Universal Access in the Information Society
https://doi.org/10.1007/s10209-023-01038-2

SHORT PAPER

Needs analysis for the design of a digital platform to train professionals in online family intervention through live supervision of real cases

Sonia Torras[1] · **Anna Vilaregut**[1] · **Xavier Canaleta**[2] · **Eduard Martí**[1,2]

Accepted: 25 July 2023

Abstract

Purpose Mental health professionals undergo continuous training throughout their careers. Their training consists in part of the supervision of cases by an entire healthcare team, a practice that allows them to consolidate their understanding of behaviour, emotions and to enhance their relationships with patients and their families. The COVID-19 pandemic has had a great impact on this training methodology, leading to a significant increase in the use of digital platforms, but such digital tools are not well adapted to this context, especially when it comes to the supervision of real online cases. The goals of this study are: (1) to analyse what professionals need in order to carry out online interventions and training through the live supervision of real online cases and (2) to create a prototype of a specific digital platform intended to help meet the detected needs.
Methods 28 semi-structured interviews were conducted with supervisors ($N=14$) and professionals in training ($N=14$).
Results The results have allowed us to gain a deeper understanding of the difficulties and benefits that professionals are encountering when doing online live supervision using the existing video conference platforms.
Conclusion This analysis points to a need to create a platform that can overcome the difficulties and enhance the benefits of the digitalization of family intervention training through the live supervision of real cases. These specific needs have yet to be addressed by existing digital platforms.

Keywords Virtual learning environment · Family intervention · Live supervision · Mental health · Training processes · Online learning

1 Introduction

The COVID-19 pandemic has had a great impact on healthcare, especially on mental health [1, 2]. The pandemic and the accompanying restrictions on mobility and social distancing have combined to generate a significant increase in the demand for psychological care. This care has often been offered through online intervention using videoconference tools that are not adapted to this context. Nonetheless, COVID-19 has accelerated a process of change and digital transformation that was already underway in healthcare. This process calls for a deep reflection on how to optimise psychological and socio-health care. The pandemic has been a turning point in the implementation of information technology in these areas.

In the light of these developments, the Spanish Federation of Health Technology Companies [3] described the scenario resulting from the pandemic as an opportunity to consolidate structural changes and move towards further digitalization. The Next Generation EU post-pandemic recovery plan, meanwhile, advocates advancing towards a more modern and sustainable Europe. The Recovery, Transformation and Resilience Plan launched by the Spanish government [4] is committed to digital, green and inclusive growth and to the promotion of artificial

✉ Sonia Torras
soniatg@blanquerna.url.edu

Anna Vilaregut
annavp@blanquerna.url.edu

Xavier Canaleta
xavier.canaleta@salle.url.edu

Eduard Martí
eduardmartivaquer@gmail.com

[1] Ciències de l'Educació i de l'Esport Blanquerna, Facultat de Psicologia, Ramon Llull University, Barcelona, Spain

[2] La Salle, Ramon Llull University, Barcelona, Spain

Published online: 20 October 2023

intelligence. Finally, the Spanish Strategy for Science, Technology and Innovation (2021–2027) [5], in the context of the Horizon Europe EU science and innovation framework programme (2021–2027), also places special emphasis on health and the digital world.

Given this trend, the Spanish Health Ministry has highlighted the need to update digital tools so that they are better able to meet current public health challenges. To this end, the official Spanish Mental Health Strategy 2022–2026 [6] has been updated to set out the conditions for improving mental healthcare in the National Health System through measures based on equity and sustainability. Among the key points of this Strategy is its cross-cutting approach aimed at improving the capacities of health workers and increasing the levels of coordination between resources and levels of care, as well as between family care and intervention, all with an eye towards the UN's Sustainable Development Goals for 2030 (specifically, the goals pertaining to health, welfare and education) [7].

In March 2020, UNESCO launched the Global Coalition for COVID-19 Education, an initiative whose aim is to protect people's wellbeing and ensure their access to continuous learning. It takes the form of a multi-stakeholder alliance between the United Nations system, civil society organisations, the media and IT partners, all of whom are working to design and implement innovative solutions. The Global Education Coalition strives to help countries mobilize their resources to implement innovative and context-appropriate solutions to provide distance education.

There has also been a notable increase in the prevalence of mental disorders in the Spanish population [6, 8]. The growth of these disorders has been even greater in the last few years as a result of the COVID-19 pandemic [9–11], and this has had a definite impact on family relationships [12–14].

Meanwhile, it has been shown that interventions aimed at improving the state of family relationships can generate direct effects in terms of the reduction of psychopathological indicators. For this reason, family interventions are considered a basic element of the mental health strategy (Mental Health Strategies of the National Health System [15]; Comprehensive Care Plan for people with mental disorders and addictions [8]).

To guarantee the effectiveness of interventions, professionals must be provided with the resources that they need to treat people and their families with the aim of improving their quality of life. Among these needs is training, as mental health professionals continue to educate themselves in their fields throughout their careers. As part of this professional training, their cases are supervised, and they carry out clinical sessions with the entire care team in order to consolidate their understanding of behaviour and emotions and to improve relationships with patients and their families [16].

Specialists in family intervention are required to undergo direct observation and supervision as part of their training. It has been proven that this methodology is very effective, both for the training of family intervention professionals and for the families themselves [17]. Professionals receiving training in family intervention work simultaneously on theoretical and practical content. During their initial training, they observe real cases live from behind a one-way mirror, while supervisors comment on the interventions and connect them with the theoretical models they have worked on. Subsequently, the same professionals in training begin to work on their own cases while receiving live supervision.

Live supervision was first described by Montalvo [18] as the process by which the supervisor guides the trainee through a clinical intervention. Supervisors use a one-way mirror, camera, or audio system to observe and communicate during live sessions. This allows the supervisor to have a direct view of the intervention and thus to provide immediate advice to the professional in session. Bartle and Haring [17] state that in this format both the patients and the trainee benefit from live supervision.

