

# Understanding the use/non-use of an internet-based intervention complementing standard depression treatment: A qualitative study of user's experiences

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## Abstract

**Introduction:** There is sufficient evidence about the effectiveness of internet-based interventions; however, the users' level of adoption and utilization remains low, with this phenomenon requiring adequate explanation.

**Objective:** The aim of this qualitative study was to explore the users' perceptions and experience of a web-based program (ASCENSO), designed to complement (usual) in-person depression treatment.

**Method:** Twelve participants of the ASCENSO program, comprised of adult individuals ( $M = 44.3$ ,  $SD = 13.4$ ) of both genders (67% women) undergoing treatment for depression, were interviewed through semi-structured interviews. The data obtained from these interviews were analyzed utilizing a constructivist grounded theory approach. The interviews were transcribed and analyzed by trained coders. A constant comparative analysis of emergent themes was conducted.

**Results:** These show that users employ and appreciate the program when their interaction with it emulates a "humanized relationship," that is, when the program is proactive in assisting users with their requests and when it responds in a pertinent and individualized manner to their emotional states and needs.

**Conclusions:** Our findings highlight the challenges associated with the development of algorithms capable of attracting different potential users. These should be designed to generate a virtual relationship that emulates human interaction and targets the characteristics of each user, for example, considering the specific phenomenology of their health condition, their present emotional states, and perceived needs. Elements that will vary as mental symptomatology evolve.

## Keywords

major depressive disorder, eHealth, internet-based intervention, qualitative research, users' perception, patient acceptance of healthcare

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## Introduction

There is a wide consensus about the usefulness of eHealth programs applied to mental healthcare,<sup>1</sup> due to their ability to reach a large number of people, even in remote locations. This is particularly important nowadays, given the impact of COVID-19 pandemic,<sup>2</sup> which led to a generalization of the use of internet technology for mental healthcare.<sup>3</sup> However, the utilization level of the available programs is usually lower than expected<sup>4–7</sup>; therefore, it is relevant to explore the subjects' reasons for their use or non-use.

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Although both psychotherapy and psychoeducational interventions delivered through the internet are e-mental health solutions that address shortcomings of traditional treatment services such as limited therapist resources, high cost, lack of accessibility, and stigma,<sup>8–10</sup> they are not free of their own use barriers.<sup>11</sup>

In fact, despite the evidence on the effectiveness of these interventions, especially in depression treatment,<sup>12–14</sup> several studies have shown that internet-based interventions (IBIs) for mental health problems have high dropout and non-adherence rates.<sup>4–7,15–17</sup> For example, Melville et al.<sup>17</sup> reported that dropout ranged from 2% to 83% for a variety of adults' psychiatric disorders, while Christensen et al.<sup>4</sup> indicated that dropout ranged from 1% to 50% when only anxiety and depression symptoms were taken into account. Showing that a relevant proportion of the potential participants will not use the intervention, stop using it after some time, or at least, don't use it as the IBI developers expected.<sup>6,18</sup>

Consequently, it has become increasingly relevant to understand why people use (or do not use) IBIs, in order to develop comprehension-oriented models that could improve their usage and, thus, their effectiveness.<sup>6,19</sup> To do so, studies that include qualitative methodologies are especially relevant to capture the users' experiences.<sup>19,20</sup> Researchers in several European countries and in Australia have conducted qualitative studies exploring the motivations, expectations, and experiences of users of IBIs for depression and anxiety, aimed at understanding the reasons for non-adherence and attrition.<sup>20–25</sup> Bendelin et al. concluded that people do not benefit equally from self-help IBIs. Some users wished to have more contact with a therapist or another real person, and they reported that support was lacking or inadequate.<sup>20</sup> Patients of Gerhards et al.'s<sup>22</sup> study reported that the program's content was difficult to translate and apply to their daily life, affecting their adherence to the program. Also, several participants reported wanting some kind of support from "another real person," who could help them generate self-discipline, meet their needs for personal contact, or give feedback. Darvell et al.<sup>25</sup> reported that even though the program was described as highly interactive and "tailor-made," patients felt it was insufficiently suited to their individual needs and impersonal, due to the absence of a human response (particularly during emotional crises). On the ground of these results, it could be stated that there are multiple reasons behind the low use of internet-based programs for psychological disorders.

An additional core element of IBI non-use is the experience of a mismatch between what the program offers and the emotional state or necessities of users.<sup>21,23</sup> For example, Johansson et al. found that participants who stopped adhering to an IBI felt that the reading skills and concentration required to understand its contents surpassed their capacities, and they expressed that the lack of face-to-face contact did not match their necessity to share their problems with another person.<sup>23</sup>

These studies emphasize that users' subjective experiences, particularly the interplay between their expectations and perceived needs and how these are satisfied by IBIs, together with the availability of human support, play a relevant role in adherence to these programs. The question arises whether these elements apply – or not – to other sociocultural settings such as Latin America, a region where few studies on this phenomenon have been conducted<sup>26</sup> and where IBIs' adherence problems have also been reported.<sup>26–28</sup> The study in this different context could amplify the phenomenon's understanding.

