Barriers and facilitators in the usability of an integrated blended care program in patients with medically unexplained physical symptoms from the healthcare professionals' perspective; a qualitative study.

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Abstract

Background: Increasingly, healthcare policies have changed focus from cure and care to behaviour and health. Prevention is becoming more important, which requires a change in the role of healthcare professionals. Healthcare professionals' role is changing from being a therapist to taking on the role of a coach. To prevent chronicity in Medically Unexplained Physical Symptoms (MUPS), an integrated blended care program was developed. To apply this new program in daily practice, it is important to gain insight into the usability. From the healthcare professionals' point of view the concept of usability consists of performance, satisfaction and acceptability.

Methods: Data were collected from semi-structured interviews, which were recorded and transcribed. Data were analysed manually and independently by two researchers.

Results: Ten healthcare professionals (six physical therapists and four mental health nurses) were interviewed. Six core themes on usability were identified: (1) selection and motivation of patients, (2) training and doing, (3) program procedure, (4) maturity of the e-Coaching application, 5) interprofessional collaboration and (6) expectations and experiences.

Conclusion: An integrated blended care program offers the possibility to personalize treatment. This study gathered healthcare professionals' experiences with and attitudes towards integrating healthcare and offering blended care programs. Findings show attention should be given to the new responsibilities of healthcare professionals, and their role in integrated and blended care. This new approach of delivering healthcare can facilitate interprofessional collaboration. Achieving sustainable change in patients however still requires instruction and support for healthcare professionals implementing behavioural change techniques.

Trail registration: The study was approved by the Medical Ethical Committee Utrecht, by number 17/391. Registered 14 June 2017, <https://www.metc-utrecht.nl/>

Keywords: usability, medically unexplained physical symptoms, blended therapy, e-Coaching, healthcare professionals

Background

Over 75% of the Dutch population visited the general practitioner (GP) in 2018 with an average of 4.5 visits per person per year (1). About 30% of symptoms, e.g., pain, fatigue or dizziness (2) remain medically unexplained after patients visits their GP (3)(4). In most patients these symptoms disappear spontaneously after a few weeks. Nevertheless, for 2.5% of these patients, symptoms sustain and have a high impact on daily life (3)(5). These so called Medically Unexplained Physical Symptoms (MUPS) are physical complaints that last for at least a few weeks, where no somatic condition is found that explains the complaints with adequate medical examination (2).

Providing appropriate treatment for people with MUPS at an early stage has multiple advantages. MUPS can be divided into three consecutive stages, ranging from mild, to moderate to chronic stages. These stages are based on the frequency of consultations to the GP, duration of symptoms and experienced physical and/or psychological dysfunction (6). The literature shows effective outcomes on the reduction of unnecessary medical consumption, and increased job participation (7)(8). Prevention in relation to MUPS seeks to identify individuals who show early signs of MUPS (9).

In order to maintain healthcare accessibility and affordability, policy in the Netherlands has sought to change the way in which healthcare is organized. Moving from a focus on cure and care to behaviour and health (10). This change requires a shift in healthcare delivery with more focus on prevention, from a traditional expert to a patient-centred approach (11). Therefore, the role of healthcare professionals also has to change, moving from focus on being a therapist to focus on being a coach (12).

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87 Recently, such an integrated blended care program to prevent chronicity in MUPS, the
88 PARASOL program, has been developed in collaboration with healthcare professionals and
89 patients (13). This specific program focuses on increasing insight into patients' perception of
90 symptoms and modifiable prognostic risk factors for chronicity using therapeutic neuroscience
91 education and encouraging self-management as well as an active lifestyle using a cognitive
92 behavioural approach and graded activity (13). Blended care is the combination of online care
93 and therapeutic guidance (14). Online care was provided using e-Coaching and therapeutic
94 guidance through face-to-face treatments by physical therapists and mental health nurses. E-
95 coaching is defined as 'the use of technology during coaching to motivate and stimulate (groups
96 of) people to change attitudes, behaviours, and rituals' (15)(16). E-coaching provides
97 information modules, personalised exercises and assignments to gradually increase the
98 physical activity in a web based application and is not a standalone, but integrated in care.
99 Online programs can not only be supportive of usual therapeutic guidance, but can also be a
100 substantial element of the intervention as a whole (17)(18). The combination of personal
101 attention of a healthcare professional and the accessibility of an online tool is seen as highly
102 promising, as it can stimulate patients to take an active role in their disease management (19).