In live supervision, the supervisor and the trainees are part of the same intervention team [19]. The mirror represents the presence of the team within the session (observation room), and the professional who is in session (session room) is the spokesperson and representative of the team. Haley [20] and Ceberio [21] emphasise that it is important for the supervisor to address the professional who is in session, taking into account the skills and resources known to him. From the point of view of the patients and/or family, this supervision process is just another element of the intervention, and they often appreciate the fact that a whole team in the room and behind the mirror will be helping them [22].

According to Champe and Kleist [23], there are different types of face-to-face live supervision. One of them is called "Bug-in-the-eye". This consists of the supervisor providing his or her ideas through a visual screen inside the office. Another is "Bug-in-the-ear", which consists of the supervisor providing his or her ideas through a headset [24]. Another form of supervision occurs through the use of a telephone. In order to do this, telephones are installed in each room so that the supervisor can call the professional who is leading the session. The supervisor can also enter the session in order to communicate directly with patients, to make a more complex suggestion or comment, or to otherwise respond to the circumstances [25]. The professional who is in session can also leave to consult with the team as many times as they wish, as long as these interruptions are not excessive. According to Ceberio [21], there is a risk of losing the continuity of the session due to successive absences that, even if they only last a few minutes, can break up the atmosphere of the consultation. Another modality of live supervision is Knock on the door. In this methodology, the

supervisor can knock on the door of the room where the session is taking place and the professional inside leaves for a few minutes to receive a suggestion or comment from the supervisor [26].

It has been observed that professionals who receive live supervision tend to acquire skills to work with patients more quickly [27]. Moorhouse and Carr [28] describe live supervision as a support tool and a source of advice on how to proceed at critical moments during the intervention.

The COVID-19 pandemic had a great deal of impact on this training methodology, generating a significant increase in the use of digital platforms that are not well adapted to this context, especially when it comes to supervision of real cases online.

During the pandemic, Nadan et al. [29] trained professionals in family intervention through live supervision using the Zoom platform. The group of observers muted their microphones and deactivated their cameras on the platform, allowing them to watch and listen to the session without being seen and heard by the family and session professionals. The supervisors contacted the professionals in session through WhatsApp text messages or phone calls. In addition, supervisors were able to enter the session room at any time by activating their microphones and cameras, thus becoming visible to everyone (family, therapists, and observers). Observers were able to communicate their thoughts or suggestions through private messages to supervisors and other observers. Even so, the trainees pointed to the difficulty of having to be attentive to the intervention and at the same time to the messages that were sent by the WhatsApp group of observers. On the other hand, the supervised professionals rated the guidance messages sent by the supervisor throughout the session as very beneficial and found it to be less intrusive than telephone calls.

In Sahebi's study [30], the supervisor and observers were available via video call to provide live private text messages to the practitioner in session. They also reserved virtual meeting rooms in case the professional needed to leave the session room to consult with the supervisor and observers. In another study [31], they explain that during the pandemic the professional trainers were unable to carry out direct online supervision and instead viewed session recordings.

The studies by Nadan et al. [29] and Sahebi [30] concluded that supervisors, trainees and families felt comfortable with live online supervision and considered it a very positive experience. Specifically, professionals in training said that it had been beneficial for their learning and enabled them to better help families. Echoing other studies on direct online supervision, these researchers found this modality to be highly beneficial in that it offers opportunities to work with supervisors from different geographical locations, to be exposed to greater diversity of intervention models and experiences, and to learn from different cultures [29–33]. They considered this modality of work to be a good alternative for families, supervisors and trainees who wish to carry out training and have difficulties in attending in person due to geographical limitations or other work and/or personal reasons.

Sahebi [30] and Springer et al. [34] point out the difficulties of online connectivity and the lack of training in the use of technology to carry out interventions and direct online supervision. Schmittel et al. [31] and Mosley et al. [33] also pointed out that the virtual context requires good management of ethical behaviour and steps to ensure the confidentiality of trainees and clinical material.

Nadan et al. and Sahebi [29, 30] pointed out as a limitation that they felt more distant from the group atmosphere and dynamics than in direct face-to-face supervision, since during the intervention the supervisor could not communicate either with the professional within the session or with observers in a fluid way. Therefore, they suggested further research to verify the effectiveness of these new modalities.

In this context, the goals of this study are: (1) to analyse the needs identified by mental health professionals when carrying out online intervention and training through the live supervision of real cases using existing digital tools. And (2) to create a prototype of a specific digital platform to respond to the detected needs.

2 Method

2.1 Design

For the purpose of this study, a qualitative research design was selected, specifically consisting of the analysis of individual interviews. It was considered an adequate method for this study, since the main goal is not to measure, but rather to gain a deeper understanding of online family intervention training through live supervision of real cases [35]. This design requires a detailed collection and analysis of the experiences, perceptions and attitudes of the participants. This type of qualitative design is used very frequently in the field of psychology by researchers wishing to deepen their understanding of different phenomena [36]. To ensure the quality of the analysis of the research interviews, the guidance provided by Breen [37] and Morgan [38] was followed.

2.2 Participants

The sample was made up of expert supervisors in family intervention and family intervention professionals in training. A non-probabilistic sample was used, with potential participants recruited from different universities and training centres: Ramon Llull University (URL), Open University of Catalonia (UOC), International University of

Catalonia (UIC), University Institute of Mental Health Vidal i Barraquer, Systemic Institute of Barcelona (ISBA), Eduvic- Escola Itinare, Spanish Federation of Psychotherapy (FEAP), Catalan Family Intervention Society (SCTF), Official College of Psychology (COPC), Hospital Universitari d'Igualada, Health Consortium de la Anoia, Brief Therapy Center of Palo Alto (USA), and the European and the Latin American Network of Systemic Schools (RELATES).

The inclusion criteria for expert supervisors in family intervention specified that each of these participants must: (a) be a supervisor linked to a university psychology department or a training centre in family intervention, (b) be a native Spanish speaker, (c) participate voluntarily and offer an informed consent. For the trainees in family intervention, the inclusion criteria called for participate to: (a) be actively training in family intervention, (b) be native Spanish speakers, and (c) participate voluntarily and offer informed consent.