The IBI whose results are presented in this paper is called ASCENSO, following its acronyms in Spanish: Apoyo, Seguimiento y Cuidado de ENfermedades a partir de Sistemas Operativos (support, monitoring, and disease care, through operating systems).<sup>27</sup> Its German version was adapted to be implemented on Chilean population.<sup>27</sup> A recent effectivity study indicated that their participants had limited use of it,<sup>28</sup> generating the following research questions: what user's perceptions and experiences of the online program might encourage its use? and on the contrary: what user's perceptions and experiences might discourage its use? The present study analyzes qualitative data that answers these questions and offers, based on this information, a culturally anchored explanatory model of subject–technology interaction that can inform the design of digital mental health interventions.

## Method

This exploratory–descriptive study employs qualitative methodology and was nested in the ASCENSO study.<sup>28</sup> ASCENSO is an IBI for patients who are in treatment for depression, which was implemented in adjunct to the usual face-to-face treatment. A two-arm parallel group was conducted in an outpatient private mental healthcare center in Santiago de Chile (2017–2019). A total of 167 adult patients, aged between 18 and 64 years, were included in the study. Additional inclusion criteria were a clinical diagnosis of a current major depressive episode by a staff psychiatrist or mental health-trained physician according to the International Classification of Diseases confirmed by the Spanish Version of the Mini-International Neuropsychiatric Interview (MINI) and internet access. Exclusion criteria were a previous suicide attempt (past 10 years); hospitalizations were associated with a major depressive disorder (MDD) diagnosis; psychotic episodes; bipolar affective disorder; severe cognitive disability; drug abuse or dependence; antisocial, schizotypal, or borderline personality disorder; serious medical illness; and insufficiency in the Spanish language.

Further information on the ASCENSO can be found in the study trial.<sup>28</sup>

**Table 1.** Participant characteristics.

Socio-demographics	
Age, <i>M(SD)</i> [range]	44.25 years (13.42) [23–72]
Female, <i>n</i> (%)	8 (67)
Highest educational level, <i>n</i> (%)	
Secondary	1 (8%)
University	10 (83%)
Postgraduate	1 (8%)
Activity	
Student	1 (8%)
Homemaker	1 (8%)
Worker	10 (83%)
Depressive symptoms, <i>M(SD)</i>	24.00 (9.42)
Internet access	
At home, <i>n</i> (%)	11 (92%)
At work, <i>n</i> (%)	9 (75%)
By cellphone, <i>n</i> (%)	11 (92%)
Self-perceived internet expertise <sup>a</sup>	
Basic, <i>n</i> (%)	–
Intermediate, <i>n</i> (%)	8 (67%)
Advanced, <i>n</i> (%)	3 (25%)
Expert, <i>n</i> (%)	1 (8%)
ASCENSO usage indicators	
Response rate of monitoring system, <i>n</i> (%)	
100%	2 (17%)
More than 75%	7 (58%)
25–75%	1 (8%)
Less than 25%, <i>n</i> (%)	2 (17%)
Log-in on website, <i>n</i> (%)	7 (58%)

(continued)

**Table 1.** Continued.

Socio-demographics	
Alarm system (received phone calls), <i>M(SD)</i> [range]	1,42 (2.07) [0–7]
Log-in on online consultation, <i>n</i> (%)	5 (42%)
Schedule online consultation, <i>n</i> (%)	1 (8%)

<sup>a</sup>Self-perception of internet expertise: basic, “being able to turn on my computer, connect to the internet, and send emails”; intermediate, “being able to use some computer programs and find what I want on the internet”; advanced, “being able to use several computer programs and learn to use a new one”; expert, “being able to program a computer, install operating systems, and configure networks.”

## Participants

In the present study, we focused only on the patients who had access to the ASCENSO website (84 patients of the intervention group, IG). Following the indications of the Ethics Committee, all IG patients ( $n = 77$ , seven of IG participants had requested not to be contacted) were invited by email to participate in this qualitative study. Of the 77, only one refused to participate. Eighteen participants expressed their interest, with 12 interviews ultimately being conducted, since theoretical saturation was achieved at this point.

The 12 participants (Table 1) were of both genders (67% women), were 44.3 years old on average ( $SD = 13.4$ ), had university-level studies (92%), and had paid jobs (75%).

