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FACILITATORS AND BARRIERS OF INTERNET-DELIVERED COGNITIVE BEHAVIOURAL THERAPY (iCBT) IMPLEMENTATION IN ESTONIA.

Master Thesis

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VEEBIPÕHISE KOGNITIIVSE KÄITUMISTERAAPIA RAKENDAMIST VÕIMALDAVAD TEGURID JA RAKENDAMISE TAKISTUSED EESTIS

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Author’s declaration of originality

I hereby certify that I am the sole author of this thesis and this thesis has not been presented for examination or submitted for defence anywhere else. All used materials, references to the literature and work of others have been cited.

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Abstract

The discrepancy in the opinions of mental healthcare professionals towards of online psychotherapy, otherwise known as internet-based or computerised cognitive behaviour therapy (iCBT or cCBT), has been a major challenge in its implementation despite its proven clinical effectiveness and potentials to increase access to care and reduce costs. The whole study centres on the evaluation of the boosting factors (facilitators) and barriers that impede iCBT implementation, considering the perceptions of the health care professionals.

Prior to this study, many barriers had been demonstrated to defeat iCBT implementation, and to other factors considered as enablers. However, despite the availability, awareness and other benefits iCBT programs has to offer, therapists are still finding it hard to implement iCBT as a routine practice to be used for depression care. This study confirmed problems, such as lack of patient adherence, the sceptical attitude of therapists, roles of comorbidities, etc have the potentials to delay iCBT implementation; and promoting factors including financial motivation, adequate iCBT training, patient eligibility and willingness to use iCBT, were percieved as enablers for to promote its full implementation.

The methodology used was strictly qualitative and was in conformity with MAST Method – a standard evaluation method for several EU telemedicine research projects. The unstructured qualitative data were collected through interviews; audio-recorded and later analysed into themes— patient profiles, healthcare professionals profile, satisfaction and usability, hindering and facilitating factors for iCBT. The results around these themes were pooled from the 17 participated Estonian healthcare professionals'perceptions, and all factors highlighted were considered to have an influence as well as forming a basis for iCBT implementation.

Lastly, this thesis is in English language and contains 34 pages of text, 9 chapters and 5 tables.

Annotatsioon

Veebipõhise kognitiivse käitumisteraapia (vKKT) rakendamist võimaldavad tegurid ja rakendamise takistused Eestis.

Hoolimata veebipõhise kognitiivse käitumisteraapia (vKKT) tõestatud kliinilisest tõhususest ja potentsiaalist suurendada abi kättesaadavust ning vähendada tervishoiu kulusid, on selle meetodi rakendamise suurimaks takistuseks olnud vaimse tervisetervishoiu töötajate lahkarvamused vKKT suhtes. Käesolev magistritöö keskendub vKKT kasutuselevõttu soodustavatele ning pärssivatele teguritele Eesti tervishoiutöötajate vaatepunktist.

Mitmed eelnevalt teostatud teadustööd on demonstreerinud tegureid, mis vKKT juurutamist takistavad või soodustavad. Hoolimata vKKT programmi hüvedest, on terapeutidel keeruline seda meetodit depressiooniravi rutiinses praktikas rakendada. Patsientide kasutajapüsivuse puudumine, terapeutide skeptiline hoiak ja kaashaigestumine on osa vKKT kasutuselevõttu pärssivatest probleemidest, mida kinnitas ka käesoleva magistritöö raames teostatud uuring. vKKT täielikku rakendamist soodustavad mõjurid on antud uuringu kohaselt rahaline motivatsioon, adekvaatne vKKT koolitus, patsientide vastavus ning tahe kasutada vKKT-d.

Käesoleva magistritöö uurimismeetod on kvalitatiivne, autor kasutasstandardse hindamissüsteemi MAST meetodit, mis on olnud kasutusel mitmete Euroopa Liidu telemeditsiiniuuringute teostamisel. Hääl-salvestatud intervjuudest seitseteist Eesti tervishoiutöötajatega koguti korrastamata kvalitatiivsed andmed, mis hiljem analüüsiti ning alateemadeks jaotati: patsientide profiilid, tervishoiutöötajate profiilid, rahulolu ja kasutatavus, vKKT-d pärssivad ja soodustavad mõjurid. Autor jõudis järeldusele, et kõik uuringus tõstatatud alateemad avaldavad vKKT juurutamisele märkimisväärset mõju

Lõpetuseks, käesolev magistritöö on kirjutatud inglise keeles, koosneb 34-st leheküljest tekstist, mis sisaldavad ühkesat peatükki ning viit tabelit.

