Organisational Implementation Climate in implementing internet-based Cognitive Behaviour Therapy for depression

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Abstract

Background. In the MasterMind project, Internet-based Cognitive Behaviour Therapy (iCBT) services for depression have been implemented in routine care in 14 European regions. This study aimed to advance understanding of the nature and value of organisational implementation climate in implementing iCBT services from the perspectives of implementers and service deliverers.

Methods. A mixed method approach was applied. Based on principles of concept mapping, a structured workshop with implementers was conducted to qualitatively conceptualise organisational implementation climate conducive to optimizing iCBT use in routine practice. Mental health service delivers involved in the provision or referral of patients to the implemented iCBT services were invited to participate in a cross-sectional survey assessing levels of satisfaction and usability of iCBT, and organisational implementation climate. Associations between satisfaction, usability and implementation climate were explored.

Results. 16 implementers representing 14 service delivery organisations participated in the workshop. The top-3 characteristics of a strong organisational implementation climate included: (1) clear roles and skills of implementers, (2) feasible implementation targets, and (3) a dedicated implementation team. The top-3 tools for creating an implementation climate included: (1) job performance feedback, (2) progress monitoring in relation to achieving implementation targets, and (3) guidelines for assessing the impact of iCBT. In total 111 respondents (73% female) completed the survey. Mental health service deliverers were generally satisfied delivering iCBT services (M_{CSQ} = 9.11, SD = 1.96, range = 3-15, *n* = 108) and found their usability slightly below average (M_{SUS} = 63.76, SD = 15.53, range = 0-100, *n* = 103). They regarded their organisational implementation climate as supportive in implementing iCBT services (M_{ICS} = 43.21, SD = 5.62, range = 12-60, *n* = 89). Organisational implementation climate was weakly associated with the system usability scale (*r* = 0.25, *p* =.03) and moderately with the satisfaction scale (*r* = .51, *p* £ .00).

Conclusions. Organisational implementation climate as part of the wider organisational context in which implementation processes take place, is a relevant factor to implementers and service deliverers in implementing iCBT in routine care. The qualitative conceptual findings align with the quantitative approach applied in this study for measuring organisational implementation climate. Implementers can use various practical tools to shape organisational implementation climate to increase acceptance and subsequently improve implementation of iCBT in mental health care.

Contributions To The Literature

- This study contributes to advance understanding of the nature and value of organisational implementation climate in implementing iCBT services in routine mental health care in 14 different European regions.
- Two different perspectives are studied: 1) implementers and 2) mental health service deliverers in primary and specialised mental health care settings
- Mixed methods are used to combine a qualitative conceptualisation of organisational implementation climate and tools for attaining a strong implementation climate with a cross-sectional survey assessing perceived acceptance and organisational implementation climate. The qualitative conceptual findings align and validate (face value) the quantitative approach for measuring organisational implementation climate.
- Enrichment of the conceptual understanding of organisational implementation climate is enriched. It is not only an inherent property of the context in which implementation activities take place; it might also be intentionally shaped to enhance impact of those activities.

Background

Common mental disorders such as anxiety and depressive disorders, are amongst the most prevalent mental disorders around the world [1]. Internet-based Cognitive Behavioral Therapy (iCBT) can increase the reach and accessibility of mental health services [2] with comparable clinical effects to face-to-face CBT [3–5]. In addition, iCBT services in general are found to be

appropriate and acceptable strategies in treating common mental health disorders [6–8]. Consequently, various initiatives emerge across the globe to implement iCBT services in routine care [9].

In the context of the European MasterMind project, various iCBT services for adults suffering from mild, moderate or severe depressive disorder were implemented in 14 European regions [10]. After two years of service deployment, over 11,000 patients were offered iCBT services in primary and specialised routine mental health care settings [11]. A pre/post-test of the MasterMind project showed that 44% of the patients who received one or more session (n = 4,480, 58% of those who completed the full treatment, n = 1,882), improved clinically in one or more symptom severity categories [12–14]. Patients reported in general to be satisfied with the iCBT service as measured with the Client Satisfaction Questionnaire (M = 24.14, SD = 5.63, range 8–32, n = 655) and found the iCBT services usable on average (M = 67.83, SD = 16.54, range 10–100, n = 615).

Both perceived appropriateness and acceptability by mental health service providers are known to be important determinants of successful implementation of iCBT services in routine care [15–18]. Appropriateness refers to the perceived and proven fit of iCBT in treating common mental disorders and acceptability concerns the perception of users including patients and service providers that the iCBT service is palatable or satisfactory in its use [19]. Besides individual level factors related to the intervention that is implemented, also the context in which it is implemented on group level can hamper or facilitate implementation efforts [20]. These contextual factors can operate on the level of the health care system, such as rules for reimbursement, certification, and staff accreditation, as well as on organisational level. such as social and climatic characteristics, financial resources, and skills of service delivery staff [17]. Barriers on the level of organisational context might be more sensitive to change whereas system level barriers are often outside the influence of service deliverers and implementers. Furthermore, the organisational context in which the service delivery and implementation takes place, is of particular relevance as it forms the 'biotope' in which patients and service deliverers act and interact to create health and healthcare [21, 22]. Figure 1 provides a schematic simplification of a possible model of implementation success indicating potential relations between intervention characteristics (appropriateness and acceptability), the wider organisational context, and main actors involved in delivery and uptake of iCBT services (ie. patients and service deliverers).

[Figure 1: Conceptual model of implementation success, intervention characteristics and wider organisational context. The relation between organisational implementation climate and acceptability of iCBT services that were implemented, was the subject of this explorative study.]

Organisational context as defined in the Consolidated Framework for Implementation Research (CFIR), includes structural characteristics (age, size, and governance structure of the organisation), networking qualities (formal and informal communications within and beyond the organisation), and aspects of the organisational implementation climate by which implementation processes are facilitated or inhibited [20]. Of particular interest is the concept of organisational implementation climate which can be defined as the shared meaning (or disagreement) staff members attach to organisational events, practices and procedures they experience and the behaviours they see being rewarded, supported, and expected in implementing evidence-based practices [23–26]. Organisational implementation climates are possibly relevant to investigate as they are known to shape staff members' attitudes towards adopting and implementing evidence-based interventions into daily practice [24, 25, 27] and professionals perceptions are of particular interest in successfully implementing new interventions [28, 29].

Organisational implementation climate can be considered as a conglomerate whole that includes staff members' shared understanding of and experiences with organisations' formal and informal policies and practices related to implementing new practices [30]. Through discussion and collaboration, and in the context of these organisational policies and practices, staff members develop a collective sense of what is expected from them, how this can be achieved, and what possible consequences it might cause. Translated to the context of adult mental health care, service deliverers such as psychologists, psychiatrists, nurses, and general practitioners might for example, be inclined to improve efficiency of existing treatments over learning new ways of engaging with their patients when they are predominantly evaluated and rewarded for their productivity in their job performance evaluations. Alternatively, service deliverers might be more open to changing their normal ways of working and integrating new treatments in their daily practice when they are encouraged by organisational policies and time registration systems, to devote a reasonable part of their employment to try-out evidence-based treatments that are new to them.