To include people with different website utilization levels, the participants' selection was originally based on maximal variation.<sup>28</sup> We employed the participants' response rate within the symptom monitoring system as a proxy for the utilization rate. Nevertheless, the people who used the website the least (response rate of <74%) were less willing to take part in the qualitative study, being underrepresented in this study. However, the participants had a similar used profile of the ASCENSO platform to the one reported by the total IG of the clinical trial. Most of the interviewees (83%) answered irregularly the biweekly symptom monitoring questionnaires. Also, 58% of them logged in at the ASCENSO website, and 42% of them accessed the “online consultation section” (but only one participant reserved an appointment). Finally, a total of 17 suicide alerts were triggered by seven (58%) interviewees.

## Ethics approval and informed consent

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. This project was approved by the Ethical Committee of the mental health center where the patients received

TAU treatment (Psicomédica, Chile). The participants signed an informed consent form. This document includes information about the study objectives. Participants did not receive other information about the study or the interviewer. Each interviewee received monetary compensation (US\$13.6)

### *The ASCENSO intervention and its use*

The **ASCENSO IBI** includes psychoeducational information and interactive modules intended to promote patient self-care and adherence to treatment (see Figure 1). It includes biweekly **monitoring of patient symptomatology**, feedback on symptom progression, as well as indications for symptom self-management or consultation with a professional when required. Users receive an email with a link to the questionnaire. Feedback on the questionnaire is also received through mail. Questionnaires can also be accessed through the ASCENSO website. Additionally, the website includes an **online consultation section**, where patients can schedule a 30-min session with a psychologist, conducted in a private text-based chat room or over the phone. Finally, for managing emergencies, patients may read the **emergency section** on the website, which includes standard information on what to do and whom to contact in a crisis. Also, an **alarm** for the professional team can be activated when the monitored response indicates possible suicidality. In these cases, the patient automatically receives an email instructing to contact the health center where he/she is being treated and is then referred to the “emergency section” (previously mentioned). In parallel, the professional responsible at the health center receives a notification, evaluates the patient’s situation and symptom report, and acts in consequence, for example, calling them by phone.<sup>28</sup>

Perez et al. (2021) reported that ASCENSO users answered only 49% of the biweekly symptom monitoring questionnaires. Of the IG participants, 29% accessed the “online consultation section,” but only three participants reserved an appointment by chat and three by phone, and 25% accessed the “emergency section.” Finally, a total of 167 suicide alerts were triggered by 51 participants (65% of IG).<sup>29</sup>

### *Procedures*

Qualitative data were collected through semi-structured interviews, conducted online in Santiago, Chile, between November 2019 and March 2020. Interviews were conducted between 4 and 25 months after the end of participation in ASCENSO.

The semi-structured interviews followed a thematic script<sup>29,30</sup> constructed, covering a broad range of questions regarding the patients’ experience of use and perceptions of different components of the ASCENSO website. The script was piloted in the first two interviews and then

adjusted by adding specific questions about the sections of the ASCENSO’s website that were not spontaneously mentioned (see Thematic Script in Appendix 1, Supplementary Material).

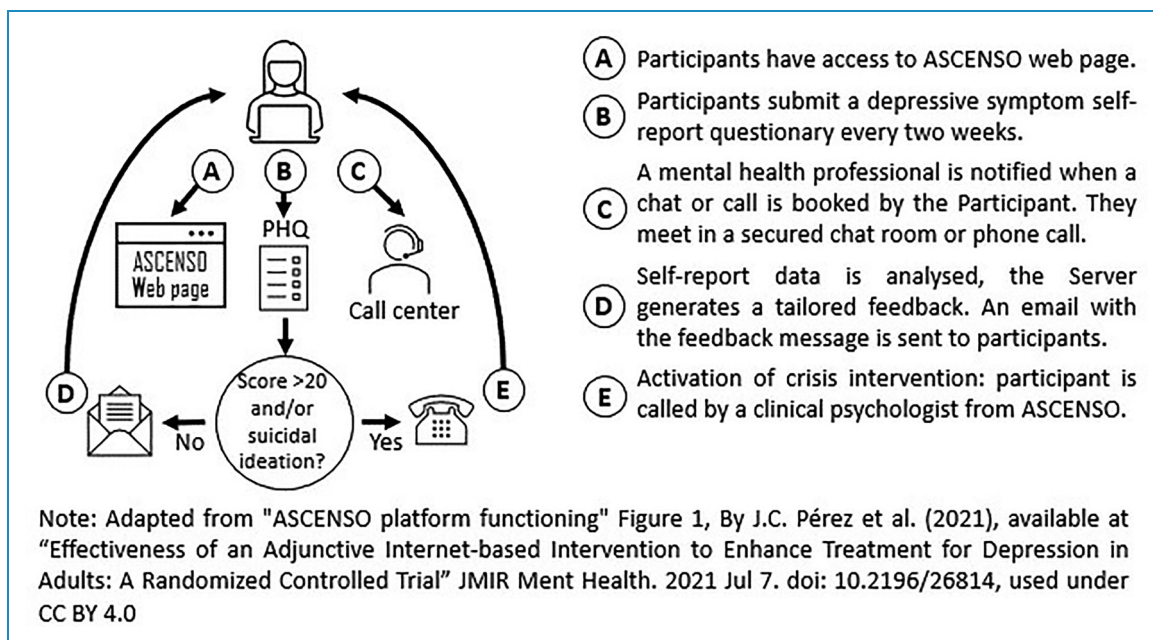
The interviews were conducted by a female research assistant (doctoral student, who had experience in conducting semi-structured qualitative interviews), unconnected with the program implementation. They were audio-recorded and transcribed. The interviews were held mostly in person, and five over the telephone or online given the restrictions imposed on the management of the COVID-19 pandemic. In-person interviews were done in the mental healthcare center. No other person was present during the interviews. Interviews lasted an average of 45 min. Transcripts were not returned to the participants for comment, and they were not provided feedback on the findings.