In total, 28 semi-structured interviews were conducted, 14 of them with expert supervisors in family intervention and 14 with professionals undergoing training in family intervention. In Spain, 13 interviews were conducted with supervisors and 9 with trainees. In Colombia and Palo Alto, 2 interviews were conducted with supervisors. In Peru, Chile and Mexico, 5 interviews were conducted with trainees. An overview of participant demographics is provided in Table 1.

For the group of supervisors, 14 leading professionals in the field of family intervention were intentionally selected. Among them were the president of the European and Latin American Network of Systemic Schools (RELATES) and members of the Spanish Federation of Psychotherapy (FEAP), the Catalan Society for Family Intervention (SCTF) and the Official College of Psychology (COP). The supervisors were graduates in psychology ($n=12$) or psychiatry ($n=2$) and had between 2 and 30 years of experience supervising cases in person. All supervisor participants began to conduct live online supervision for the first time during the pandemic.

Meanwhile, the professionals undergoing training in family intervention, at the time of the interview, were completing an official master's degree in family intervention. All of them had participated in at least one face-to-face live supervision session. The professionals in training also underwent direct online supervision for the first time during the pandemic.

Supervisors and trainees who began live supervision online during the pandemic used the video conferencing platforms Google Meet and Zoom.

Table 1 Descriptive data on participants

	Total	*N* Women	*N* Men	Age range	Years of experience in supervision
Supervisors	14	11	3	28–65	2–30
Trainees	14	12	2	23–40	–

2.3 Procedure

The study was presented to the Ethics Committee of the Ramon Llull University. The purpose of the research was explained to all study participants, who were asked to voluntarily participate and offered their informed consent both online and through audio recordings following Organic Law 3/2018 on the protection of personal data and digital rights.

The participants were recruited through emails to contact people at the universities and training centres mentioned above. These universities and training centres were chosen because they are leading training institutions in the field of family intervention.

Twenty-eight semi-structured interviews were conducted and recorded using the Google Meet application in October and November 2021. The interviews lasted 60 min each. Each semi-structured interview was divided into four thematic areas: (1) online training, (2) online family intervention, (3) the observation of real cases lives online, and (4) the supervision of real cases live online. For each thematic area, questions were asked about benefits, difficulties and proposals for improvement based on their experience. For example, in the thematic area on direct online supervision, the following three questions were asked: (1) What benefits do you think direct online supervision can have? (2) What difficulties do you think might be involved in direct online supervision? (3) What technological specifications should direct online supervision meet?

2.4 Data analysis

Audio recordings of the semi-structured interviews were transcribed verbatim, and once transcribed, the transcripts were entered into ATLAS.ti 8, a qualitative analysis software package, in order to facilitate data coding until category saturation was reached [38–40]. In all the transcriptions, the anonymity of the participants was preserved following the Organic Law 3/2018 on the protection of personal data and digital rights.

The interviews were analysed by two researchers, both members of the research team and experts in family intervention. To ensure a good degree of reliability between the two researchers, the interview recordings were evaluated independently. Reliability was calculated using Cohen's Kappa index, through the assessment of a randomly selected sample of interviews (30% of all interviews). A correlation of 0.86 was obtained.

The qualitative analysis of the interviews was carried out using a thematic content analysis to method in order identify and analyse the benefits, difficulties and proposals for improvement, following the procedure defined by Braun and Clarke [36]. The analysis of the interviews until category saturation was reached was understood according to Morse [40] as the point at which the review of the interviews did not yield any new elements. Morse [40] and Mayan [35] point out that the inclusion of new observation units must continue until the researcher has the necessary elements to say something important and novel about the phenomenon that he or she is studying.

3 Results

Tables 2, 3 and 4 show the data obtained after the analysis of the interviews. The answers have been extracted and categorised in relation to the three questions for each thematic area: the benefits that an online family intervention training platform could provide, the difficulties that can arise in the context of online training, and the specifications that this environment should meet. For each of the categories, the frequencies are shown according to the profile of the participants (supervisors and trainees), along with the total values and a representative quote from each category.

For each category, the frequencies are also specified in relation to the four thematic areas: online training (F), online family intervention (I), direct observation of real cases online (O) and live supervision of real cases online (S).

Table 2 shows that participants indicated that the main benefit of a learning platform for training in online family intervention is that it breaks down geographical barriers ($f=38$). Participants said that this format makes it possible to bring together trainees and supervisors from different parts of the world. This category was the most frequently mentioned by the supervisors, and it was the third most relevant among the trainees. In all, it was mentioned in 23 of the 28 interviews.

> "Online training makes it possible to train with people who are geographically in very distant places (...) because trainees do not always have what they want in the place where they live" Supervisor

This benefit is aligned with the second most prominent among those mentioned by the participants: the diversity of profiles ($f=36$). Participants highlighted that the online format allows them to meet different professionals and supervisors with different perspectives and experiences and from socio-cultural contexts. The group of trainees considered this benefit as the most important ($f=24$), while for supervisors it was in second place ($f=12$).

Another benefit all the participants noted that this type of learning platform could offer is accessibility ($f=29$). They highlighted that the online format gives access to training to anyone from anywhere in the world. This benefit was one of the most often cited by both groups interviewed, supervisors and trainees, with a frequency of 11 and 18, respectively.

The last of the four major benefits highlighted would be work and personal balance ($f=20$). Participants highlighted that in the online format, unlike the face-to-face format, it is easier to reconcile the spaces to work, train and attend to personal life. This aspect was considered more important among the group of trainees (mentioned by 10 of the 14 interviewees) than by supervisors (with 7 mentions in the 14 interviews conducted).