Organisational implementation climate can be characterised in various ways. For example, one characteristic concerns service deliverers' commitment and loyalty to the organisation and its' goals. Commitment and loyalty to the organisation can be considered to be part of a broader construct about individuals' identification and relationship with the organisation and may affect the willingness to implement and use novel interventions such as iCBT services [20, 31]. Another defining characteristic is employees' perceptions of the levels of support, recognition and appreciation by their organisations for implementing new interventions as it can incentivise individuals to adapt or apply a certain behaviour facilitating implementation practices. [20, 24, 32]. For mental health service deliverers, examples of such incentives can include salary raises, a promotion to team leader or a supervisory role, gratifications, conference visits, and increased stature, respect and trust by granting more autonomy in treating their patients. Another characteristic of organisational implementation climate includes staff members' confidence in their own ability to change their practice and use new interventions such as iCBT in treating their patients. Self-efficacy is a significant component in most individual behaviour change theories [33, 34] and staff with higher levels of confidence are more likely to overcome barriers in implementing and using new interventions in daily practice. Furthermore, professionals' shared perception of the importance of implementing new interventions could be a relevant aspect shaping organisational implementation climates [20, 24, 32]. That is, when staff members are reluctant to prioritise the implementation of new interventions over other tasks, the decision to implement these interventions remains unenacted upon. Both self-efficacy and change commitment are two main determinants of what Weiner conceptualises as organisational readiness for change [35]. In this theory, change commitment is a function of change valence referring to staff members' motivation to change and their perceptions of the importance, added value, and effort that is required to successfully implement the new intervention. In turn, self-efficacy, or change-efficacy in Weiners' theory, draws on a social cognitive approach related to implementation capability and includes task demands, available resources, and other situational factors such as the extent to which the internal political environment supports implementation [35]. An implementation strategy, defined as an intervention used to enhance the adoption, implementation, and sustainability of a clinical program in practice [36], could be considered as a situational factor and a relevant feature of an implementation climate. Such strategies may provide structure and clarity in implementation processes through planning, engaging, executing and evaluating the implementation work. Similarly, the availability of qualified staff, number and adequacy of resources such as funds, training, and time available to implement and use the new services might be relevant factors characterising organisational implementation climates as they enable or hinder actual enactment of implementation strategies and carrying out the work [20, 37].

In the context of the MasterMind project, this study aimed to advance understanding of the nature and value of organisational implementation climate in implementing iCBT services in routine mental health care from two perspectives. From the perspective of implementers, ie. staff members tasked with implementing the iCBT services, we sought to qualitatively identify the characteristics of and practical tools for creating an organisational implementation climate conducive to optimizing implementation outcomes such as increased service uptake by mental health professionals. In addition, we explored whether measures of satisfaction, usability and organisational implementation climate are empirically associated in samples of mental health service deliverers.

Methods

Study setting

This study is part of the larger summative descriptive evaluation of barriers and facilitators in implementing iCBT services across Europe in the MasterMind project that ran from September 2015 until January 2017. Please refer to Vis et al (2015) for a complete overview of this summative implementation study.

Table 1 provides an overview of the iCBT services and the organisations involved in the Mastermind project. Nine different iCBT services were implemented. All implemented iCBT services were based on the main therapeutic principles of Cognitive Behaviour Therapy (CBT), covering sessions of psychoeducation, behavioural activation, and cognitive restructuring. Two services were designed as standalone self-help interventions by which only technical assistance was available to patients. Five iCBT services included a secure asynchronous messaging system by which therapists could offer coaching to the patients using the iCBT service. One service included a blended treatment protocol in which face-to-face sessions are combined with online sessions and

asynchronous therapeutic guidance. Eligible patients were identified locally and referred to the iCBT services through various pathways ranging from self-referral using standardised screeners, to referral by mental health specialists using a combination of screeners, interviews and clinical judgment. The participating organisations were divided into two implementation waves. Wave-1 organisations were more experienced in providing iCBT services and at the time, could be considered as early adopters due to their involvement in previous research and implementation projects of iCBT services. Wave-2 organisations had limited experience with iCBT services for depressive disorders in routine care and benefitted from sharing knowledge, (parts of) interventions, and lessons learned with wave-1 organisations in developing and implementing iCBT services.

Table 1
Demographic characteristics of the organisations and iCBT services implemented in the MasterMind project.

Wave	Org. ID.	Region, country	iCBT service	Guidance modality[1]	Referral pathways[2]	Referrals[3] *n*	Reach[4] %	Org. size[5]	Funding[6]
1	1	Scotland, UK	Beating the Blues	Self-help	GP, SP	5,724	5.30	M	Public
1	2	Southern Denmark, DK	NoDep	Guided	S	259	0.72	S	Public
1	3	Amsterdam area, NL	MindDistrict, MoodBuster	Blended	GP, SP	355	3.31	L	Insured
1	4	Hospital group, GE	Get.On Training	Guided	S, O	1,405	0.26	L	Insured
1	5	Tromsø area, NO	MoodGym	Self-help	GP	191	5.46	M	Public
2	6	Basque Country, SP	Super@tuDepression	Guided	GP, SP	216	0.55	L	Public
2	7	Wales, UK	Beating the Blues	Self-help	GP	355	3.34	L	Public
2	8	Aragon, SP	Super@tuDepression	Guided	SP	129	3.00	M	Other
2	9	Badalona, SP	Super@tuDepression	Guided	GP	253	1.01	L	Other
2	10	Galicia, SP	Super@tuDepression	Guided	GP	110	0.11	L	Public
2	11	Piemonte, IT	iFightDepression	Guided	S, GP, SP	161	0.75	L	Other
2	12	Veneto, IT	iFightDepression	Guided	SP	150	0.17	S	Other
2	13	Anatolia, TR	Top Sende	Guided	S	120	1.42	S	Other
2	14	Harju, EE	iFightDepression	Guided	S	56	1.60	S	Insured

1) Guidance modality refers to a categorisation of the online and face-to-face human interaction in the iCBT service. S: self-help by which none or only technical and administrative support is provided. G: therapeutic guidance provided by a therapist online. B: blended in which face-to-face sessions are integrated with online sessions in one treatment protocol.

2) Main patient referral pathway to the iCBT service. GP: via General Practitioner offices; SP: via mental health specialist referral; S: self-referral; O: other, eg.. via health insurers.

3) Referrals concerns the total number of patients deemed eligible for the iCBT service and received an account to access the treatment. Eligibility was determined following local clinical guidelines and was based on clinical judgement and/or using a structured validated clinical questionnaire (eg. PHQ-9).

4) Reach is the proportion of eligible individuals in a given (estimated) catchment area and those actually involved in the service.

5) Indicator of the size of the mental healthcare organisation involved in the implementation based on an estimate of the annual revenues and number of employees. L: large organization (revenues > 50 mln. Eur., full time equivalent (FTE) staff positions > 500). M: medium-large organisation (revenues 10 – 50 mln. Eur., FTE < 500). S: small organisation (revenues < 2 mln. Eur., FTE < 200).

6) Indicator of the source of funding source of the iCBT service. Insured: service use is reimbursed by private health insurances. Public: service is reimbursed by the public health care system. Other: project-based, out of pocket expenses, other sources or a combination of these.

For the current analysis, a pragmatic mixed methods approach was applied combining two different data sets to describe and assess the concept of organisational implementation climate in mental health settings. A qualitative conceptualisation

workshop was used to gather data from implementers about characteristics of and practical tools for shaping a strong organisational implementation climate. A cross sectional survey data was used to quantify organisational implementation climate and explore correlations with scores of perceived iCBT service satisfaction and usability amongst mental health service providers. The qualitative conceptualisation workshop was held 4 months prior the survey which was administered at the end of the MasterMind study. The following is ordered chronologically.

[Table 1: Demographic characteristics of the organisations and iCBT services implemented in the MasterMind project.]