### *Data analysis*

A data-driven thematic analysis<sup>31</sup> based on principles of grounded theory (GT)<sup>32,33</sup> was conducted. Three female members of the research team performed the data analysis. Two of them hold a PhD degree, and all of them are clinical psychologists, with previous experience in IBIs’ studies and inductive qualitative analysis. Two of the researchers oversaw the ASCENSO study, and the third researcher was the research assistant who interviewed participants. None of them have a previous relationship with participants. The research was conducted in a Latin American sociocultural context.

The interpretive–constructivist epistemological paradigm guided this analysis, which states that people, based on their own subjectivity, give sense to their experience in interaction with their context.<sup>34</sup> In this way, the meanings presented are co-constructed by the participants and the researchers, implying a transactional and subjectivist epistemology.<sup>35</sup>

Several steps of analysis were completed on a cyclical basis before arriving at the final results.<sup>35,36</sup> First, two researchers read the whole interviews to get an overview of patients’ perceptions and experiences regarding the ASCENSO website (see Preliminary version of categories and subcategories in Appendix 3, Supplementary Material). Then, two separate researchers conducted open coding, segmenting the narratives into units of meaning (concepts) that represented characteristics and dimensions of patients’ perceptions and subjective experiences about the different components of the ASCENSO website. These descriptive concepts were codified by two researchers and then triangulated by a third. Concepts were categorized into two axial codes of more general and specific content regarding the research questions. The concepts used for the construction of the axes were those that reached theoretical saturation. Finally, an interpretative analysis of the central descriptive categories



**Figure 1.** ASCENSO platform functioning.

was carried out,<sup>35,36</sup> which is presented in the following relational scheme.

During the data analysis, the conciliation and triangulation process was constant, and when appropriate, categories were adjusted, or new ones were created to maintain proximity to the discourse of the participants. This was done by checking the codes against the data to ensure that supporting quotations accurately depicted the concepts.

## Results

### *User's perceptions of the program that favor usability*

For the participants, the main advantage of the ASCENSO IBI was filling out the depressive symptoms' questionnaire every 2 weeks. The questionnaire enabled them to observe and monitor their symptoms and reflect on the changes experienced, both for patients with high and low response rates. For example:

[They were a chance] to think, to analyze in more detail what was happening to me... because through that I learned from the questions, 'okay, how do I feel? Why do I feel this way?'... In my daily life I don't feel that one doesn't perceive those things, but when they ask you, [you think] and say 'right, I felt this way for this or that reason today'. (I11, pp. 40–44)

It offered the opportunity to monitor their emotional states, which normally went unnoticed in their everyday

lives. Resulting in subsequent reflections that were sometimes integrated into their in-person therapy sessions:

I also took advantage of this in my psychologist sessions, I'd say to him, 'you know, in the survey I took, I'm staying at this point, so we took those things as topics to work on, mostly because I saw I couldn't get out of that specific state'. (I7, p. 104)

Regarding the formal aspects of the monitoring system, most participants highlighted its format and considered its easy access among its most positive features. They noted that the link received via email allowed them to directly and easily access and answer the monitoring system, without a password and from any device (personal computers or mobile devices). With a few short questions focused on depression.

Despite being this tool the most widely used, some difficulties are highlighted. In fact, some users found the questionnaire and feedback messages to be discouraging, because they were perceived as excessively simple, generic, and repetitive. Furthermore, users felt that the results yielded by the monitoring system and the feedback generated didn't reflect their subjective state or perceived changes; there was a disconnection between personal experiences and what the ASCENSO IBI indicated. In this regard, one participant remarks: "It was the same score, but I felt different, so I felt that maybe I needed a more detailed scale to evaluate that" (I2, p. 34). Finally, they considered the system limited space for more detailed answers or to elaborate on their personal experiences.