103

104 To implement a successful innovation, attention should be given to the unique position of end-
105 users (16). The involvement of end-users provides direction for the development of integrated
106 blended care programs. Co-creation, the engagement of users throughout the development
107 process, is an important strategy in order to meet the values and needs (20). In order to apply
108 this program in the daily practice, it is important to gain insight into the concept of usability,
109 consisting of performance, satisfaction and acceptability. Usability refers to 'the quality of a

system with respect to ease of learning, ease of use, user satisfaction and needs to be tested subjectively, from end-users perspective' (21). This qualitative study investigates the usability of an integrated blended care program to prevent chronicity in MUPS from the healthcare professionals' point of view, specifically with regard to the usability of the PARASOL program.

Methods

A qualitative design was chosen. Data were collected through semi-structured interviews with healthcare professionals recruited after participating in the clinical trial PARASOL (13).

PARASOL program

The PARASOL program is a protocolled 12- weeks integrated blended care program. The program consists of five face-to-face consultations with a physical therapist and four sessions with a mental health nurse in primary care, supplemented with e-Coaching (figure 1) (13). Physical therapists and mental health nurses received instructions about the program during a two-day training session. These instructions included presentations on the study population, central sensitization, therapeutic neuroscience education, graded activity, and perpetuating factors (13). Furthermore, professionals were instructed on how to integrate E-coaching. All healthcare professionals received a protocol. Three months after the two-day training the PARASOL program started.

The e-Coaching modules consisted of information modules and videos on self-management and educative themes, videos and instructions on prescribed home exercises and assignments to gradually increase physical activity. Content was directed at patients' perception of symptoms, and modifiable prognostic risk factors for chronicity using therapeutic neuroscience education and encouraging self-management as well as an active lifestyle using a cognitive

behavioural approach and graded activity. The e-Coaching modules complemented face-to-face treatments in order to introduce general themes, while during the contact with healthcare professionals, treatment could be personalized. Furthermore, during face-to-face treatment patients could pose questions to healthcare professionals. The basic functionality of e-Coaching used is based on the blended exercise intervention for patients with hip or knee osteoarthritis, called e-Exercise (22).

Figure 1: Overview of the PARASOL program.

The text cloud indicates the face-to-face contact with a physical therapist (PT) and/or mental health nurse (MHN), the computer image indicates e-Coaching. The numbers represent the number of the week the related sessions were aimed.

Sample

Convenience sampling was used whereby all healthcare professionals involved in the clinical trial (seven physical therapists and six mental health nurses), were eligible to participate. Healthcare professionals were approached by the researcher (ST). Instructions were given by

phone, information was sent by email and an appointment was made. Subsequently, informed consent was obtained.

Data collection

Semi-structured interviews were used to shed light on the usability of the integrated blended care program. Interviews were conducted by ST in a one-to-one semi-structured interview. A second researcher was present for non-verbal observation and verified if all questions were asked. The interview guide was based on the theoretic construct of De Bleser et al 2011, offering direction to the interviews (21). This construct divides criteria in objective and subjective dimensions. This study focused on the subjective dimension, containing user performance, satisfaction and acceptability (21). The interview guide was supplemented by determinants of healthcare innovation selected and developed by TNO (23). After the first interviews were conducted, the interviewer added questions based on topics that emerged from previous interviews. Besides qualitative data, demographic data of healthcare professionals was collected, specifically their age, gender, profession, work experience, number of patients treated in the PARASOL program and the System Usability Scale (SUS) score. The SUS consists of ten questions about the user satisfaction of a system, in this case about the e-Coaching of PARASOL (24). The questions were answered on a numeric rating scale with a score range of one to five. A score of one stands for 'strongly disagree' and a score of five stands for 'strongly agree'. The validated classification of the SUS of <70, a score between 70-80 or a score >80 respectively represent low, medium and high user satisfaction. The SUS has a high reliability ($\alpha=0.911$) (25). SUS scores were collected before the interview started and give information on the extent to which satisfaction with e-Coaching varies.