Conceptualisation workshop

A partial concept mapping approach [38] was used to identify, cluster and rank ideas for two separate themes: 1) characteristics of an organisational implementation climate specifically focused at fostering successful implementation of iCBT in routine practice, and 2) practical tools implementers use to create and facilitate such strong organisational implementation climates. A structured workshop format was used to collect the qualitative data. Implementers involved in coordinating or executing the implementation of the iCBT services in one of the MasterMind regions were invited to participate in the workshop. To balance richness with feasibility, maximally two implementers of each region were invited to participate in the workshop. As the participating organisations varied in experience in iCBT delivery, setting, organisational size, and sources of funding, we expected to be able include a diverse group of participants with various levels of seniority, medical expertise, and experience with implementing iCBT. Implementers were excluded from participation when they filled-out the demographic questionnaire of the survey at the start of the MasterMind project. The workshop was structured into four separate steps for each theme to ensure a participatory conceptualisation process [38]:

1. Generate ideas: all participants individually wrote down as much as possible initial ideas in 15 minutes. This “silent groups” format preserves individuality but introduces a possible social facilitation effect from the presence of others.
2. Merge ideas: in group setting, the ideas generated were recorded in rotation, one idea per person on an electronic screen. The rotation procedure removes some of the anonymity of a “talk in any order” group while at the same time producing a list of ideas that are recorded without authorship.
3. Refine ideas: continuing in the group setting, the recorded ideas were clarified, discussed, combined, or refined as the group saw fit. One idea was discussed at a time and individuals were asked for reasons of agreement or disagreement and constructive suggestions for improvement. Combining and refining was done based on their perceived similarity and the revised ideas were recorded in a new list visible for the whole group.
4. Ranking: as a final step, each participant independently and silently rated the revised ideas in terms of its importance or usefulness to the theme.

The workshop was facilitated by members of the central MasterMind project evaluation team (CV, MM and AK) and designed to last maximal 4 hours divided in two main parts with a break in between. The workshop was conducted face-to-face during a MasterMind consortium meeting in October 2016.

Cross-sectional survey

The survey focussed on service delivery staffs’ perceived satisfaction with and usability of iCBT services and the organisational implementation climate they experienced in the organisation they worked for.

Satisfaction with the iCBT services was measured with the short version of the Client Satisfaction Questionnaire (CSQ) using a 4-point scale with three items [39]. It has good psychometric properties, and it has been tested in numerous studies on diverse samples of patients and professionals [40, 41]. Scale scores were calculated by summing item ratings. Usability was measured with the System Usability Scale (SUS) using a 5-point Likert scale to rate 10 items [42, 43]. It has good psychometric properties and is tested in numerous studies including samples of mental health professionals [42, 44, 45]. For calculating the SUS scale item’s score contribution ranged from 0 to 4. Negative worded items were converted to adhere to the same range order. Score contributions of each item was summed and multiplied with 2.5 [43].

A new questionnaire designed for the purpose of the current study was developed to measure organisational implementation culture. We defined organisational implementation climate as the shared meaning service deliverers attach to organizational

events, practices and procedures they experience and the behaviours they see being rewarded, supported, and expected in implementing evidence-based practices. Starting from this definition and existing literature on this topic, the central research team (CV, AK, MM, HR) deductively developed an initial pool of items. This initial list of items was improved and corroborated in two iterative review rounds by all principle investigators of the MasterMind consortium during the start-up phase of the MasterMind project, ie. prior to and apart from the qualitative workshop described above [10]. The resulting organisational implementation climate scale (ICS) consisted of 12 closed-item statements measuring 9 higher order constructs related to commitment, loyalty, support, recognition, appreciation, self-efficacy, relative priority, resources, and implementation strategies (see Fig. 2). The commitment construct was measured with two items assessing individual participants perception of their own and of their supervisors' commitment to the organisations' goals. Loyalty to the organisation was measured by one item addressing respondents' own allegiance to the organisation they work for. The extent to which respondents perceive to be incentivised by their organisation was assessed with three items asking the extent to which respondents felt being supported, recognised, and appreciated when implementing and using iCBT in daily service provision work. Aligned with Bandura's work [46], the construct of self-efficacy was measured with two items addressing respondents' confidence in their own abilities and enthusiasm in implementing and using iCBT service in practice. The perceived availability of resources for implementing iCBT in practice was measured by two items concerning the availability of qualified staff to provide the iCBT services, and the availability of other resources such as time, training, computers, etc. The extent to which respondents regarded the implementation as deliberate and planned was measured by one item asking about the existence of an implementation strategy for implementing the iCBT service. All items were rated using a 5-point Likert answering scale ranging from 'strongly agree' to 'strongly disagree'. Respondents could rate an item as 'not applicable' when the item was perceived to be irrelevant to their situation or organisation. Scale scores were calculated by taking the sum of all item scores.

[Figure 2: Schematic overview of the conceptualisation of the organisational implementation climate scale applied.]

Mental health service delivers involved in the provision or referral of patients to the iCBT services that were implemented in the MasterMind project, such as licenced psychotherapists, psychiatrists, mental health nurses, and general practitioners, were invited by the local implementers to fill-out the survey. Depending on local circumstances, various recruitment strategies were applied including directed electronic mass mailings, selected individual mailings, informal communications, and open invitations through for example organisations' newsletters. Starting from January 2015 for wave-1 and October 2015 for wave-2 sites, service deliverers' demographics were collected the moment they enrolled into the MasterMind project. Satisfaction, usability (CSQ and SUS) and organisational implementation climate (ICS) data were collected in both wave 1 and wave 2 sites at the end of the study in December 2016. The survey was administered online and in local language (Danish, Dutch, English, Estonian, German, Italian, Norwegian, and Spanish) using existing translations. Survey items were translated by external translators and checked by the local investigators when no translations were available. Data was uploaded to the central MasterMind database using a standardised codebook. The survey items are included in Additional file 2.

Statistical analyses

For the workshop and after finishing the four-step conceptualisation process, ranking was achieved by averaging the individual votes for each theme. Survey data was cleaned using descriptive statistics assessing distributions, centrality, outliers and missing values. Scale scores for SUS and CSQ were calculated following the respective prescribed scoring systems (CSQ: summed item rating scores. SUS: summed item ratings converted to a 0-100 scale). The curved grading scale by Sauro et al. [47] was used for qualifying the SUS scores, ie. a score of 68 was considered as the centre of the scale and thus as 'average' in comparison to norm data. For the organisational Implementation Climate Scale (ICS), the summed item-ratings was used as a total score where higher scores indicate organisational implementation climates that are conducive to better implementation processes and achieving better implementation outcomes. Cronbach's alphas were calculated as a measure for internal consistency of the scales. We considered $0.70 < \alpha < 0.90$ as indicative of a good internal consistency [48]. Differences in demographics and scale scores due to experiences with implementing and delivering iCBT services between Wave-1 and 2 service delivery organisations were analysed using the Wilcoxon rank sum test with continuity correction. The non-parametric Wilcoxon rank sum test was used because of the 4 and 5-point scales used for which the data cannot be assumed to follow a normal distribution. A .95 confidence interval (CI) was used to determine a significant difference. We calculated Spearman's rank-

order correlation coefficient (r_s) to explore the strength and direction of correlation between ICS and SUS and between ICS and CSQ respectively. We applied the following strength indicators for the correlations: $0 \leq r_s < 0.3$ is weak, $0.3 \leq r_s < 0.5$ is moderate, and $r_s \geq 0.5$ is strong [49]. Data cleaning and statistical analysis was carried out in R [50] using RStudio [51] using packages psych [52], ggplot2 [53] and sjPlot [54].

Ethics

Participants needed to provide informed consent prior to taking part in the study and could withdraw from the study at any time without explanation. Ethical approval for conducting this study in each setting was obtained in conformity with existing local clinical guidelines and local legislation. All local ethical review bodies approved the implementation study exempting it from further medical ethical review [10].