Receiving phone calls from clinical psychologists, which were generated by ASCENSO's IBI when suicidal

**Table 2.** Domains, categories, and subcategories.

<b>User's perceptions of the program that favor usability</b>
Proactive attitude of the program
<ul style="list-style-type: none"> <li>Creates a self-monitoring/self-observation space</li> </ul>
<ul style="list-style-type: none"> <li>It sends me the invitation directly to my email without access password complexities (it reaches to me directly)</li> </ul>
<ul style="list-style-type: none"> <li>It sends results and suggestions to my email depending on my answers</li> </ul>
Activities are centered on me (useful for me)
<ul style="list-style-type: none"> <li>Keeps me informed of my changes/evolution</li> </ul>
<ul style="list-style-type: none"> <li>It gives me tips and activities that I like according to my answers</li> </ul>
It detects and validates my emotional states and reacts accordingly
<ul style="list-style-type: none"> <li>Response to negative emotional state and assistance call are suitable</li> </ul>
<ul style="list-style-type: none"> <li>Videos and psychoeducational material about depression reflects/validates thoughts and/or feelings experienced</li> </ul>
Assistance call
<ul style="list-style-type: none"> <li>Caller was a well-trained professional</li> </ul>
<ul style="list-style-type: none"> <li>Close and concerned/supportive attitude of the caller</li> </ul>
<ul style="list-style-type: none"> <li>I felt seen (that the team was mindful of you)</li> </ul>
<ul style="list-style-type: none"> <li>I was contained/supported</li> </ul>
<ul style="list-style-type: none"> <li>To remember the possibility of asking for a session with a psychologist or doctor</li> </ul>
Recruitment process as caring and supportive experience
<b>User's perceptions of the program that hinder usability</b>
"Artificial intelligence"
<ul style="list-style-type: none"> <li>Questionnaire feedback is highly standardized, simple, and repeated and does not reflect my actual state</li> </ul>
<ul style="list-style-type: none"> <li>It does not perceive my changes</li> </ul>
<ul style="list-style-type: none"> <li>Website does not change content</li> </ul>
Does not recognize individuality of each participant
<ul style="list-style-type: none"> <li>Answers are not suitable to emotional state</li> </ul>

- Generic and obvious information without considering mood and cognitive characteristics

#### Activities not used

- Users did not remember the password or that the website existed

- Chat is impersonal

- Difficult-to-answer questionnaire due to daily life duties

#### Activities are focused on the research usefulness

- Lack of or little information about the duration or end of the questionnaire and support program

- They only extract data from me

- It doesn't work for me

risk was identified by the monitoring system ("the alarm system"), was very positively evaluated by the users who received them. The participants found them highly pertinent to their emotional state at the time, making them feel that "someone" was paying attention to their distress and was accompanying them. They experienced the call as a sign of "genuine" concern. The interlocutor was perceived as a well-trained professional who handled the emotional aspects of their situation aptly and was able to offer assistance options that they were unable to visualize at the time. In this regard, an interviewee noted:

I really liked it when I was feeling awful, it was great to get a phone call, because I didn't know who was calling, but it was clearly a psychologist, because of how this person handled the topic, it wasn't an imposing attitude or someone who said 'well, that sucks, okay, calm down now,' no, they were like, 'oh, what happened?, how have you've been feeling lately? Remember you have this available'. (I5, p. 16)

Finally, the recruitment process for the trial study was spontaneously mentioned during the interviews; it was remembered and evaluated positively. These 45-min-long interviews were conducted face to face by clinical psychologists and explored biographical and clinical aspects, in order to account for the inclusion and exclusion criteria. From the perspective of the interviewees, this space was viewed as a source of care and support. Many users thought these interviewers were "behind" the ASCENSO IBI. This point is made by one user (Table 2):

I joined this program because I had an hour-plus, in-person interview with someone from the intervention team ... actually, you came out of it feeling great, you were like, ‘hey, cool, this is going to be quite useful’. (I12, p. 26)

### *User’s perceptions of the program that hinder usability*

The ASCENSO website was not extensively used by the participants; many of them did not remember it unless prompted. The patients stated that it was unattractive, with very simple contents, and difficult to access. In this regard, a patient points out:

I found the website lacking, it had very little content, I mean, I checked it out one day and I saw the whole thing... and because I had read everything and saw no new content, I never looked at it again. (I2, p. 116)

Despite their low use, the elements of the website that were most valued were the videos and the psychoeducational material on depression, which helped users gain a clearer understanding of the disease and recovery and provided advice to improve their quality of life:

The videos were super clear and somehow encouraged me to leave the disease behind, because they were there to help you understand the disease and give you hope that everything could get better, they were oriented toward recovery and showed you that even though the disease is difficult, you can eventually overcome it. (I8, p. 40)

The option to have an online or phone consultation with a psychologist was minimally used. Many of the interviewees were not aware that these options were available. Other participants considered that the chat room was uncomfortable to use and impersonal, making them feel like an “artificial intelligence” was answering their questions. Furthermore, some interviewees were unsure about sharing their private information through this channel. In addition, they viewed this option as unnecessary, since they were able to contact their treating psychologist (because this IBI was implemented adjunct to face-to-face treatment):