174 *Data analysis*

175 Interviews were recorded and transcribed verbatim and the audio interviews were checked by
176 two researchers (ST & EP). Within one week after completing the interview, a brief summary
177 was sent to all participants to ensure all information was interpreted correctly. Data were
178 analysed manually and independently by two researchers (ST & EP) using constant comparison.
179 During the initial process of open coding, transcripts were analysed line by line by the same
180 researchers, allowing the data to be fractured, to identify emerging lower-level concepts. These
181 codes were highlighted and labelled within the text. During the axial coding process, fragments
182 were put together. Axial coding then allowed the data to be reassembled, whereby lower-level
183 concepts were extracted and conceptually grouped into subcategories and then categories.
184 These concepts were categorized according to their similarities, after which main themes
185 emerged, which were described and discussed by the researchers (ST, EP & MN).

186

187 *Validity*

188 Validity was increased by creating a non-judgmental atmosphere during the interviews and
189 emphasizing the need to learn from the healthcare professionals. Transcribing the interviews
190 decreased the chance of bias. The use of researcher triangulation in all the phases of the study
191 enhanced the validity of the interpretation. Furthermore, the interpretation of the given
192 answers was checked by the member check.

193

194 *Ethical considerations*

195 The study was approved by the Medical Ethical Committee Utrecht, by number 17/391. The
196 datasets used and analysed during the current study are available from the corresponding
197 author on reasonable request.

Results

Among the healthcare professionals contacted (seven physical therapists and six mental health nurses), two refused participation because they were not interested. One healthcare professional did not respond. In total ten healthcare professionals (six physical therapists and four mental health nurses) were interviewed. The demographics of the participants are displayed in table 1. Of the ten participants, eight were female. Participants ranged in age from 25 to 62 years with a mean age of 35 years. Work experience ranged between 1.5 to 34 years. SUS scores ranged from 30 to 82.5, which implies eight healthcare professionals scored a low satisfaction, one a medium satisfaction and one healthcare professional scored a satisfaction (25). The interviews lasted between 30 to 45 minutes.

Table 1: Demographics of participating healthcare professionals

Participant	Age (years)	Gender	Profession	Work Experience (years)	Patients treated in Parasol program (n)	SUS score
1	25	Female	PT	1.5	6	60.0
2	62	Female	MHN	15	11	52.5
3	30	Female	MHN	3.5	17	82.5
4	53	Male	MHN	34	11	30.0
5	31	Female	PT	8	8	32.5
6	37	Female	MHN	15	10	55.0
7	29	Male	PT	6	6	32.5
8	28	Female	PT	*	6	52.5
9	28	Female	PT	6.5	11	75.0
10	29	Female	PT	3	17	62.5

* Missing data. Physical therapist (PT), mental health nurse (MHN)

Besides demographics, questions about previous experiences with blended care (interest in blended care, expectations of integrated blended care programs) were asked. Most healthcare professionals volunteered to participate in this study out of personal interest in the subject matter. Although not everyone had previous experience with blended care, expectations of the blended program were cited as something new that fitted them well, and seen as the future of primary care. Although the healthcare professionals were optimistic about blended care, some were also afraid that the online program would take over their jobs. Through questions about usability from healthcare professionals point of view, facilitators and barriers to implement an integrated blended care program were found. These are summarized in table 2.

Table 2: Summary of facilitators and barriers linked to the core themes.