Results

Conceptualisation workshop

In total 16 implementers representing 14 service delivery organisations involved in the MasterMind project participated in the workshop. Table 2 provides an overview of the demographic characteristics of the participants. Implementers were middle aged (M = 39.3 years, SD = 10.9) with a clinical mental health background (n = 7, 44%) and 5–10 years of experience in the field of mental health (n = 5, 31%). Seven (44%) implementers had previous experience with iCBT services and 6 (38%) had a managing role in the organisation.

Table 2
Demographics of the conceptualisation workshop participants.

Variable	Pooled	Wave 1	Wave 2
Sample, *n* (%)	16 (100)	8 (50)	8 (50)
Age in years, *M* (SD)	39.3 (10.9)	41.5 (12)	37 (10.1)
Min. – max.	26–61	29–61	26–59
Gender, *n* (%)			
Female	8 (50)	5 (62)	3 (38)
Profession, *n* (%)			
MH professional[1]	7 (44)	4 (50)	3 (38)
Service dev., proj. mgr.[2]	4 (25)	1 (12)	3 (38)
Director, leadership	3 (19)	1 (12)	2 (25)
Consultant, advisor	2 (12)	2 (25)	0 (0)
Managing role, *n* (%)			
Yes	6 (38)	3 (38)	3 (38)
Field experience, *n* (%)			
< 3 years	3 (19)	0 (0)	3 (38)
3–5 years	4 (25)	3 (38)	1 (12)
6–10 years	5 (31)	3 (38)	2 (25)
> 10 years	4 (25)	2 (25)	2 (25)
Experience with iCBT, *n* (%)			
Yes	7 (44)	6 (75)	1 (12)

1) MH professional means mental health professionals such as psychiatrist, psychologist, mental health nurse, etc.

2) Service dev., proj. mgr. means roles of service developer or project manager.

[Table 2: Demographics of the conceptualisation workshop participants.]

Theme 1: characteristics of an organisational implementation climate fostering successful implementation of iCBT in routine practice.

A total of 55 items were generated for theme one identifying characteristics of a positive organisational implementation climate in the first individual silent brainstorming round. In the second and third round, the 55 items were merged, refined and conceptualised in 9 clusters in a structured group discussion. In the fourth round, the clusters were ranked by each participant individually. The results of the workshop including generated ideas, clusters and ranking outcomes are included in Additional file 1. Implementers participating in the workshop indicated that a strong organisational implementation climate encompasses the following 9 clusters (ranked in order of importance, from high to low):

1. Implementers should be in the position and role that fits with their capabilities and skills.
2. Implementation targets should be practical and feasible within realistic time frames.
3. A competent collaborative implementation team should be appointed with clear roles and responsibilities. In selecting team members, experience and ambitions should be balanced and team members should have a shared interest and beliefs in the implementation goals. An implementation leader should be embedded in the implementation.

4. Appropriate resources and incentives, such as supportive learning environment, time, technical support, and leadership support, as well as relevant policies and legal frameworks should be available and accessible.
5. The implementation object, here the iCBT services, should be aligned with the core goals of the organisation. The impact of implementing iCBT in relation to patients' needs, case load and bureaucracy related to mental health service delivery, should be clear to all involved and affected by the implementation.
6. Implementation processes and related decision making should be transparent and open to critical voices. This implies that the objectives, expectations and outcomes of implementing the iCBT services should be clear as well as mutual understanding of the benefits and of the barriers to implementing iCBT.
7. Information and knowledge about clinical outcomes and satisfaction with iCBT are accessible and shared amongst the implementation team members and with those affected by the implementation (eg. mental health professionals, referrers).
8. A reasonable number of stakeholders and external iCBT champions should be involved actively in the implementation to ensure alignment with (external) needs as well as to learn from others.
9. Lastly, attitudes of perseverance, fluency, friendliness, and 'do what you preach' are required, as well as flexibility in accepting failures and sympathy that things can go wrong.

Theme 2: practical tools to create and facilitate a positive organisational implementation climate.

The second theme addressed practical tools implementers can use to create and facilitate an organisational implementation climate that improves implementation outcomes. For this theme 29 items were generated by the workshop participants individually and in silence. In a structured group discussion (second and third step of the conceptualisation workshop), the items were refined and merged in 10 clusters. In the last step, participants ranked the clusters individually. The ideas, clusters and ranking outcomes are included in Additional file 1. The following 10 clusters of practical tools were identified (ranked in order of importance, from high to low):

1. Regular and structured feedback about job performance and related iCBT service outcomes be used to prospectively refine and improve implementation strategies and activities.
2. Structured monitoring of progress towards milestone and deliverables using indicators such as acceptance can be used to manage performance and outcomes of the implementation work.
3. Guidelines and methods for impact assessment of iCBT and implementation activities can help in improving the quality of information about the services in practice and implementation work.
4. In addition to piloting and testing the iCBT services, in-depth situational analyses and needs-assessments should be done structurally before engaging in new implementation work.
5. Continuous staff development, training and peer-coaching by/of implementers and mental health professionals involved in the implementation work can facilitate knowledge exchange.
6. Accessible infrastructure encompassing participatory mechanisms to involve stakeholders, adequate, accessible and reliable equipment, technical support, data collection and analytical tools should be made available to implementers.
7. Successes and achievements should be celebrated to encourage implementation team members through for example team activities, and inspiring (internal) communications.
8. Having a clear plan and the means to communicate internally and with key external stakeholders to ensure acceptance and where necessary collaboration on key implementation work. The plan should identify the main messages, target audiences, channels, and should enable open discussion about rationales, directions and progress of the implementation work.
9. To enhance motivation implementation team members, transparent and fair payment and incentive structures should be in place.
10. Acceptance of implementation activities and goals by those involved can be achieved through careful and transparent planning, transparent decision making, concrete end-points, time schedules, milestones, and stakeholder involvement.

Cross-sectional survey: demographics, satisfaction, usability and organisational implementation climate

Data collected in 11 of the 14 regionally operating mental health service providing organisations was of sufficient quality and completeness to be pooled for the current study. Three organisations were exposed to considerable participant drop-out due to staff turnover during the data collection period and therefore excluded from the analysis. Table 3 includes the demographic data extended with two items regarding the perceived state of change and efficiency gains in delivering iCBT services. In total 111 respondents provided both demographic and data on satisfaction, usability and organisational implementation climate (44:57 wave 1 to wave 2 ratio). Most participants were female (73%), psychologists (45%, in training or licensed) or general practitioners (GP, 28%) with more than 10 years of experience in the field of mental health care. Wave 2 sample consisted of significantly more GPs participating than in the wave-1 sample ($W = 2002.5$; 95% CI = 1.00, 2.00; $p < 0.01$). Also, wave-2 participants were significantly more experienced in their field than wave-1 participants ($W = 1080.5$; 95% CI = -1.00, 0.00; $p = 0.02$). Most respondents across both waves had limited experience with delivering iCBT (58% used iCBT with patients less than 4 times). However, wave-1 participants had significantly higher levels of iCBT delivery experience than wave-2 participants ($W = 1739.5$; 95% CI = 0.00, 1.00; $p = 0.01$). Most respondents received iCBT specific training and the two groups did not differ in their response ($W = 1601$; 95% CI = 0.00, 0.00; $p = 0.24$). When asked about their perceived state of change in using iCBT, a third indicated to perceive delivering iCBT services as a normal practice, and one third was trialling delivering the service. The rest was in the phase of orienting and gaining insight prior to deciding starting to provide iCBT services. A difference was found between the two waves where significantly more wave-2 respondents were in the phase of gaining insight and trialling its use than wave-1 participants ($W = 1618$; 95% CI = 0.00, 1.00; $p = 0.014$). When providing iCBT services, most respondents perceived efficiency gains in mental health care (41%) and the two groups did not differ significantly in their responses ($W = 1102.5$; 95% CI = -1.00, 0.00; $p = 0.379$) for this item. The fact that wave-2 differed significantly from wave-1 participants in their experience in iCBT delivery and their state of change aligns with what expected differences between organisations with more experience in implementing iCBT services (wave-1) and those with less experience (wave-2).