I think it’s kind of weird (...) it was very impersonal, someone who wants to help you needs to understand a little of what’s beneath the surface... but that person doesn’t know [your history]. So, I guess you’d have to explain them all your history, and expect them to understand... And only then, would they be able to advise you. (I1, p. 195)

Finally, the ending of the intervention was experienced in an uncomfortable way. The users’ emotional reaction was frustration when the support period of ASCENSO ended. They expected a more personalized closing stage and ideally a gradual announcement. Since the closing stage of the program lacked these features, it was regarded as abrupt and careless. One user portrays this situation as follows:

It was like, everything was going well, and suddenly they tell you ‘this is the last survey,’ and you’re like, ‘well, okay,’ and then you get an email like 3 months later, so, I feel it should have been more... (laughs), like, they should have warned you... [okay]... but not shutting everything down all of a sudden and then call you [to schedule this interview] to say ‘let’s get together,’ I don’t know, it’s kind of weird. (I1, pp. 223–225)

### *Relational scheme: “searching for a humanized IBI”*

Based on the experiences described by the participants, a relational model was constructed. The core phenomenon was labeled “the search for a humanized IBI.” This model offers an understanding-oriented explanation of the use/non-use of the ASCENSO IBI (see Figure 2).

Users’ experience with ASCENSO began with the recruitment process, which led participants to believe that the recruiters – clinical psychologists who conduct an in-person, in-depth interview with users – were part of the team “behind” the IBI. They extrapolated to the ASCENSO IBI the relationship established with the recruiter, giving a “human face” to ASCENSO intervention. In this context, they developed expectations regarding the type of relationship that they would establish with the digital program, such as being cared for and supported by it, which encouraged them to join it. During their interactions with the components of the ASCENSO IBI, users experienced various levels of satisfaction – or frustration – concerning the “program relationship” expectations.

When participants considered the program to be proactive (for example, “IBI came to them,” through emails with direct links to the monitoring system), and when feedback messages were aligned with or matched their feelings. In these cases, their expectations of human and personalized contact were met, because they perceived “a real interest” and sensitivity of the IBI toward them. This appears to have made users feel individualized and not merely part of a database. This feeling can be illustrated by a user as follows:

I think it was good, it’s a way of demonstrating that people do matter, that the follow-up they do is real, that the alert signals are important, and that, in fact, especially in times like these... this is when the service needs to be available, across all devices... there can’t be a void, because you’re given all these choices. (I2, pp. 88–90)