Finally, it is worth noting a fifth benefit that, although it was mentioned somewhat less often than the first four, is also a factor to take into account: sustainability ($f=9$). The participants highlighted both the economic benefit the ecological benefits of avoiding travel and the associated expenses. This factor was highlighted more by supervisors than by trainees:

> "It is an economic benefit (savings in travel and associated expenses, and this also implies an ecological benefit, especially for people who travel by car)" Supervisor

Table 3 shows the difficulties that the participants identified in connection with the use of a learning platform. By far the most significant difficulty ($f=37$), mentioned in 23 of the 28 interviews conducted, was group interaction. Participants pointed out that face-to-face meetings generate better communication between people and a richer debate. Supervisors also commented that in direct online supervision they missed some of the interaction they would have had while they were conducting live supervision in person:

> "I was too much in the session and little with the team of trainees, except for the pre-session and post-session spaces, but during the session I wasn't". Supervisor

The trainees also indicated that they had a more passive role from the observation room in which they could not interact with each other:

> "I had a much more passive role. I had a screen without a camera. There was no communication between us and we did not understand some interventions". Trainee

Some trainees ($n=6$) also explained that during the live observation and supervision they had sent WhatsApp messages in order to communicate. They highlighted that it was difficult to pay attention to the session and at the same time read the messages sent by the observation team:

Table 2 Analysis of benefits perceived by the participants

Category	Supervisors						Trainees						Total		Direct quotes
	F(*f*)	*I*(*f*)	*O* (*f*)	*S*(*f*)	*f*	*n*	*F*(*f*)	*I*(*f*)	*O*(*f*)	*S*(*f*)	*f*	*n*	*f*	*n*	
Agility	2				2	2	2				2	2	4	4	“The transmission of information and material is more agile” Supervisor
Accessibility	4		3	4	**11**	**7**	5	6	3	4	**18**	**10**	**29**	**17**	"Having the privilege of having access to this training (…) opens up many possibilities" Trainee
Geographical barriers	6	7	4	6	**23**	**12**	3	5	1	6	**15**	**11**	**38**	**23**	“Online training makes it possible to train with people who are geographically in very distant places (…) because trainees do not always have what they want in the place where they live” Supervisor
Diversity of profiles	4		4	4	**12**	**6**	6		8	10	**24**	**13**	**36**	**19**	“The possibility of connecting with professionals from many parts of the world and sharing knowledge and experiences makes it possible to overcome cultural barriers or highlight cultural differences” Supervisor
Work and personal balance	6	1			**7**	**7**	5	3	2	3	**13**	**10**	**20**	**17**	“being able to reconcile both personal life and work, and being able to continue training” Trainee
Sustainability	3	1	2		**6**	**4**	2			1	3	2	**9**	**6**	"It is an economic benefit (savings in travel and associated expenses, and this also implies an ecological benefit, especially for people who travel by car)" Supervisor
Multiformat resources	2				2	2	2				2	2	4	4	"The multidimensionality that technology allows" Supervisor
Case follow up		1			1	1					0		1	1	“Easily track cases and trainees” Supervisor
Amplified observation			3		3	3			1		1	1	4	4	"A clearer sight. Sometimes with the mirror the non-verbal expression is not always observed with such finesse or if someone is crying" Supervisor
Confortability			2		2	2	1		1	1	3	3	5	5	"being at home and observing and then at the same time being able to think, write, take notes" Supervisor
Contact with the family environment			1		1	1		4			4	4	5	5	“the advantage is that you see them in their own context, at home, it gives a lot of information about some things from everyday life and space, which can be used in therapy” Supervisor
Number of people			1						1		1	1	2	2	“There can be a hundred people in the observation room and in a Gesell chamber there will always be a much lower limit”. Trainee

Highest scores obtained from participants

Online training (*F*), Online family intervention (*I*), Direct observation of real cases online (*O*), Live supervision of real cases online (*S*), Frequency (*f*) and number of participants (*n*)

Table 3 Analysis of the difficulties perceived by the participants

Category	Supervisors						Trainees						Total		Direct quotes
	F(*f*)	*I*(*f*)	*O*(*f*)	*S*(*f*)	*f*	*n*	*F*(*f*)	*I*(*f*)	*O*(*f*)	*S*(*f*)	*f*	*n*	*f*	*n*	
Group interaction	4		1	9	**14**	**11**	5	4	6	8	**23**	**12**	**37**	**23**	"There is a lot less exchange within the group than in the face-to-face format" Supervisor "I was too much in the session and little with the team of trainees, except for the pre-session and post-session spaces, but during the session I wasn't". Supervisor "I had a much more passive role. I had a screen without a camera. There was no communication between us and we did not understand some interventions". Trainee "It was a bit difficult because you are attentive to the computer, but at the same time reading WhatsApp messages, and it was difficult for me to do both" Trainee
Informal spaces of interaction	3		1		4	3	3				3	3	7	6	"You cannot have a coffee with everyone, everything remains to oneself. I think that those moments are also very good to establish connections with referents" Trainee
Handling complex situations	1	7		1	**9**	**8**		10			**10**	**10**	**19**	**18**	"Being online it's more difficult to identify the conflict and work on it, technology gives you the chance to get out easily, to disconnect quickly by turning off the camera and the audio. There is more disengagement when communicating with the other person" Supervisor
Emotional connection	3	4	6	1	**14**	**6**	5	1	1	1	8	6	**22**	**12**	"The most important problem of the screen is to be able to capture and transmit emotions through it". Supervisor
Technological infrastructure	4		1	1	6	5	8	4	5	1	**18**	**12**	**24**	**17**	"having a good Internet connection, having good microphones, a good computer… A few minimums in technological tools and that, perhaps, not everyone can afford" Trainee
Technological skills	3	2		1	6	4	3	1		1	5	5	11	9	"it requires a certain level of handling the screen, the therapist has to be trained" Supervisor
Time difference	1				1	1	2	1	1	2	6	6	7	7	"The time depending on the country where you do it and when there is a time change it is a mess" Supervisor
Maintaining attention	2		1		3	2	3	2	6	1	**12**	**8**	**15**	**10**	"In the end, many of us think that you are not able to concentrate properly when you are at home, you disconnect the camera and keep the session in the background". Trainee
Work environment		2	4		6	5	2	3		1	6	6	12	11	"Another risk for me is also the setting, all the contextualization of setting that is lost" Trainee
Observation of non-verbal information		2			2	2		3	7	2	**12**	**10**	14	12	"you lose a lot of non-verbal information, you don't see the body" Supervisor
Confidentiality			6	1	**7**	**7**		1	1	1	3	2	10	9	"there is a loss of privacy, but they also know that we are professionals who are respecting the code of ethics" Supervisor
Language				4	4	4			1	1	2	2	6	6	"It is important that it is in the same language because I have been trying to do this in China and after two interpreters, even though I am in the session on the computer, the is a lot of lag" Supervisor