Core theme	Facilitator	Barrier
<i>Selection and motivation of patients</i>	Intrinsic motivation of patients	Chronicity of complaints
<i>Training and doing</i>	The use of a protocol	Duration between training and doing
	The number of patients treated	
<i>Program procedure</i>	Achieving in depth treatment within the duration of a session	Absence of evaluation time at the end of a program
		Difficulties setting (long-term) goals
		Difficulties in delivering care remotely, like e-Coaching
<i>Maturity of the e-Coaching application</i>	Quality and structure of content	Technical issues
	Providing information interactively (text and video)	
<i>Interprofessional collaboration</i>	Holistic approach	Lack of feedback or confirmation from other disciplines
	Support of colleagues	
<i>Expectations and experiences</i>	Insight at patients' level	
	Patients' self-management skills	
	Preparedness of patients	

As seen in table 2, the analysis resulted in six core themes. The themes are presented according to the sequence of the integrated blended care program.

1. Selection and motivation of patients

In the interviews, multiple situations were reported that hindered or favoured participation of patients in this integrated blended care program. The fact that the patient population strongly varied was repeatedly mentioned. Interviewees felt this integrated blended care program was not suitable for all included patients, specifically patients suffering from MUPS for a long time. Those interviewed felt that the intrinsic motivation of patients plays an important role in successfully completing the program. When describing their motivation, interviewees divided patients into roughly two groups; those motivated and those not motivated. Expectations of the study diverged between both groups. Motivated participants were well prepared and knew that the program had a low intensity and included guidance from a distance. Interviewees felt the outcomes for those less motivated were less positive, as they did not have a goal they could or wanted to work towards. *'If patients are too unprepared...I won't say they're less motivated, but they see themselves less as a problem owner (p2)'*. Although these patients were perhaps less motivated, healthcare professionals did not see it as a significant problem, as they expected less motivated patients to drop out at the start of the program. *'The people that aren't motivated, they'll drop out, they filter themselves out of the program (p3)'*.

2. Training and doing

Before the start of the program, healthcare professionals had to attend a two day training in order to treat patients following the protocol of PARASOL independently. Some professionals learned a lot during those days, while others felt they knew sufficient about the subject matter at hand. A downside which was expressed was the long period between the

introductory training and the start of the first treatment in the program. During the training days, an instruction protocol was handed out. Healthcare professionals used this protocol in different ways, as some mentioned they followed the protocol strictly. They stated they really tried to use the exact same words as in the protocol to help recognition by the patient. Others stuck less to the protocol. *'I never try to just plainly follow it, because then you lose contact with what is happening on the other side (p3)'*. Furthermore, the number of patients treated was mentioned as an important factor to make the program their own. Interviewees expressed that as they treated more patients, they better mastered the program. *'You can only make it your own if you see a lot of patients in a row (p6)'*.

3. Program procedure

This theme emphasises the experiences with the program procedure, such as the treatment duration and frequency. Overall, there was satisfaction with the session time of 25 - 30 minutes. Only during intake this was experienced as too short. Interviewees suggested doubling the time during intake to gain a wider picture of the patient. Concerning the treatment frequency of the program, the main point put forward was the need for an evaluation moment at the end. Interviewees wanted to know what the program had meant for their patients. *'I just give a bunch of information to the patient, but have no clue whether it sticks with them (p2)'*. Especially during week 6 and 12, where there were only online modules and the treatment frequency was experienced as too low. Interviewees expressed there was a need for an additional appointment. *'Sometimes it's just taking enough time and repeating, after which you think, this finally makes sense (p6)'*. In some cases, patients did not have any questions for the healthcare professionals. This made it hard for them to know if there was sufficient commitment. *'It's a bit indecipherable (p4)'*. Healthcare professionals struggled to formulate long-term goals with patients. Due to the open-ended character of

the program for the patient, some interviewees felt goals were hard to achieve. For some patients the 12-week program was not enough to realize their goals, however healthcare professionals were happy to notice what they had achieved in such a short time.