List of Abbreviations and terms

cCBT	Computerised-delivered cognitive behavioural therapy
CI	Confidence Interval
EU	European Union
GP	General Practitioners
HCP	Healthcare professionals
HIPPA	Health Insurance Portability and Accountability Act
IBP	Internet-based psychotherapy
iCBT	Internet-delivered cognitive behavioural therapy
MAST	Model for ASsessment of Telemedicine applications
MasterMind	MasterMind **(Ma**nagement of mental health di**s**orders **t**hrough advanc**e**d technology and se**r**vices– telehealth for the **MIND**)
MDH	Minnesota Department of Health
PREDI-NU	**Pre**venting **D**epression and **I**mproving Awareness through **N**etworking in the European **U**nion
vKKT	Veebipõhise kognitiivse käitumisteraapia

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1. Introduction

The history of internet-delivered psychological treatments could be traced to its first trial which was carried out as far as late 1990s [2]. After that, tens of programs and trials have been conducted for a number of somatic and psychiatric conditions where internet-delivered Cognitive Behaviour Therapy (iCBT) have been greatly deployed [25].

Titov *et al*. had proven the effectiveness of iCBT programs that were guided by therapists via encrypted e-mail than over unguided programs with a few exceptions [65]. The iCBT programs are text-based otherwise known as online bibliotherapy and could comprise of audio files, (streamed) video clips, up to 20 modules or more in some resources — similar to face-to-face therapy session [40]. Additionally, therapist guidance is less required but more priority is rather given to home exercises (10-15 minutes weekly) and feedbacks. However, some programs, including the Dutch "Interapy" iCBT requires more therapist involvement through text exchange between the clients and therapists [2]. In comparison, some iCBT programs are real-time chat-based and thus saves no time for therapists [35].

During iCBT, patients log-in regularly to a secure website platform for some specified period to access, learn and perhaps download online materials pertinent to their treatment, which are arranged into a diverse series of lessons or modules [40]. The same platform contains homework exercises which are expected to be completed before taking the next module, thus the next tailored modules become available. Progress reports come in form of relevant computerised questionnaires assembled with the iCBT programs which are filled by patients periodically, thus enabling the therapists to track patients' progress, including outcomes and safety [31].

Regarding the content and length, programs could have little or no difference to face-to-face treatments [60]. Most iCBT programs for depression could contain similar modules as manualized CBTs and can take 10 weeks before completion. To add, contents could contain home-exercises, psychoeducation, restructuring of cognition, prevention of relapse and behavioural activation [31].

Although iCBT has promised and proven in many randomised controlled research trials to increase efficiency and access, solving the problem of stigmatisation and shyness as well as being cost-effective [11]. However, low uptake rates are associated with therapist less

enthusiasm, which could be due to less knowledge about the program and benefit accrued; vision impaired patients, lower level education patient and low IT [73].

Most iCBT software packages are interactive and comprise of exercises, texts, quizzes and videos [63]. In adults, cCBT has been proven effective against many emotional disorders such as anxiety and depression [41], [43], panic disorder [10], agoraphobia [36], obsessive-compulsive disorder [33], [45] and post-traumatic stress disorder [42]. Essentially, cCBT is now recommended by the National Institute for Health and Clinical Excellence has endorsed iCBT for the treatment anxiety and depression (mild to moderate) in adults [52].

1.1 The aim of the research

The aim of this study is to explore both the facilitators and barriers of internet-delivered cognitive behavioural therapy implementation. The objectives include:

1. To assess the perceptions of healthcare professionals on factors that could facilitates iCBT implementation as well as barriers confronting its deployment as a routine practice.
2. To identify the effects of both patient and healthcare profiles on iCBT implementation.
3. To ascertain the impacts of usability and satisfaction of the iCBT service.

1.2 Hypothesis

iCBT is a modern digital intervention that has been proven effective against mental illnesses, such as, depression and anxiety. Many research works had claimed its positive impacts and potential reliance to boost patient access to care, efficiency and cost-effectiveness. However, despite the availability, awareness and other benefits iCBT programs has to offer, therapists are still finding it hard to implement iCBT as a routine practice to be used for depression care. Therefore, this study is designed to shed light on these barriers and suggest pertinent facilitators required for the implementation of iCBT service, which is also helpful even in primary care.