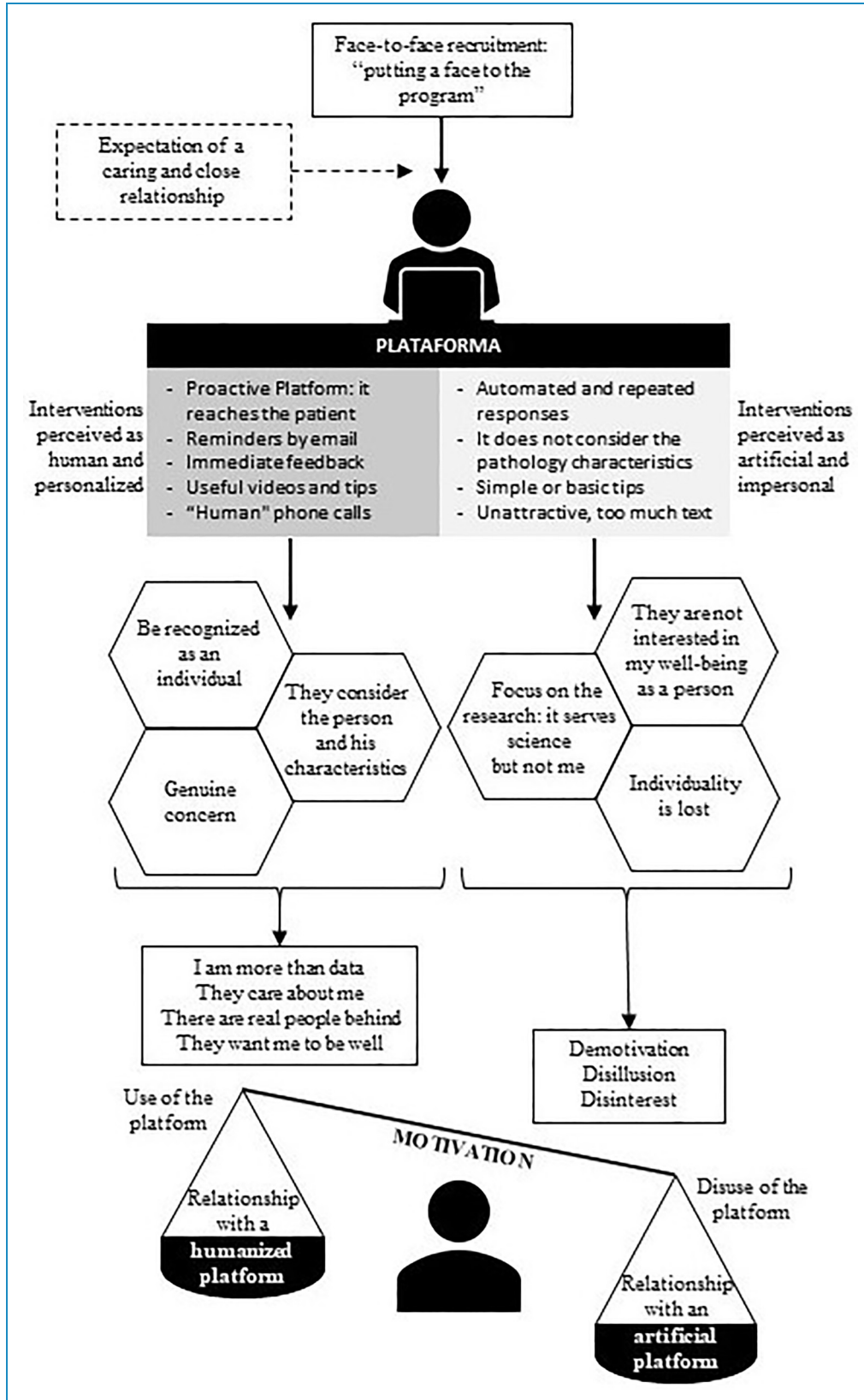


Figure 2. Relational model.



In contrast, when users felt that the ASCESO IBI did not take into account their particular characteristics and specific needs, their expectations of engaging in warm and sensitive human contact were frustrated. They perceived the interaction as cold, distant, insensitive to their emotional state, and targeting a generic, unspecific audience. This generated a feeling of being “used” and frustration, discouraging the IBI use. In this regard, one patient notes:

[the IBI must be] more focused on the feelings of the person who’s reading it or doing activities. But then you access the website and you receive these [monitoring questionnaires] and you’re like, ‘wow, what are they thinking? They’re just looking for information for their research,’ it’s like they benefit and you’re like doing a job, that was the feeling I got sometimes. (I12, p. 26)

Lastly, the user’s perceptions of a “humanized relationship” vs. an “artificial relationship” were component-specific and fluctuated in each user. Thus, over the course of their interaction with the IBI, the balance may be “tipped” to one of them, depending on the degree of match between their perceived personal needs and what the IBI can satisfy.

## Discussion

This study explored the subjective experience of IBI ASCESO users, with the aim of developing an understanding-oriented model of its low usage rate.

Elements perceived as beneficial by participants, and that, therefore, encouraged IBI use were those in which the user’s emotional state was assessed (monitoring system), and the received phone calls. The monitoring system was evaluated as “easy to use,” and they felt that it created a “moment” in their everyday life when users could reflect on their bodily and psychological states and changes. The generation of awareness through monitoring systems has been previously reported, considering both web-based interventions (with<sup>25</sup> and without human support<sup>22</sup>) and web-based blended interventions.<sup>37</sup> Also, psychotherapists have reported that mood ratings encourage patients to reflect instead of accepting a black-or-white way of thinking, a typical cognitive bias in depressive patients.<sup>37</sup> In the present study, through the fact that was a blended care intervention, the therapeutic effect of this “moment” is especially relevant since patients’ reflections on their symptomatology and disease evolution – which emerged within the context of the use of the IBI – could be discussed with the therapists in their face-to-face sessions.<sup>38</sup>

Furthermore, when the program exhibited a proactive attitude in its interaction with users, establishing personalized communication sensitive to their needs or psychological states, users were encouraged to access and use it. Based on this quality of “humanization,” patients feel

acknowledged by the “IBI-other” as an individual person and not as a generic user. In contrast, experiencing mismatch between the patient’s needs and states and the elements offered by the system discouraged use and accentuated the feeling that they were in contact with an automatized system.

These results are consistent with other studies on users’ subjective experience of not blended IBIs, which reveal a need for a more personal support,<sup>15,20–24,39</sup> independently of the intensity of the support provided.<sup>25</sup> In fact, Mohr et al. developed guidelines for the operation of human support in IBIs, establishing that human support increases adherence through accountability to a coach who is seen as trustworthy and has expertise.<sup>40</sup>

Personalization is an important feature of programs in the existing literature. Johansson et al.’s<sup>23</sup> theoretical model on IBI adherence proposes that the mismatch between participants’ perception of the treatment and their actual situation is the underlying reason for non-adherence, to both blended care a non-blended care intervention. Similarly, Donkin and Glozier<sup>21</sup> assert that one of the main barriers preventing adherence to IBIs is the perceived mismatch between what the program gives patients and their true state or necessities, echoing the idea that a lack of personalization makes it difficult for subjects to use an IBI consistently.