4. Maturity of the e-Coaching application

During the integrated blended care program, e-Coaching was used to provide online care in addition to the face-to-face contacts. In terms of content, the information modules were perceived as well written and structured. Patients were given information in different ways (reading online, watching instruction video's) causing the information to stick better, as well as stimulating self-management among patients, which reduced healthcare professionals' workload. *'Texts were written in such a way (...) that people recognize themselves in it, they don't put off people (p7)'*. Besides, *'It is important that people get to process information in different ways, as our brain doesn't work like: 'hi, let's change something'. So that's really necessary (p2).'* There were also a number of criticisms regarding the accessibility of the e-Coaching modules. They were reported as not being user-friendly and unclear. In addition, it was mentioned that there were many technical complications, such as difficulties with logging in and useless buttons. The professionals expressed doubts as to whether the e-Coaching application can offer functionality. *'... I wouldn't accept it if I couldn't log in (...) then I would really ask my money back (p2)'*. Healthcare professionals sought to deal with the technical defects as good as possible. Some printed exercises and others emailed them to the patients, enabling patients to still follow the program.

5. Interprofessional collaboration

One of the main added values mentioned was interprofessional collaboration between physical therapists and the mental health nurses induced by the integrated blended care program. Before the start of this program, it seemed as though healthcare professionals did

not actively seek collaboration. *'I got to know the mental health nurse through this project (p8)'. Through working together in this program, professionals better found each other. Contacts between professionals was easy to establish. Nearly all participants found the collaboration pleasant, helpful and experienced it as adding value because of the holistic approach. 'She sees things that I do not. I see things that she does not (p1)'. 'That you seek cooperation, but stay within your own field (p6)' 'The added value is in the coordination (p4).'*

After the treatment was finished, most professionals continued to collaborate. They mentioned consulting each other more often. During the program there was little support or contact with the general practitioner (GP). This was not mentioned as being problematic, yet some interviewees indicated some feedback or confirmation by the GP would have been nice for reassurance. Support of colleagues was experienced as motivating and stimulating.

6. Expectations and experiences

The interviewed healthcare professionals were generally positive about the integrated blended care program. A positive point highlighted was the insights the program gave into patients. Patients became more self-managing of their problems. *'They really become problem owner! (p2)'. Healthcare professionals noticed that patients became more aware of their responsibility for their own health. As patients started the program at home, they found that patients were better prepared. This made the healthcare professionals able to get to the core of the treatment faster. 'Part of what is told, is already told online. The patient can see and read it himself. That saves time during treatment. (p3)' 'I notice patients learn a lot when they read material at home or watched a video (p9)'. Most healthcare professionals already used their knowledge of the integrated blended care program in their current treatments. Some hoped it would be implemented as usual care. It was a unique experience, which relieved the workload and should*

therefore be implemented in usual care: '*... if people return, they changed something and are enthusiastic and proud about that. That they reached goals they didn't expect to (p5)*'.

Discussion

This qualitative study was conducted to investigate the usability of an integrated blended care program from healthcare professionals' perspective. Semi-structured interviews were held, out of which six core themes emerged with accompanying facilitators and barriers.

The main facilitator in this integrated blended care program was the depth in treatments and the possibility to personalize the program. Patients received information in multiple ways and in different stages of the program. Prior to the face-to-face treatment, patients received information in text and saw instruction videos at home. Later, in face-to-face appointments with healthcare professionals, they could ask their questions or share their doubts. Patients were better prepared about what was going to happen next. Furthermore, repeating information made patients better prepared which saved time and allowed healthcare professionals to move on to the core of treatment faster. Repetition is a known behavioural change technique, as with repetition individuals better develop skills to actively self-regulate their behaviour (26). Another facilitator was the presence of two different types of healthcare professionals which led to a more holistic treatment. The two professions worked from their own vision, making the treatment as thorough as possible. After the program was finished, professionals had better gotten to know each other, and were actively seeking collaboration. It is remarkable that the collaboration picked up so fast, as literature shows interprofessional collaboration between healthcare professionals is complex (27). Professionals have their own educational background and are socialized to adopt a discipline-based vision of their patients

and the services they offer. Collaboration requires making changes to this paradigm (27), which apparently succeeded in this blended treatment.