2.0 iCBT— psychotherapy method of the digital era

2.1. iCBT vs Traditional CBT

Cognitive behavioural therapy (CBT) is one of the mental therapy approaches against mood disorder including anxiety disorder and health condition such as insomnia treatment [2]. CBT is well known for face-to-face therapy procedures [65]. Unlike traditional CBT, iCBT is delivered via the internet, thus having a profound effect on CBT. Although there were several emerging questions on effective delivery of iCBT: iCBT has been proven effective in the primary care for anxiety treatment [60]. Sholomskas *et al.* noted the CBT training for therapists as important factor [63] whereas Almov *et al.* in their research pointed out the insignificant effect therapists could contribute [1]. Nevertheless, there is no significance difference between the iCBT programs guided by psychologists or technicians since less professional skills are required by psychologists as compared to face-to-face procedures [65]. Table 1 showed a forest plot displaying effect sizes of studies comparing guided internet-based treatment with face-to-face treatment.

Although there were problems regarding the tailoring of treatment plan after a case has been conceptualised and this was quite difficult with traditional CBT [4]. Internet-delivered CBT program, however, has made it possible to tailor a treatment plan in accordance with patient preference and also capable of dealing with overlapping comorbid conditions such as anxiety and depression [5]. Therefore, internet-delivered CBT has drifted therapist from manual systems and increase therapist adherence to treatment procedures [72]. Additional, iCBT has increased access to care, flexibility and awareness of CBT but with potential risks of reducing the skills of the therapist [35]. The compliance of a remote patient with iCBT is arguable, especially when less support are given [3].

Table 1. Forest plot displaying effect sizes of studies comparing guided Internet-based treatment with face-to-face treatment [60].

Study	Weight	Std. Mean Difference (Random, 95%)
Andersson *et al*	2.8%	0.43 (-3.0, 1.15)
Andrew *et al*	3.4%	0.06(-0.61, 0.72)
Bergstrom *et al*	10.9%	0.00 (-0.37, 0.37)
Carlbring *et al*	4.7%	0.03 (-0.38, 0.44)
Gollings *et al*	3.8%	0.05 (-0.51, 0.61)
Hedman *et al*	11.9%	-0.26 (-0.88, 0.36)
Kaldo *et al*	4.9%	-0.40 (-0.58, 0.51)
Kiropoulus *et al*	8.2%	0.12 (-0.30, 0.54)
Paxton *et al*	7.5%	0.31 (-0.13, 0.76)
Schover *et al*	7.8%	-0.41 (-0.58, 0.29)
Spek *et al*	19.4%	0.07 (-0.21, 0.34)
Wagner *et al*	6.0%	0.01 (-0.49, 0.51)
Total (95% CI)	100.0%	-0.01 (-0.13, 0.12)

2.2 Categories of iCBT and its adoption by patients and therapists

There are loads of iCBT programs, some are app-based (such as MoodKit) whereas others are web-based (such as FearFighter) [22]. However, different iCBT programs could be tailored for the same or different illnesses.

Based on the service charge, iCBT programs could be commercial or free for use. However, the service cost has no effect on its effectiveness. For instance, iCBTs such as Beating the Blues, CBT Basic app needs to be paid for whereas MoodGym, Colour Your Life etc. can be used without charges. These free programmes are mostly developed either by research institutes or public sectors. Some iCBT programs bear the formal endorsements of government health services; some are affiliated with the clinical groups of hospital and academic sectors; some were used in clinical trials with published results; some were developed by consortia involving psychologists and psychiatrists. Table 3 showed 13 anxiety and anxiety-related iCBT websites and apps.

Based on the involvement of therapist-patient interaction, iCBT can be either real-time known as synchronous (e.g. video or messenger services, telephoning) or delayed otherwise asynchronous (such as, in email conversation). Also, some are designed to prevent the development of mental disorders whereas others are to treat mental disorders [65]. In the appendix was a table showing the meta-analysis of different iCBT programs with reference to their focus groups, limitations and recommendations.