Table 3
Extended demographics of delivery staff, pooled and per implementation wave.

Variable	Pooled	Wave 1	Wave 2
Sample, *n* (%)	111 (100)	48 (43)	63 (57)
Gender, *n* (%)			
Female	80 (73)	36 (77)	44 (70)
Profession, *n* (%)			
GP	31 (28)	0 (0)	31 (49)
Licenced psychologist	20 (18)	10 (21)	10 (16)
Psychologist in training	30 (27)	29 (62)	1 (2)
Psychiatrist	6 (5)	1 (2)	5 (8)
General mental health worker	6 (5)	1 (2)	5 (8)
Other	17 (15)	6 (13)	11 (17)
Experience in mental health care, *n* (%)			
< 3 years	18 (17)	7 (15)	11 (18)
3–5 years	18 (17)	12 (26)	6 (10)
6–10 years	23 (21)	15 (32)	8 (13)
> 10 years	49 (45)	13 (28)	36 (59)
Experience with iCBT, *n* (%)			
Provided a patient < 4 times iCBT	62 (58)	19 (42)	43 (69)
Provided a patient 5–10 times iCBT	11 (10)	8 (18)	3 (5)
Provided a patient 11–15 times iCBT	8 (8)	6 (13)	3 (5)
Provided a patient 16–20 times iCBT	4 (4)	0 (0)	4 (6)
Provided a patient > 20 times iCBT	21 (20)	12 (27)	9 (15)
Received iCBT training, *n* (%)			
Yes	82 (75)	38 (81)	44 (71)
If yes: type of iCBT training received, *n* (%)[1]			
Technical	34 (39)	6 (20)	28 (49)
Therapeutic	4 (5)	1 (3)	3 (5)
Both	47 (54)	23 (77)	24 (42)
Other	2 (2)	0 (0)	2 (4)
State of change in delivering iCBT, *n* (%)[2]			
Orienting	8 (8)	4 (8)	4 (8)
Gained some insight	22 (22)	8 (17)	14 (26)
Decided to change	4 (4)	2 (4)	2 (4)
Trialling usage	34 (34)	10 (21)	24 (45)

Variable	Pooled	Wave 1	Wave 2
It is normal	33 (33)	24 (50)	9 (17)
Perceive an efficiency gain through delivering iCBT, *n* (%)[3]			
Strongly disagree	3 (3)	1 (2)	2 (4)
Disagree	13 (13)	8 (19)	5 (9)
Disagree nor agree	29 (29)	15 (35)	14 (25)
Agree	41 (41)	10 (23)	31 (54)
Strongly agree	14 (14)	9 (21)	5 (9)

1) missingness: 21.6% due to not all respondents received a training prior to filling out the demographics survey.

2) missingness: 9%.

3) missingness: 10%.

[Table 3: Extended demographics of delivery staff, pooled and per implementation wave.]

Scale scores and item ratings

Respondents regarded the usability of iCBT services as slightly below average (M_{SUS} = 63.76; SD = 15.53) and satisfactory (M_{CSQ} = 9.11; SD = 1.96). Similarly, organisational implementation climate was also rated slightly above the midpoint of the scale with a totalled Mean scale score of 43.21 (SD = 5.62). Table 4 provides the item and scale statistics for each measure. Item scores are included in Additional file 2. All measures had good internal consistency (α_{SUS} = 0.83; α_{CSQ} = 0.82; α_{ICS} = 0.76). Wave-2 respondents scored significantly different on the SUS scale (W = 1919.5; 95% CI = 7.50, 17.50; $p < 0.05$), but not on the CSQ (W = 1569.5; 95% CI = 0.00, 1.00; $p = 0.42$) and the ICS scales (W = 907.5; 95% CI = -3.00, 2.00; $p = 0.52$). The Boxplot in Fig. 3a also indicates that respondents agree in their perceived usability (SUS) of iCBT services, and the organisational implementation climate (ICS) they operate in. However, responses on the CSQ scale are more dispersed which is indicative of less agreement about perceived satisfaction in delivering the iCBT services. As indicated in Fig. 3b, organisational implementation climate was weakly associated with variation in the system usability scale (r_s = 0.25; $p = .03$), and moderately correlated with the client satisfaction scale (r_s = .51; $p \leq .00$).

Table 4
Item and scale scores of perceived usability (SUS-10) and satisfaction (CSQ-3) with iCBT services and organisational implementation climate (ICS-12) by professionals at post study.

Measure[1]	Item[2]					Scale[3]					
Wave	*n*	Mean (SD)	Median	Min	Max	*n*	Mean (SD)	Median	Min	Max	Alpha[4]
SUS-10	111	3.04 (0.29)	3.00	2.14	3.80	103	63.76 (15.53)	67.50	27.50	90.00	0.83
Wave 1	48	2.99 (0.20)	3.00	2.70	3.60	48	70.26 (10.82)	72.50	42.50	90.00	0.76
Wave 2	63	3.08 (0.34)	3.10	2.14	3.80	55	58.09 (16.84)	57.50	27.50	90.00	0.84
CSQ-3	111	3.02 (0.66)	3.00	1.00	4.00	108	9.11 (1.96)	9.00	3.00	12.00	0.82
Wave 1	48	3.13 (0.51)	3.00	2.00	4.00	48	9.40 (1.54)	9.00	6.00	12.00	0.65
Wave 2	63	2.93 (0.75)	3.00	1.00	4.00	60	8.88 (2.23)	9.00	3.00	12.00	0.89
ICS-12	111	3.62 (0.46)	3.58	2.50	4.92	89	43.21 (5.62)	43.00	30.00	59.00	0.76
Wave 1	48	3.57 (0.46)	3.54	2.75	4.92	47	42.96 (5.50)	43.00	33.00	59.00	0.76
Wave 2	63	3.66 (0.47)	3.70	2.50	4.75	42	43.50 (5.81)	43.00	30.00	54.00	0.77

1) SUS (10 items) applied a 5-point Likert scale with 1 = strongly disagree to 5 = strongly agree. Negative SUS items were rescored to align with positive worded items. CSQ (3 items) applied a 4-point scale with differing response options indicating agreement with statements. ICS (12 items) applied a 5-point Likert scale with 1 = strongly disagree to 5 = strongly agree.

2) Item statistics using raw item ratings. All cases with more than one item rated were included.

3) Scale statistics using summed item rating scores. For SUS-10, the summed item ratings were converted to a 0-100 scale following Brook (1996). Only complete cases were included.

4) Standardised Cronbach's alpha based using correlation matrix.

[Table 4: Item and scale scores of perceived usability (SUS-10) and satisfaction (CSQ-3) with iCBT services and organisational implementation climate (ICS-12) by professionals at post study.]

[Figure 3: (a) Boxplot indicating the quartiles and item response distribution of the SUS, CSQ and ICS scales. (b) Scatter plot indicating the distribution of item responses and illustrating degree of correlation of responses for SUS and CSQ items with ICS. Blue and red dots represent SUS and CSQ data points respectively. The blue and red lines represent the linear regression models between respectively SUS and ICS, and CSQ and ICS. The shaded area indicates the confidence level interval of 95% around the regression lines.]