Table 3 (continued)

Category	Supervisors						Trainees						Total		Direct quotes
	F(f)	*I(f)*	*O(f)*	*S(f)*	*f*	*n*	*F(f)*	*I(f)*	*O(f)*	*S(f)*	*f*	*n*	*f*	*n*	
Profile diversity				1	1	1	1			3	4	4	5	5	"The cultural difference is also a handicap in the sense that, for example, if the supervisor is not a person who is open to cultural differences or at least understands cultural differences, then he can take for granted that it must be like his usual context because all his years of experience have been in that context" Trainee
Handling silences on the screen				1	1	1		3			3	3	4	4	"Silence on the screen, pauses, are managed poorly. So when I saw a long pause and the therapists did not intervene, it was much easier for me to take the reins of the session". Supervisor
Psychodramatic bodywork								3			3	3	3	3	"Prevents physical interaction, for example, making a family sculpture" Trainee

Highest scores obtained from participants

Online training (*F*), Online family intervention (*I*), Direct observation of real cases online (*O*), Live supervision of real cases online (*S*), Frequency (*f*) and number of participants (*n*)

> "It was a bit difficult because you are attentive to the computer, but at the same time reading WhatsApp messages, and it was difficult for me to do both" Trainee

The technological infrastructure was the second most frequently mentioned difficulty ($f=24$), with a total of 17 of the 28 participants. The participants pointed out that if there are no favourable technological conditions (device with camera and microphone and a good connection) it is hard to conduct a good training session. This difficulty was a concern mostly perceived by the trainees ($f=18$), of whom 12 of 14 mentioned it, while it was cited by only 5 of the 14 supervisors.

The third great difficulty ($f=22$) was the emotional connection, in this case highlighted by both supervisors and trainees. The difficulty of capturing and transmitting emotions through the screen was underscored.

With a lower frequency ($f=19$), though mentioned by 18 of the 28 interviewees (more than the difficulty of emotional connection, which was cited by 12 of the 28), was the problem of handling complex situations. The participants pointed out that when there is a high level of conflict between the participants of the video call, the situation is more difficult to manage online:

> "Being online it's more difficult to identify the conflict and work on it, technology gives you the chance to get out easily, to disconnect quickly by turning off the camera and the audio. There is more disengagement when communicating with the other person" Supervisor

Finally, 8 of the 14 trainees were very clear that one of the difficulties of online training is maintaining attention. Participants described sustaining attention passively looking at the screen as difficult. On the other hand, in the supervisory environment this aspect was not particularly significant, since only 2 of the 14 interviewees mentioned it:

> "In the end, many of us think that you are not able to concentrate properly when you are at home, you disconnect the camera and keep the session in the background". Trainee

Table 4 shows the characteristics that the interviewees consider most important for the learning platform to meet the objectives for which it should be designed and created.

One of the most requested features, mentioned by 23 of the 24 supervisors and trainees, was automatic transcription. The participants pointed out that this would save time and thus allow them to understand in greater depth everything that happens live in the session room and in the observation room:

> "That would be a gift, not only because of the time savings (we all know that transcriptions take up a

Table 4 Analysis of the requested features by the participants

Category	Supervisors						Trainees						Total		Direct quotes
	F(f)	*I(f)*	*O (f)*	*S (f)*	*f*	*n*	*F(f)*	*I(f)*	*O (f)*	*S (f)*	*f*	*n*	*f*	*n*	
Usability	6	2	1	1	**10**	**7**				4	4	4	14	11	"The platform has to be able of not just being easy to learn but that you actually don't have to learn anything" Supervisor
Technological infrastructure	5		5	2	**12**	**6**			3	2	5	5	**17**	**11**	"having the necessary digital tools and that everything works well" Trainee
Accessibility criteria				1	1	1							1	1	"if you were working with a blind patient, then you would need to use some sound, the platform should need to be adapted" Supervisor
Confidentiality			6	1	7	7			6	2	**8**	**7**	**15**	**14**	"The informed consent is important and the commitment of all the observers who are there that it will only be them who will be watching the session, that they will be in a place where other people cannot hear or see what is happening" Trainee
Informal spaces of interaction	3				3	3	2			1	3	3	6	6	"You have to offer an informal space, you can create a lot of connections through all these platforms, even if it is virtual (many platforms have virtual cafeterias)" Supervisor
Logistics and structural organization	2				2	2	2				2	2	4	4	"Online training requires a good structure, the platform is the instrument for the good integration of students and teachers" Supervisor
Equipment display panels	1				1	1			1		1	1	2	2	"that all the students can be seen and above all that the students make themselves seen" Supervisor
Multi-format resources	1				1	1	1				1	1	2	2	"the magic of online training is that it has many tools and many of them are actually used" Supervisor
Automatic transcription				11	**11**	**11**	12				**12**	**12**	**23**	**23**	"That would be a gift, not only because of the time savings (we all know that transcriptions take up a lot of time in therapeutic work) but also so as not to miss any details of the session, in order to understand the sequence of associations, to be able to review later, read, rethink and interpret the session". Supervisor
Simultaneous translation	2		2		4	2	2				2	2	6	4	"the platform should have simultaneous translation, it would give access to millions of people who otherwise can not have access" Supervisor
Recordings		2	5	1	8	8	3	1	2	8	**14**	**9**	**22**	**17**	"If the platform allows you to record it, record both rooms, so as not to lose the opinions of the team" Trainee "It is great that for it to be recorded so that it can be viewed again and commented on. But it should be very clear who can have custody of the recording because it is still clinical material". Supervisor
Waiting room			1	1	2	2							2	2	"A waiting room is also needed for patients. There is a moment when you can say, look, I need to think… you invite people to the waiting room, so as not to take them out" Supervisor
Integrated calendar				1	1	1							1	1	"The issue of the agenda is that it has to be a platform that has its own agenda and its own management system of visits there, that would also be very interesting. With the links of the sessions within the application" Supervisor
Notes				1	1	1	1		3		4	4	5	5	"The truth is that it would be great to be able to take down notes" Trainee