An important barrier in the use of the blended care program was the selection of patients. Participating healthcare professionals did not have the feeling all patients were suited to participate in the program. This could be due to the condition of MUPS, which is hard to define and does not have clear criteria (28). Healthcare professionals could quickly tell if a patient was motivated or not, which they seemed to find a predictor of succeeding with the program or not. It seems required to first invite patients to share their motivations, personal needs and preferences before starting an integrated blended care program (14). Patients were selected through a proactive approach. An electronic screening method using data from the electronic medical record of the patients' GP was used (29). All eligible patients who were at risk for chronicity of complaints were proactively approached by their GP via an invitation letter explaining the study. By approaching patients proactively, the chance of finding patients who may be less motivated and less clear about what they want to achieve within the intervention may increase. One should therefore take motivation and personal help-request into account in future programs.

The most frequently reported barrier in the application of the integrated blended care was dealing with the autonomy regarding decisions about when and how to stick to the treatment protocol. For instance, professionals felt more time was needed during the intake, felt the need for an evaluation or booster session, and experienced the need for treating more patients following the protocol. Additionally, healthcare professionals struggled with the fact that their role changed into being more of a coach. They had difficulties seeking to formulate long terms

goals with their patients. The feeling was patients did not have a specific help-request. This could be due to fact patients were better prepared. Furthermore, this preventative approach was new, which was hard to get used to. More insights are necessary into how to coach professionals on behavioural change techniques and how to organize healthcare around it (30)(11)(12).

Other perceived barriers included the lack of accessibility of the e-Coaching modules, which was also reflected in by the reported SUS scores. Eighty percent of interviewees gave SUS scores below 70, which implies a low user satisfaction (24). Technical problems were experienced as hindering factor, and the need for user-friendly technical solutions has been repeatedly expressed in the literature (31)(32)(33). The successful implementation of the integrated blended care will certainly require a more sophisticated technical setup, that is free of typical starting problems. Based on the results of the current study, a new application was developed which shows promising technical support.

A limitation in this qualitative study is that all findings are based on one specific integrated blended care program (PARASOL). Certain core themes hence are directly linked to this specific program. Recommendations however are applicable when starting any integrated program with a blended approach. A further limitation is the theoretical construct chosen (Bleser et al), which contains performance, satisfaction and acceptability (21). Other theoretical constructs could also have been applied. Examples are the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM). In their core, these constructs however are comparable (34)(35). UTAUT however lays more focus on the social

influences in relation to behavioural intention, while TAM focuses more on the perceived usefulness and ease of use.

Conclusion

An integrated blended care program offers the possibility to personalize treatment. This study gathered healthcare professionals' experiences with and attitudes towards integrating healthcare and offering blended care programs. Findings show attention should be given to the new responsibilities of healthcare professionals, and their role in integrated and blended care. This new approach of delivering healthcare can facilitate interprofessional collaboration. Achieving sustainable change in patients however still requires instruction and support for healthcare professionals implementing behavioural change techniques.

Abbreviations

GP	General Practitioner
MHN	Mental Health Nurse
MUPS	Medically Unexplained Physical Symptoms
PT	Physical Therapist
SUS	System Usability Scale
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology

Declarations:

- Ethics approval and consent to participate

The study was approved by the Medical Ethical Committee Utrecht, by number 17/391. Informed consent was obtained from all individual participants included in the study.

- Consent for publication

Not applicable

- Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

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- 415 • Authors' contributions
- 416 ST, MP en CV initiated this study and contributed to the concept and design of this
- 417 study. ST organized and participated as interviewer and EP participated as observer. ST
- 418 en EP analysed and interpreted the data. MN conducted the role of qualitative expert.
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