been suggested that the features supporting text-based communications are an effective means of maintaining continued contact between patients and care providers, which enables the timely exchange of vital information and needs and develops a strong working alliance [31,32].

The high utilization of self-management tools has been seen to provide a holistic care environment and promote a sense of agency and responsibility among patients [33]. Self-management tools in mental health care have been established as a cost-effective resource [34] that improve overall patient outcomes [35] when offered in adjunct to standard-of-care therapies. Our study corroborates

these findings that users notably engage with self-management tools and integrating them in DMHIs is a vital component to establish a sustained therapeutic relationship.

More recently, AI-based CAs have emerged as a compelling solution that can provide a sense of constant presence and comfort as they help integrate disparate aspects of a digital platform [36,37]. A CA-monitored user interface can be a personalized tool and relevant information, self-management resources, reminders for adherence, and a platform to effectively monitor symptoms to support continuous care delivery to patients [38,39]. Similarly, high patient uptake and utilization of Wysa's AI-based conversational agent were also noted in our study, leading to improved overall engagement with the MHC sessions, suggesting its ability to support the development of a therapeutic alliance.

Improving user engagement and ensuring continuity of care is essential to maximize the potential of DMHIs [40,41]. Research conducted in traditional mental health services also finds that providing resources that enhance continuity of care between treatment sessions improves engagement and adherence with overall treatment cycles, and reduces the need for frequent hospital visits [42–46]. Improved relational continuity is also associated with better overall mental health outcomes and reduction in symptom severity in patients with severe mental health and psychiatric disorders further highlighting the necessity of integrating the construct in mental healthcare delivery mechanisms [15,47]

This study, therefore, has important implications for the design and development of DMHIs as well as the broader mental health services. It highlights the need to consider a holistic approach and overall quality while designing digital interventions to deliver mental health care. As demonstrated in this study, adjunct features such as evidence-based self-management tools, AI-based conversational agents, and journaling features can be effective tools to provide continuous support that can be leveraged to improve patient adherence and engagement with app-based DMHIs. These features can enable sustained therapeutic relationships between patients and their MHCs in a digital environment, support client empowerment, and improve the quality of mental health care delivered through DMHIs [46]. Thus, DMHIs could be designed to incorporate features based on similar principles, to increase their effectiveness, improve user satisfaction, and maximize their application as an effective task-sharing tool. Future research should investigate other methods of enhancing continued care delivery systems in the context of digital mental health

## Limitations

This study, to our knowledge, is unique in its approach of using real-world evidence to examine

whether the provision of certain adjunct app features in DMHIs can support building therapeutic relationships and improve overall patient engagement. Moreover, the approach draws its strength from the objectivity of its methodology. The qualitative feedback reported further adds to the richness of information by providing nuanced user perspectives. However, the study also has several limitations. Firstly, we were unable to measure differences in patient clinical outcomes of patients and changes in symptom severity by utilization of adjunct app features due to the limitations of the dataset.

However, this research lays the groundwork for a more comprehensive exploration of continuity of care within the context of DMHIs. Subsequent studies can delve into the experiences and perspectives of service providers and users along with prospective trials to explore feature usage that enables continuity in the care delivered. Further, DMHI services can also benefit from research using standardized methods for assessing continuity of care in the digital context, which in turn requires further investigations and guidelines. Future research could, therefore, examine how providing adjunct features on a mental health app can impact overall engagement and outcomes for individuals with mental health concerns, along with comparative investigations on the effectiveness of different adjunct features in increasing engagement and adherence.

To successfully scale mental health services to meet growing public mental health demands, it is necessary to build comprehensive digital mental health platforms that encompass various services such as coaching services, provide personalized knowledge and information, and support self-management [19,48]. The positive associations between developing relational continuity and improved clinical outcomes for individuals with mental health concerns underscore the importance of ongoing efforts to enhance care continuity [10] in the digital context.

## Conclusions

The utilization of DMHIs as a powerful tool to expand access to mental health coaches and services has increased substantially. The provision of additional features like an AI-enabled conversational agent, self-management tools, and free communication platforms can improve the effectiveness of DMHIs in delivering continued care to patients outside of sessions with mental health coaches. Further exploration is needed to assess factors that can support a strong therapeutic relationship, build a holistic care environment for DMHIs, and subsequently improve mental health outcomes.

## Acknowledgments

CS designed the study. CS, SM, DD, and RT worked on the quantitative and qualitative data analysis aspects of the study and contributed to the review and final presentation of the manuscript. CS and SM wrote the first versions of the manuscript. CS and RT completed the final version and prepared the final review of the manuscript. All authors contributed to the article and approved the submitted version.

## Conflicts of Interest

CS, DD, SM, and RT are employees of Wysa.

## Abbreviations

ACT: Acceptance and Commitment therapy

AI: Artificial Intelligence

CA: Conversational Agent

CBT: Cognitive Behavioural Therapy

DMHI: Digital Mental Health Interventions

MHC: Mental Health Coaches

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