Table 4 (continued)

Category	Supervisors						Trainees						Total		Direct quotes
	F(*f*)	*I*(*f*)	*O* (*f*)	*S* (*f*)	*f*	*n*	*F*(*f*)	*I*(*f*)	*O* (*f*)	*S* (*f*)	*f*	*n*	*f*	*n*	
Double room (one-way mirror)			5	6	**11**	**8**	2		10	4	**16**	**13**	**27**	**21**	"A platform that could reproduce the physical space of the supervision room, which is a room with a one-way mirror where there is a space for the supervision team and a room where the therapist and family are". Supervisor
Phone calls				4	4	4				8	8	8	12	12	"A telephone that allows you to communicate with outsiders (observation room) privately as it is done in face-to-face interventions, even if an image has to appear to simulate it" Trainee
Chat				2	2	2			1	5	6	5	8	7	"It occurred to me that it is also a very good thing to have that supervisor's chat telling the therapeutic team what he is seeing. Then the therapist and the co-therapist can read what the supervisor has been saying about each part of the therapy. Because something that happens to me a lot, now that I am doing therapy with my partner, we would then go back to class and the supervisor gave a couple of opinions of what she had seen, but we didn't not know exactly how each part of the session went. So we could have some feedback from this as well" Trainee
Enter and leave the double room				4	4	4				4	4	4	8	8	"If the supervisor from the observation room wants to say something to the family, they can also enter the session room and if the therapist wants to discuss something with the therapeutic team they can go to the observation room. This would be ideal". Trainee

Highest scores obtained from participants

Online training (*F*), Online family intervention (*I*), Direct observation of real cases online (*O*), Live supervision of real cases online (*S*), Frequency (*f*) and number of participants (*n*)

lot of time in therapeutic work) but also so as not to miss any details of the session, in order to understand the sequence of associations, to be able to review later, read, rethink and interpret the session". Supervisor

The participants also pointed out that the platform should allow recordings ($f = 22$, $n = 17$) in order to be able to review all the content that may be relevant.

Participants also stressed that it should be very clear who can have the recordings and who has custody of them:

"It is great that for it to be recorded so that it can be viewed again and commented on. But it should be very clear who can have custody of the recording because it is still clinical material". Supervisor

The interviewees consider the confidentiality of the data ($f = 15$, $n = 14$) that the platform must provide to be essential. The participants propose that users, before connecting, sign an informed consent and agree to be in a place where other people cannot see or hear what is happening on the screen.

Being able to have a double room (one-way mirror) is another of the essential benefits that the participants point out that the virtual learning environment must have. This requirement was cited by 21 of the 23 participants, in addition to having the highest total frequency of all the benefits collected ($f = 27$):

"A platform that could reproduce the physical space of the supervision room, which is a room with a one-way mirror where there is a space for the supervision team and a room where the therapist and family are". Supervisor

There is a set of benefits such as having equipment visualisation panels, creating a double room, being able to enter and leave the double room, being able to make phone calls or sending messages via chat, which the participants also request. They propose creating a technological infrastructure that allows for more fluid group interaction. For the live observation of real cases, both trainees and supervisors comment that the platform would have to allow for commenting on the cases live while the session is being carried out. For live supervision through the double room, it could have a telephone or a chat function, or it could offer the possibility to directly enter the session room when the supervisor considers it necessary:

"If the supervisor from the observation room wants to say something to the family, they can also enter the session room and if the therapist wants to discuss something with the therapeutic team they can go to the observation room. This would be ideal". Trainee

4 Discussion

The results found have made it possible to collect ideas and learn in greater depth about the benefits, difficulties and ideal specifications that a platform must offer for optimal training in online family intervention. The goals are to enhance the benefits while paying special attention to creating mechanisms to solve the current difficulties of online training in online family intervention through live supervision with real cases or, at least, to reduce their negative impact.

Regarding the benefits, it is clear that online family intervention training helps break down geographical barriers and allows for connections with a greater number and diversity of professionals (supervisors and trainees) [29–34] than the 100% face-to-face format. An online platform that allows direct online supervision of cases would allow the sharing of therapeutic models and experiences, while also shedding light on cultural differences. These differences in profiles and cultures, as the interviewees commented, must be very carefully taken into account in each case so as not to make generalisation errors [30]. It is also worth noting the sustainability of an online platform both at an economic level, saving travel and associated expenses, and at an ecological level due to the decrease in travel. All of this would make it possible to offer a much more accessible and agile training platform to all those who wish to be trained in family intervention while also facilitating a good work-life balance [29, 31, 33].

Carrying out online training and sessions through live supervision allows us to observe everything that is happening on the screen in greater detail and from a comfortable and intimate environment, thus offering the chance for closer observation of the voice and the facial expressions of the participants and, as Mosley et al. [33] have observed, their surroundings. Online sessions offer information on both the physical surroundings of the participants and their general environment [30].

Regarding the difficulties detected in the online training for family intervention, our findings agree with the observations of Nadan [29] and Sahebi [30] regarding more distant group interaction, since with the current video call platforms the observing trainees take a passive role and cannot discuss what is happening throughout the session with the supervisor or among themselves. It is also impossible for the supervisor to communicate with the trainees who are handling the case, and this prevents them from benefiting from the effectiveness of live supervision [17]. That is why the interviewees propose a technological infrastructure that allows for interaction with the group, recreating the one-way mirror used in face-to-face sessions. This, as Rickert and Turner [27] point out,

helps trainees to acquire skills to work with patients more quickly. According to the interviewees, this would consist of recreating a session room where only the family and the trainees who directly intervene in the case would be present, along with another room for the supervision team (observation room) so that the trainees could see the real case live and at the same time discuss it among the group of trainees and with the supervisor. In this way, the group of trainees could be better accompanied in their learning, thus overcoming the difficulties found in the study by Nadan [29] and Sahebi [30], who used a videoconferencing that was not well suited for online training in family intervention.