It is interesting to reflect on the users’ notion that “behind” the computer “there is a person with whom a relationship is established,” in the line of emulating an “other real human” who can see and think about him or her. It is as if the user wished that the digital program was able to mentalize him.<sup>41</sup> Consistent with the above, since there is a “human other behind the IBI,” it is reasonable to propose that a therapeutic alliance could be established “with him/her,” which would favor adherence to mental health interventions, both face to face and digital, and would be a factor that promotes change.<sup>42,43</sup> In fact, Doukani et al. (2020) proposed that higher levels of accessibility, immediacy, ease of use, opportunities for self-directed treatment, and even aesthetic appeal are usability heuristics to promote active engagement with digital interventions.<sup>42</sup>

In addition, it is relevant to understand the usage of IBIs in light of the depressive experience, which is not homogeneous. Following Blatt and Luyten’s<sup>44–46</sup> model that distinguishes the anaclitic and introjective subtypes of depression, which are configured in the dialectic interplay between two psychological dimensions of personality: interpersonal relatedness and self-definition. It could be reasonable to propose that the type of depressive experience could shape the necessities and expectations of the user regarding the characteristics of the program. This is consistent with the literature that indicates that these depression subtypes differ in their response to treatment,<sup>47</sup> requiring a specific therapeutic approach.<sup>48–52</sup> Extrapolating this finding to the use of IBIs, it could be hypothesized that the anaclitic depressive configuration – in

which there is an increased need to establish and maintain close interpersonal relationships – might be especially sensitive to the perception of a more humanized interaction with the virtual system, discouraging IBI use when these needs are thwarted by IBIs that do not enable users to experience human support. On the other hand, subjects with introjective depressive configurations,<sup>44</sup> who exhibit a need for autonomy and control over their body and mind, might be more prone to use IBIs due to feeling that they are less intrusive and threatening than other intervention methods.

In the ASCENSO program, the participants' experience during the face-to-face research recruitment process helped generate high expectations of human support in this IBI. Although this increased motivation to participate, some patients felt discouraged, since their expectations exceeded what the program offered. This phenomenon could be considered as a specific ethical issue when blended IBI studies are implemented. In this line, future implementations of blended IBIs need to clearly explain which elements are automatized and which aren't, since this has an impact on users' trust and alliance with the program. In fact, the absence of such information can cause some users to feel confused or manipulated. Other studies carried out in non-blended interventions have also reported that participants find it difficult to differentiate research-related elements from those belonging to the intervention program as such<sup>21,22,25</sup>; for instance, they may – as in our study – identify recruiters as part of the program or follow-up questionnaires as part of the treatment.

Finally, our findings highlight the challenges associated with the development of algorithms capable of attracting users. These should be designed to generate a virtual relationship that emulates a human one and targets the characteristics of each user: symptom specificities, the phenomenology of their health condition, language use, behaviors, emotional states, and perceived needs. Users' clinical profile is essential in the definition of the elements to be included in the implementation of IBIs (both in blended and non-blended interventions), in addition to sociocultural characteristics, educational level, and technology competence.<sup>53</sup>

Our findings need to be considered in light of some limitations, one being the gap of time between participants finishing the intervention and when the interview took place (some even 25 months apart) which might affect the capacity of recalling certain aspects of the intervention. Also, even though participants with positive and negative experiences were included, those who employed the ASCENSO IBI more systematically predominate in the sample. Moreover, ASCENSO's RCT participants have a high level of education and low comorbidities, and most of them are not "digital natives"<sup>54</sup> (they were born before 1995), which may limit the generalization of our findings. Age is a relevant element since digital natives tend to interact through digital formats on a daily basis and do not

register differences between offline and online modalities.<sup>54</sup> Finally, since the interview was voluntary, it might not reflect the experience of those that chose not to participate in it.

Despite these limitations, our findings allow for the development of the proposed model of (dis)use of IBIs which establishes elements to be considered in the design and implementation of these types of interventions to promote their use and effectiveness. Although our results were obtained when program users utilized a web-based blended intervention, our main results could be applicable to non-blended interventions as well, given the consistency between our findings and those from studies carried out in web-based non-blended interventions (with and without human support). However, future research may help clarify this trade-off.

## Conclusions

In the context of the growing number of blended interventions to treat several mental health problems,<sup>55</sup> our findings support a model of (dis)use of blended IBIs which establishes core elements to be contemplated in their design and implementation phase to promote their use and effectiveness. These highlight the importance of user-centered design in digital mental health interventions. Addressing users' expectations for humanized interactions, personalization, and sensitivity to their emotional states can enhance usability and engagement with such programs.

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