2.3 Experiences on iCBT by patients and therapists

Rozental *et al.* posited that although iCBT has been proven in many randomised clinical trials to be effective [60], but they may not be suitable for all patients [71]. Thus many patients have different experiences as in relations towards its effectiveness and approach. Similarly, the perceptions of physicians could be similar or differ in diverse situations— whereby some support its implementation due to proven efficacy whereas others do not.

Interestingly, the connection in the attitudes of both therapists and patients regarding online treatment (Table 2) was explained in the study conducted by van der Vaart *et al.* while investigating the possibility to blend online modules into face-to-face therapy [71]. The actors perceived online sessions as positive and described the intervention to enhance the self-

management of patients. Other similarly agreed and related characteristics were — convenient access to the online platform, provision of a patient with more responsibility for his/ her own therapy, and incorporating the therapy more into the daily life of the patient. Van der Vaart *et al* further mentioned other practical benefits to include patient's ability to perform assignments at their own pace and time, transparency as well as the deduction of travel time [71]. Regarding patient-provider relationship, the result reflected online sessions have the possibility to weaken the patient-therapist interaction. However, major drawbacks for online therapy outlined were— lack of non-verbal communication (making it unsuitable for every patient) which further indicate the need for optimum skills to properly use online therapy modules [71].

From the patient side, a number of negative feedbacks have been accrued to iCBT with respect to insight gained, symptoms and task implementation. A study conducted by Rozental *et al.* to access patients' negative views of online psychotherapy showed that patients felt the understanding gained from modules of iCBT about their mental condition (having the full understanding of the mental disorder condition) was rather upsetting with increased vulnerability and regrets [61]. Consequently, others claimed that emergence of new symptoms led to the exacerbation of their conditions. Other referred to the performing of different tasks prescribed in the programs as being novel to their lifestyle and burdensome, thus increasing their stress level. Further, some felt more pressurized and frustrated from the tight schedule, one-way communication pattern (for smartphone users) and lack of flexibility to complete tasks.

Another qualitative study analysis conducted by Yfriesen *et al.* on psychology graduate students considered guided iCBT as beneficial for novice therapists learning cognitive behaviour therapy as asynchronous communication allowed them to reflect on their clinical emails and seek supervision when necessary [80]. Further, students associated some advantages to guided iCBT such as possibility improve mental healthcare access for patients and perceived iCBT as a relevant tool for the future practice [80]. They further highlighted some prerequisites that would facilitate learning guided iCBT including legal supports, a function web application, technical assistance, formal and peer supervision and technical assistance [80]. However, challenges stated into tension arising from the learn approach, issues from working with non-responsive clients as well as addressing multiple complex issues via emails [80].

Table 2. Benefits and drawbacks of blended (online) therapy for depression according to therapists and patient [71].

Statements	Therapist (n= 12)		Patients (n=8)	
	Totally agree	Totally disagree	Totally agree	Totally disagree
Self-management				
Convenient to always have access to therapy content	92(11)	8(1)	100(8)	0 (0)
Encourages patients to take more responsibility for therapy	83(10)	17(2)	100(8)	0 (0)
Sessions can be completed in own time	92(11)	0(0)	80(6)	13 (1)
Patient-provider relationship				
Ability to see a patient therapist face-to-face	83 (10)	0 (0)	100(8)	0 (0)
Patient-therapist bonding could weaken	25 (3)	50 (6)	50 (4)	50 (4)
Changes in face- to- face				
Face-to-fare sessions can be optimally used. due to preparation in the online environment	75 (9)	8 (1)	88 (7)	13(1)
Difficulties or indistinct matters could be more difficult to discuss	25 (3)	58 (7)	50 (4)	50 (4)
Possible drawbacks				
It is not suitable for every patient	92 (11)	0 (0)	88 (7)	13 (1)
It could came interpretation problems due to the lack of non-verbal communication	75 (9)	0 (0)	80 (6)	25 (2)
Therapists might need to invest much time to read all the online assignments	33(4)	42 (5)	25 (2)	63 (5)

2.4 Advantages of iCBT

There are three principal advantages of iCBT— patient empowerment, increased clinical efficiency, and cost-effectiveness.