It should also be noted that, unlike in the study by Nadan [29] and Sahebi [30], the present platform proposal would allow for live supervision through a simulation of a telephone that would be incorporated for the purposes of communication between the session room and the conference room. If the suggestion or comment that the supervisor wants to transmit to the therapist via telephone is more complex, the participants propose that the platform could allow them to directly enter the session and communicate directly with the patients [25]. The participants also suggest that the supervisor could contact the therapeutic space via written "Bug-in-the-eye" messages or "Bug-in-the-ear" audio messages [24], thus giving participants a choice of what type of live supervision they want to carry out [23]. Such a platform could be created at a much lesser cost than all this would have if it had to be installed in a 100% face-to-face environment. The respondents also thought it would be beneficial to have a third room, a waiting room for patients while the team is preparing the session and the return, which would further recreate the face-to-face work environment.

When you work in person, you go to a physical workplace, and this helps you to connect more with what is being done without distractions. When working online, full concentration is more difficult due to the stimulation of the surroundings [32, 33, 41]. As the interviewees observed, this is even more the case if the video camera is not turned on, as they reported that sessions without the camera do not require the same commitment. As a proposal for the platform, the possibility of having the cameras always active would be a solution, in addition to offering a guide, as Springer et al. [34], Mosley et al. [33], and Sahebi [30] suggest, which help trainees and supervisors to prepare to work in an online setting.

Another difficulty, and one that is harder to overcome, is the lesser emotional connection between the participants. As described by Nadan [29] and Sahebi [30], the atmosphere when working online tends to be perceived as more distant. In addition, it should also be noted that non-verbal information can be lost and that it is more difficult to manage silences through the screen. It is also more complex to perform body techniques. Along the same lines, it is more difficult to manage and contain complex situations such as unexpected, aggressive or distant attitudes from patients [30, 33]. For the development of the platform, all aspects that can contribute to an improvement in terms of emotional connection must be taken into account.

The results also show, echoing Schmittel et al. [31], that online training lacks informal spaces for closer contact between trainees and supervisors outside the formal training space. For this reason, the interviewees propose the creation of "coffee spaces" within the platform to offer the opportunity to establish a closer bond, which also contributes positively to group interaction and group learning [42].

Another difficulty, one that was pointed out especially by the trainees, is access to a good internet connection, with good audio and video quality. In addition, both trainees and supervisors point out the lack of training in the use of technological tools [30, 34]. For this reason, an effort will be made to create a robust technological infrastructure to guarantee as much as possible good audio and video quality and a platform that is so intuitive that it does not require specific training [43], as also commented by the interviewees.

As this is an online platform, it must offer a solid and very intuitive structure that allows good usability, taking into account the WAI-AAA accessibility criteria [44, 45] as well as using an idiomatically and culturally inclusive language. Given the aforementioned language difficulties, it will also be very important for the platform to be able to offer a simultaneous translation of the training content and therapeutic conversations in order to reach all people in an inclusive way.

The structure of the platform must also be solid in terms of offering different multi-format resources, including a communication channel to monitor families and trainees, gamification of some content [46, 47], the possibility to take notes on the platform itself, and access to a synchronised calendar that makes it possible to overcome time zone issues.

In addition, as the interviewees suggest, the platform could automatically transcribe and record the sessions for later review, so that professionals can rethink and reflect on everything that has happened. The interviewees suggest that the recordings should be "in custody" of the supervisors to protect the privacy of families. They also suggest a feature to take notes together with the transcription and the recording of important elements. All these tools would likely be very useful for the learning of the trainees as well as for the evolution of the cases, but it is worth noting that, as the majority of the supervisors underline, one must be very professional to guarantee the confidentiality and privacy of the clinical data and material [33, 34, 48–50].

Regarding the limitations of the study, the supervisor participants had a good deal of experience in face-to-face family intervention training, however, like the trainees,

none of them had any experience prior to the arrival of the COVID-19 pandemic with observation and live supervision of real cases online. This limitation shows the need for supervisors and trainees to continue experimenting with this online format so that further research can be carried out to assess its effectiveness.

This analysis reveals the need to create a platform that can overcome the aforementioned difficulties and enhance the benefits of digitization for family intervention training, offering advantages that until now have not been covered by existing video conference tools. The UN [7] in 2015 approved 17 Sustainable Development Goals for 2030. The present study, which analyses the needs for the development of a platform for online training in family intervention through live online supervision of real cases, closely addresses two of these goals, namely, health and wellbeing and education. Guaranteeing a healthy life, promoting well-being and quality education are all essential for sustainable development. The platform outlined here would give professionals greater access to education and allow them to better develop their professional skills and, in turn, improve their living conditions.

Based on this analysis, we present a prototype of the platform for training in online family intervention through live online supervision of real cases that aims to cover the previously analysed needs, as depicted in Fig. 1.

To develop the platform on a technological level, a main requirement will be that it is accessible from any device. A web platform will be developed, which automatically adapts to different sizes of computer, mobile and tablet screens. It will be accessible from any browser without having to instal any software. In addition, it will be essential to guarantee the security and privacy of all session participants. For this reason, two types of encryption and different security filters will be used to protect data on users and sessions.

Any supervisor will be able to register on the platform as an administrator and then they will be able to send a link to enter the session to the trainees and the family. Trainees and family will have to ask to join the session, and the administrator will accept their entry. Once a user enters a session, they will find themselves in one of two different situations: they will see and hear all the participants in the video call (observation room), or only the patients and the therapist (session room). From a developer's view point, it will be the same video call, but each particular user will only be able to access certain videos and audios. The administrator user will be able to decide which room each user is in and thus allow both the trainees and the supervisor himself to enter and leave the session room. At the programming level, each time a user changes rooms, each participant's device will be programmatically notified and reload what they can see and hear, and the screen of all users will be updated without them having to do anything.