Discussion

In this study, a mixed methods approach was used combining a qualitative concept mapping workshop with cross-sectional survey data to advance the understanding of organisational implementation climate in implementing iCBT services in mental health care settings. This combination of empirical methods was used to obtain a qualitative understanding of how implementers characterise organisational implementation climate and substantiate this with a quantitative exploration amongst mental health service deliverers in an organisational context in which real implementation took place.

The top-3 ranked characteristics of a strong organisational implementation climate conducive of improving implementation outcomes, include: (1) clarity on role and skills of implementers, (2) feasibility of implementation targets, and (3) instigating a dedicated implementation team. Furthermore, various practical tools can be used to build a strong organisational implementation climate through (1) regular and structured job performance feedback, (2) structurally monitoring progress, and (3) guidelines and methods for impact assessment. These main findings from the concept mapping workshop are aligned with Klein and Sorra's integrative model of determinants of the effectiveness of organisational implementation [24]. In their model, implementation effectiveness is in part a function of the strength of an organisation's climate for implementation which

comprises a set of organisational policies and practices. According to this theory, different organisational policies and practices may be equifinal in their outcome, skills and motivation play an important role in achieving sustained use of the innovation as unskilled, unmotivated are unlikely to use the innovation at all [24]. This aligns with what implementers ranked high in the workshop regarding roles, capabilities and skills of implementers, implementation targets, and the competences of the implementation team as a whole. Similarly, these findings are aligned with the Normalisation Process Theory (NPT) which takes a sociological perspective in theorizing the way people act and interact in integrating and embedding new ways of working in existing practices [55]. For example, the importance of skill sets in organising collective action, corresponds with the finding that for implementers to be effective, they need to have the position and role in the implementation work and team that fits their capabilities and skills. In addition, having realistic implementation time frames, and practical and feasible targets can influence how the new intervention is used in practice. This corresponds to NPT's notion of interactional workability as a factor shaping collective action through operationalization of the innovation into practical ways of working that fit the local context. Furthermore, the finding that members of an implementation team should have a shared interest and beliefs in the implementation goals, corresponds to the theory's notion of coherence referring to processes of individually and collectively determining the innovation's practical meaning and utility.

Turning to the cross-sectional survey, mental health service delivers generally are satisfied with iCBT (M_{CSQ} = 9.11, SD = 1.96) and regard usability of the iCBT services as slightly below average (M_{SUS} = 63.76, SD = 15.53). Furthermore, the participating mental health service deliverers regarded the organisational implementation climate they operate in as supportive to implementing the iCBT services (M_{ICS} = 43.21, SD = 5.62). These acceptability scores are slightly more positive than existing literature on clinicians' perspectives toward delivering Internet-based psychotherapies. In a German survey comparing acceptance of web-based psychotherapy, it was found that clinicians scored around the summed midpoint of the scale (total score = 45.18, scale range = 16–80, n = 428) indicating a more neutral stance [56]. Another study found an overall a neutral stand point (M = 3.45, SD 0.72, 5-point Likert scale with 3 as neutral score, n = 95) on a survey designed to contrast perceived advantages and disadvantages of Internet-based therapies among Austrian psychotherapists [57]. A third study reported similar score patterns of perceptions of computer-based psychological treatments (M = -0.05, SD = 0.79, 5-point Likert scale with 0 as neutral score, n = 26) [58]. This difference in perceived acceptance of Internet-based psychotherapies might be explained by that the majority of the service delivers (82%) involved in the MasterMind project received iCBT training prior to filling out the survey whereas 80% of the participants in the Schröder study indicated to have no or limited prior knowledge of Internet-based interventions. This might indicate the samples were drawn from different groups of mental health service providers and the possible difference between intended use by non-experienced professionals and actual use by trained professionals. In addition, the difference in findings might be due varying study designs applied. In our study we choose to use more generic instruments (SUS and CSQ) whereas in the other studies applied questionnaires that were specifically developed for the studies' purposes.

A third finding in this study is that a stronger organisational implementation climate is (weak to moderate) associated with higher levels of satisfaction and usability of iCBT. Although causality is not proven by this study, this finding could lead to proposing that acceptability of iCBT services in terms of usability and satisfaction might vary as a function of organisational implementation climate. That is, stronger organisational implementation climates might support higher acceptance of iCBT services by mental health service providers. This is aligned with an earlier finding of Aarons and colleagues [25] concluding that organisational climate is associated with mental health service providers' attitudes towards deciding to adopt evidence-based practices in general. This American study amongst public sector professionals providing youth and family mental health services, showed that strong organisational cultures for implementing evidence-based practices was associated with positive attitudes of participants towards those practices. Similarly, a weak organisational implementation climate was associated with higher levels of perceived discrepancies between current and new ways of working, most notably when there are unclarities and conflicts about roles and responsibilities. Authors conclude that clear specification of deliverers' roles and actions can enhance implementation climates and subsequent contribute to implementation success. This finding also aligns with findings from our conceptualisation workshop, notably as ranked number 1 characteristic of a strong organisational implementation climate conducive of improving implementation outcomes.

When viewed in combination, the qualitative findings from the workshop on the characteristics of a strong organisational implementation climate conceptually align with and validate the survey measurement approach. Despite the pragmatic nature of

the survey, items of commitment, attitudes, and resources measured in service delivery staff conceptually align to implementers' notions of people and skills, the implementation team, availability of resources and attitudes. For example, attitudes as referring to the perceived self-esteem in using a new intervention found in the workshop, directly corresponds to a survey item about confidence in ones' own ability to implement. Similarly, the importance of resources supportive to the implementation work such as incentives, skilled people and champions, time, technology, technological support, and policies, qualitatively aligns to survey items addressing availability of qualified staff, adequate resources, and implementation strategies. In that respect, the findings of the workshop seen in light of the survey suggests that organisational implementation climate is not only an inherent property of the context in which implementation activities take place, it can also be intentionally shaped to enhance impact of those activities.

Strengths and limitations

Combining a qualitative conceptualisation workshop with implementers with a quantitative cross-sectional survey amongst mental health service delivers can be regarded as a strength of this study as it enables illustrating different aspects of organisational implementation from different viewpoints. This study contributed to a refined understanding of organisational implementation climate in mental health care settings from the viewpoint of implementers, as well as a quantified perception of organisational implementation climate amongst those who – are required to – actually deliver innovative iCBT services. By combing these different viewpoints in one study, a more complete picture of organisational implementation climate in relation to implementing iCBT services in mental health settings is provided.

However, the findings of this study should be interpreted with care for several reasons, including the inevitable heterogeneity in the settings in which the organisations implemented these iCBT services, and the representativeness of implementers and service deliverers in implementing and delivering the services. Regarding the implementation settings, service organisations not only varied in their position in the regional health care system (primary, secondary care), they also varied in their sources of funding for delivering mental health services (see Table 1) driven by underlying regional and national policy contexts. Although in general, most mental health service organisations in Europe are transitioning towards deinstitutionalised care [59], the organizations participated in the MasterMind project likely had differing objectives in implementing the (self-selected) iCBT service. In relation to that, it must be noted that solely taking part in the MasterMind project and receive (complementary) European funding for implementing and evaluating iCBT services, might have impacted decision making on implementation activities and their respective outcomes. Furthermore, the implementers at the organisations recruited the respondents for the survey which might have led to a biased sample of service deliverers who had an interest in innovation and international collaborations in the field of mental health.