2.4.1 Patient empowerment.

With iCBT, patients are enabled to make their schedule irrespective of time and place once they have access to an internet connection [25], breaking geographic barriers and; providing unlimited access for remote patients. For instance, iCBT programs are now being prescribed by primary care physicians to patients living in remote areas of Australia and Scotland that are suffering from anxiety disorder [22]. Furthermore, iCBT programs empower patients to handle issues in real-time and thus preclude them from waiting list appointment [22]. To add, it comprises of patients' ability to receive their preferable treatment agreed upon with therapists as well as ability to make joint decision during their course of treatment [22].

iCBT serves as a better alternative for people that are discomforted from using the traditional CBT. These could be due to physical conditions (such as pain) or psychological issues (social anxiety such as shyness), and such patients can seek and receive any of the treatments listed in the Table 3. Additionally, iCBT is promising to address the issue of social stigmatization link with mental healthcare and change people's approach towards seeking professional treatment [16]. The internet as a platform promotes more adherence, guarantees privacy and anonymity, thus fostering depressed patients or introverts to be more receptive to receive treatment [3].

2.4.2 Increased clinical efficiency

iCBT programs save time and resources for health-care providers. Similarly, guided iCBT programs have higher patient adherence than unguided iCBT programs [3]. Associated supports can include telephoning, emails exchange, which are swifter and less resources-consuming than face-to-face CBT. Additionally, therapist involvement time of intervention is shortened. For instance, in a randomized controlled trials carried out by Andrews *et* al., therapists spent a mean time of 18 minutes per iCBT patient which was far less than 240 minutes per face-to-face patient, with no significant difference between the two groups after intervention was conducted [5].

2.4.3 Cost-effectiveness

Hedman *et al.* randomized controlled trial study proved iCBT to be cost-effective and also effective against both somatic (e.g., chronic pain, irritable bowel syndrome) and psychiatric disorders (e.g., social anxiety disorder, panic disorder, OCD) [25]. On average, the probability of iCBT being cost-effective treatment was nearly 57% (range 38–96%) as compared with waitlisted controls [25]. In addition, the data included post-treatment and 6-month follow-up evaluations, and the results showed that there was a 79.5% probability that iCBT would be efficacious at a lower cost. In addition, they reported that the societal cost was reduced by $7,046 USD for each patient. Several other studies investigating societal costs showed that for each patient who improved using iCBT programs, the overall societal cost was reduced by $16,000 USD to $39,000 USD compared with waitlisted controls [25]. Therefore, implementing iCBT programs comes with a huge economic and cost benefit.

Another study also address the cost-effectiveness benefit involve during the translation of an existing (English) iCBT program into another language (Norwegian), instead of building a new one. Data showed that the cost of building a new iCBT application is four times of the cost of just translating a well-researched program [44].

2.5 Drawbacks of iCBT

2.5.1 Lack of direct patient monitoring

Many studies have shown that the lack of direct patient monitoring as a major factor contributing to low adherence, regardless of whether an iCBT is guided or not [53], [75]. A number of studies also noted that poorer adherence among anxiety patients is related to increased baseline symptom severity and baseline psychological distress [49]. During research trials, several factors contribute to why patient do not complete their programs — including time constraints, lack of motivation, technical problems, lack of face-to-face therapy, preference for medication preference, and scepticism regarding the treatment's effectiveness [15]. Different studies with different designs and interventions have proven that only few percentages of the total enrolled individuals complete their whole program sessions. For instance, only 37% completed the self-directed MoodGym program [67]; 27% trial participants completed the unguided Don't Panic Online Program [70]; 33% completed This Way Up Clinic's Sadness program, compared to 77% in a clinician-assisted version [56]. Moreover,

primary care physician-guided iCBT continuously showed adherence of up to 60%, and even clinical psychologist-guide increases the rates farther to 80–90% [75]. However, conflicting research showed that support may not necessary be provided by clinicians, but by trained technicians [37].

2.5.2 Misdiagnosis and inappropriate treatment

With iCBT, it is quite difficult to determine the critical cues with patient self-assessment on which treatment program is tailored [22]. Therefore, with iCBT, important cues like body language and voice are impossible to determine and this could possibly result in misdiagnosis and inappropriate treatment [22]. Nevertheless, many studies have shown that a good-befitting questionnaire may have the potential to determine these hiding important signs in some case [22].