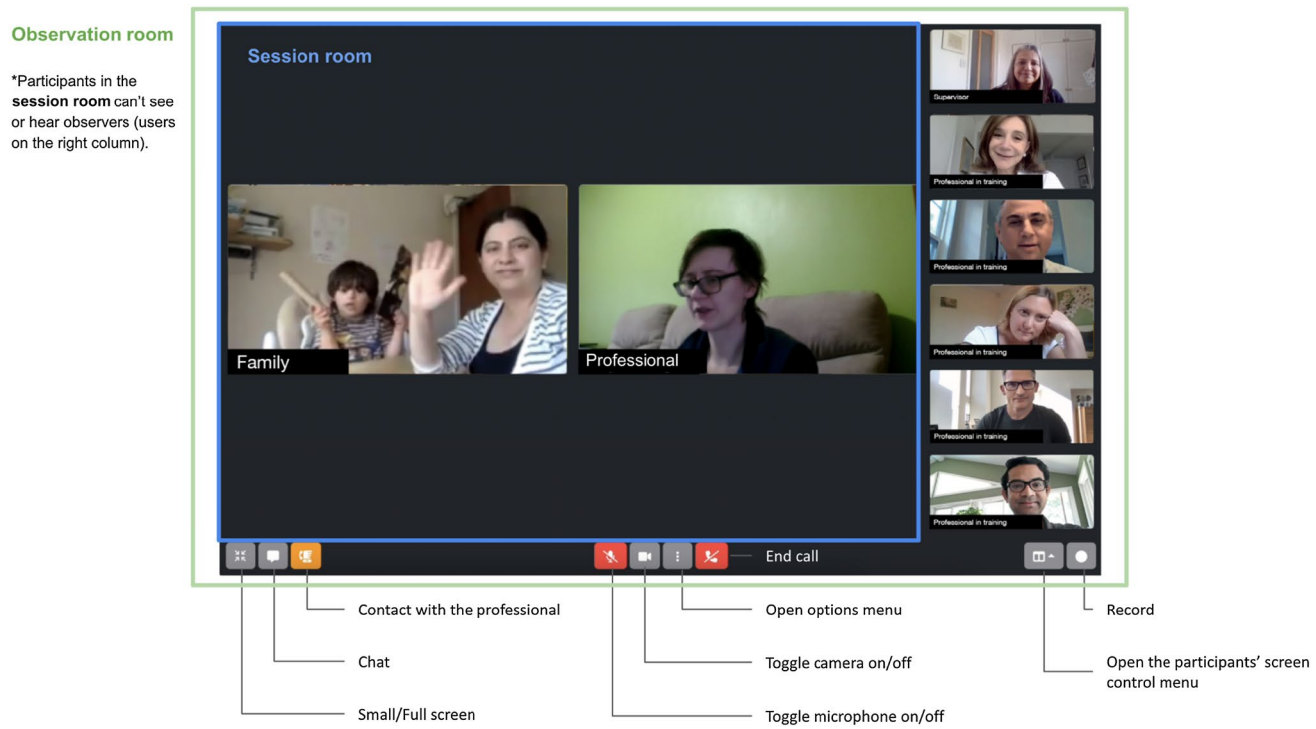

Fig. 1 Platform prototype for training in family intervention through direct online supervision of real cases (ePsychology Academy)

The following technologies will be used to develop this system:

- *Laravel*: PHP-based framework, which gives control of all the tasks that are carried out on the web server and manage the database. It will also be in charge of determining the permissions that users have before accessing video calls;
- *VueJS*: Javascript-based framework tool, which manages all the elements that a user interacts with on their device. For example, when you are on a video call and Laravel has determined the user's permissions, VueJS will manage the controllability of the video call room you are in, deciding which buttons will be visible and which you users will be able to see and hear during the video call;
- *InertiaJS*: Javascript-based development tool that connects Laravel and VueJS. This will manage which parts of the screen should be modified and which should not. In this way, the page will never have to be fully reloaded, only parts of it. This will increase the speed significantly for users and give them the feeling of using a downloaded application instead of a website.

5 Conclusion and prospects

The results have made it possible to collect information and gain a deeper understanding of the benefits and difficulties involved in online training in family intervention through live online supervision of real cases, as well as the specifications that a digital platform must offer for good training.

As a result of the analysis, there is a clear need to create a digital platform that can enhance the benefits of digitalization in training in family intervention and offer advantages that until now have not been covered by existing videoconferencing tools. This will allow geographical barriers to be broken and will offer the possibility to connect with a greater number and more diverse professionals (supervisors and trainees), something that could not be otherwise accomplished in the 100% face-to-face format, since it would not be sustainable nor accessible.

Thus, the proposed digital platform should be able to offer direct online supervision with a virtual session room in which a professional works with the patients and another virtual observation room where the session is viewed live, the different observers see each other and they communicate through the platform itself. The goal is to make it easier for trainees to understand different models of exploration and family intervention without having to attend sessions in person. This modality is intended to be useful both for professionals who are beginning their professional practice and for those who wish to do live supervision at any time during their clinical practice.

This study supports the rebuilding of a post-COVID-19 Europe that is greener, digital and more resilient. The needs analysis for the design and creation of a platform is an impulse towards the digitization of health and social resources. The aim is to ensure that the tool facilitates the daily management and training of professionals, as well as to contribute to the resilient adaptation to situations such as the one experienced during the COVID-19 pandemic, in which the need for online and easy-to-use resources has been verified.

As a future perspective, we intend to develop the ePsychology Academy platform at a technological level, taking into account all the benefits, difficulties and benefits found in this study in order to implement and validate the use of the platform at a technological level in a relevant environment.

The current project has participated from September 2021 to November 2021 in The World Capital Barcelona programme “On Campus, The Collider " in collaboration with the Generalitat de Catalunya and was selected on 3 March 2022 by the Center for Research on Medicine and Innovative Technologies (CIMTI), with the support of the Department of Health of the Generalitat de Catalunya to be promoted as an innovative project in the field of mental and social health.

Acknowledgements The authors are grateful for the training offered in the "On Campus, the Collider"' programme in collaboration with the Generalitat de Catalunya and for the support of the Center for Research in Medicine and Innovative Technologies (CIMTI) in promoting this study as an innovative project in the field of mental and social health.

Funding Open Access funding provided thanks to the CRUE-CSIC agreement with Springer Nature.

Declarations

Conflict of interest The authors declare no conflict of interest.

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