In addition, other methodological strengths and limitations of the concept mapping workshop and survey need to be considered. The workshop by which the brainstorming and ranking was achieved, was highly structured. Participants received instructions in advance of the meeting, a combination of pen-and-paper and digital recording methods were used, as well as individual silent idea generation and rankings and structured one-by-one group clarification discussions were used to prevent production blocking [60]. The workshop was held in English. Because only two participants were native English speakers, cognitive inertia might have been induced pursuing participants to the same line of thinking and potentially leading to fear of being judged and pressured to remain within the scope of existing options. Although the workshop was designed to include silent individual and group work, this pressure might have influenced the performance of the group in generating a rich variety of ideas during the first two steps and ranking of ideas later on. A combination of offline and online methods involving both experienced implementers, researchers and service deliverers in for example a Delphi method could enrich the findings presented in this study. For the survey and as noted before, causality between acceptability and organisational implementation climate cannot be inferred from the current study. We merely explored if providers' acceptability of iCBT services in terms of usability and satisfaction, empirically varied with perceived organisational implementation climate. Further experimental research is required to test if organisational implementation climate moderates perceived service satisfaction and usability and what practical tools are most effective in increasing acceptance and uptake of iCBT services. In addition, reliability, accuracy and applicability of the ICS scale might be limited due to the pragmatic nature of item development and selection process.

Future research

In this study, a notion of the value and nature of organisational implementation climate in implementing iCBT services in routine mental health care has been explored. To further this line of research, open phenomenological research is required focussing on further theorising the mechanisms by which organisational implementation climates exerts change in implementing Internet-based psychotherapy in mental health settings. Subsequently, controlled implementation interventionist research can empirically confirm the theoretical assumptions and improve our understanding of the complex interactions between the iCBT, implementers, service deliverers and the organisational context they operate in. In this respect, one important research question could be concerned with how and to which extend organisational implementation climates can be used as an active implementation strategy for it to effectively improve implementation outcomes.

Conclusions

This study aimed to advance the understanding of the nature and value organisational implementation climate in implementing iCBT services in routine mental health care settings. From the perspective of implementers, a strong organisational implementation climate includes (1) clarity on skills and roles of implementers, (2) feasibility of implementation targets, and (3) instigating a dedicated implementation team. The top-three tools that can be used to create a strong implementation climate include: (1) job performance feedback, (2) monitoring in progress in achieving implementation targets, and (3) providing guidelines and protocols for structured impact assessment. From the perspective of mental health service deliverers, the organisational implementation climates they operated in was perceived as supportive to implementing the iCBT services. Explorative analysis revealed that organisational implementation climate was weakly associated with usability and moderately with satisfaction scores. The qualitative findings from the concept mapping workshop conceptually align with the quantitative approach applied in this study for measuring organisational implementation climate. This suggests that organisational implementation climate is not only an inherent characteristic of the context in which implementation takes place, it might also be shaped to improve the impact of those activities in implementing iCBT services in routine care settings. Future research should further theorise organisational implementation and empirically test associations between organisational implementation climate, implementers and service deliverers.

Abbreviations

CFIR Consolidated Framework for Implementation Research

CSQ Client Satisfaction Questionnaire

GP General Practitioner

iCBT Internet-based Cognitive Behaviour Therapy

ICS Implementation Climate Scale

MasterMind MAnagement of mental health diSorders Through advancEd technology and seRvices

– telehealth for the MIND

NPT Normalisation Process Theory

SUS System Usability Scale

Declarations

Ethics approval and consent to participate

Ethical approval for conducting this study in each setting was obtained in conformity with existing local clinical guidelines and local legislation of the participating organisations. All local ethical review bodies approved the implementation study exempting it from further medical ethical review. See the published study protocol for more information [10].

Consent for publication

Not applicable.

Availability of data and materials

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

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

CV, JS and HR originated the idea for conducting this particular study. CV, MM, AK and HR designed the study protocol. CV, MM and AK collected the data. The analysis was performed by CV. CV lead on authoring the manuscript under supervision of TF, AK and HR. All authors provided feedback and suggestions for this manuscript and read and approved the final manuscript.

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Figures

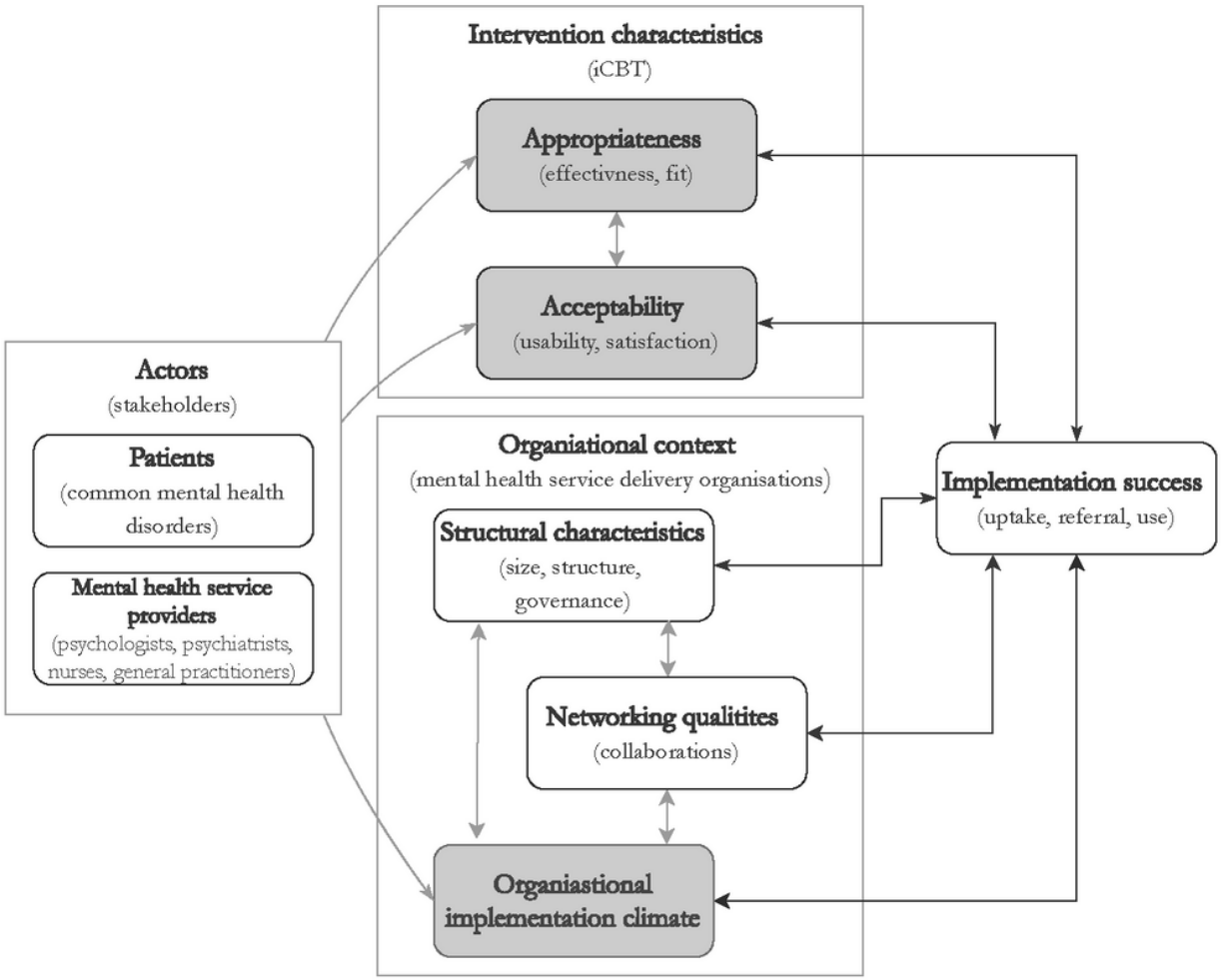

Figure 1

Conceptual model of implementation success, intervention characteristics and wider organisational context. The relation between organisational implementation climate and acceptability of iCBT services that were implemented, was the subject of this explorative study.

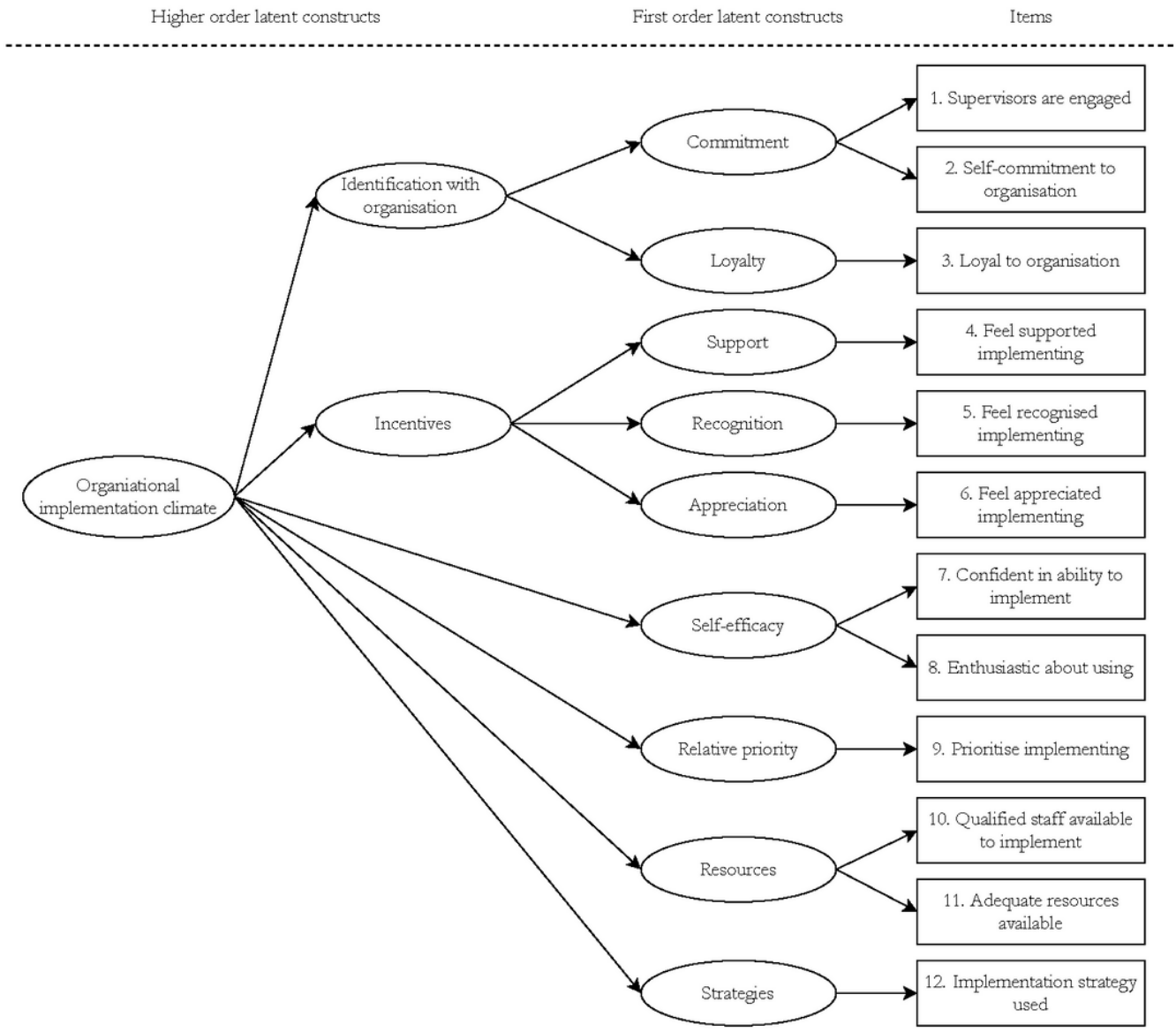

Figure 2

Schematic overview of the conceptualisation of the organisational implementation climate scale applied.

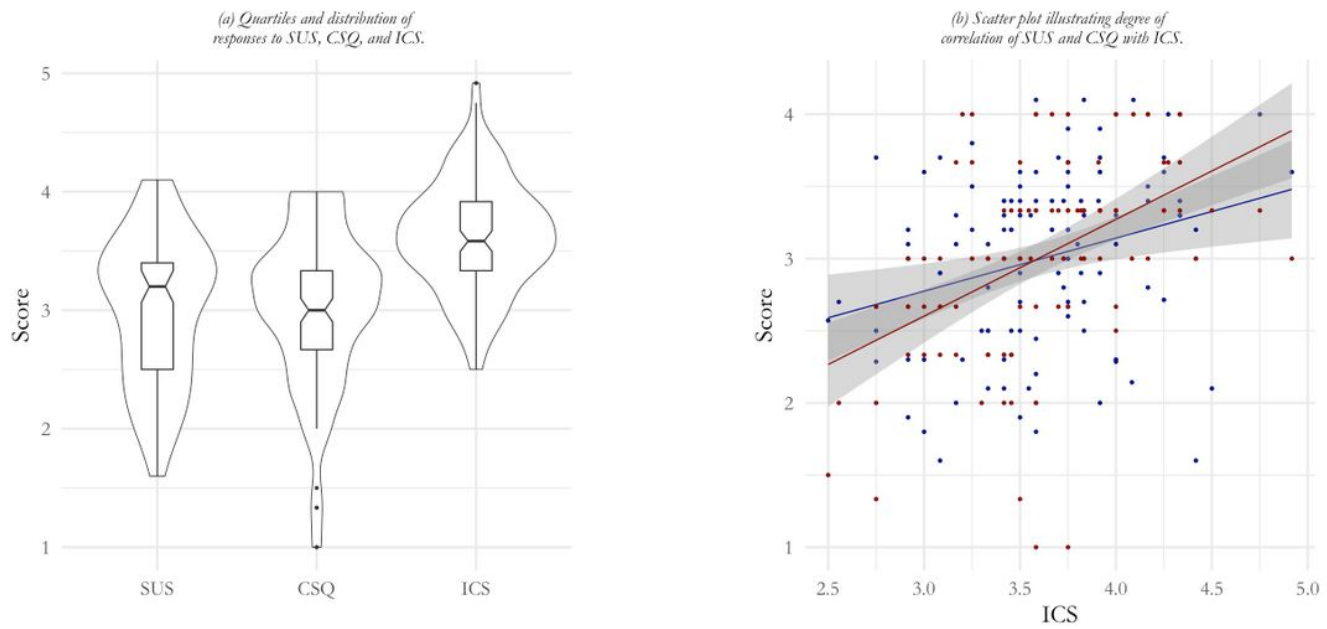

Figure 3

(a) Boxplot indicating the quartiles and item response distribution of the SUS, CSQ and ICS scales. (b) Scatter plot indicating the distribution of item responses and illustrating degree of correlation of responses for SUS and CSQ items with ICS. Blue and red dots represent SUS and CSQ data points respectively. The blue and red lines represent the linear regression models between respectively SUS and ICS, and CSQ and ICS. The shaded area indicates the confidence level interval of 95% around the regression lines.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Additionalfile2Surveyitemsandresults.docx
- Additionalfile1Resultsbrainstorm.docx