2.5.3 Legal and ethical considerations for iCBT

Although, practically, legal and ethical considerations for iCBT has no effect on its cost, efficacy and effectiveness [9]. However, like other profession, there is dire need for psychologists to protect their practice, platform (e.g. iCBT) and patients; coming up with ethical principles for iCBT as well as having some legal permissions to prove their competence in offering treatment via the internet [16]. There were many national and international psychologist associations including— American Psychological Association in 1997, Canadian Psychological Association in 2006, European Federation of Psychologists' Associations in 2005, the Hong Kong Psychological Society in 1998 and the Japanese Psychological Association that were proactive at coming up with regulations and principles that could address all psychological practicing areas including the use of internet for psychotherapy service delivery internet [16].

Moreover, the International Union for Psychological Science's (IUPsyS) has a declaration called Universal Declaration of Ethical Principles for Psychologists which was adopted in 2008 by the Board of Directors of the International Association of Applied Psychology in Berlin [30]. IUPsyS comprised of over 70 nations with the goal of developing, representing, and advancing psychology as a basic and applied science [30]. The Universal Declaration in 2008 were amended to centre around four main principles that guarantee moral and ethical framework for any psychological organization and practice [30]. The fours principles are highlighted in the table below.

However, recently, there is no internationally unified ethical and legal considerations tailored for online psychotherapy and counselling [74]. For this reason, in order to shed light on vague guidance, many nations have come up with a solution of setting their laws, which are either orchestrated at the federal or state level. For instance, the Minnesota Department of Health (MDH) has a team called Minnesota eHealth and Privacy Security Workgroup—that provides resources and materials for healthcare professionals to implement security and robust privacy programs across the state [27]. Further, this workgroup clarified Minnesota law differences that centres on patients' access right to mental health records, such as under Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule— a Federal Law in comparison with Minnesota Health Records Act such as in the issue of disclosure of psychotherapy notes [27]. This document was designed for both mental health and behavioural health providers and constituted the summary of the legal analysis differences between HIPAA and the state [27]. Similarly in Europe, in spite of the free border pass and close economic ties, there are still enormous challenges with cross border online psychotherapy due to little cohesion or uniformity at the international level; Each member state has their own law which either support (such as United Kingdom) or against (such as Austria) this interventions [74]. Thus, for online psychotherapy service to be generally convene in Europe, there is need for legal and ethical regulations to overcome these challenges of jurisdiction across European member states [74].

2.5.4 Dissemination challenges based on jurisdiction

Importantly, iCBT intervention is majorly subjected to ethical and legal regulations guiding clinician-patient online interaction which in many cases can hamper or disallow its adoption and dissemination. [18]. For instance, Norway maintains telephoning guidance to provide CBT; providing mental therapy via emails exchange is banned, thus consequently hindering the operation and dissemination of Swedish iCBT programs in Norway [74]. Similarly, online psychotherapy was regarded inappropriate in Germany [9] and disallowed in Austria [27]. Opposite situation is in the United Kingdom, where online psychotherapy is deployed [74].

2.5.4.1. Accessibility issues

Research carried out by World Bank in 2014 showed that about 25% of the population in high-income countries have no internet access, and up to 30% may not own a computer. For instance, estimate for July 2016 by Internet Live Stats showed that over 100,000 residents in Estonia, a vast e-country, are internet non-users (more details in Table 4). Thus economically

disadvantaged people in remote area may not have the resources necessary to benefit from iCBT programs. Additionally, patients who are not technology savvy or proficient may not embrace replacing in person visits with iCBT [8]. Andersson *et al.* in their work proved that iCBT programs are preferred by educated and technologically savvy patients [11]. Therefore, for effectiveness iCBT program designs must be user friendly in order to obtain great response from those that are less technology savvy [14].

2.5.4.2. Liability issues

Similarly to face-to-face treatment, a number of liability issues may intensify even for online psychotherapist providers, such as liability in handling emergency and critical situations due to distance [18]. Holmes posited concerns arising from lack of professional licence to cover a particular jurisdiction and flaws from potential breaches of internet use confidentiality rules [28]. Further, Banach and Bernat stated that as every practitioner responding to an e-mail or text message is accountable and already in a fiduciary relationship with the client, there is possibility to prosecute practitioners for breaching confidentiality regulations of emails and text messages, especially if they mistakenly sent information to a third party [6]. Online psychotherapists may also face legal action for assessment inaccuracies or misdiagnoses [64]. However, some of these liability issues could be controlled by potential safeguards including creating encrypt communications that will protect and guarantee maximum confidentiality and privacy; proven competence and knowledge of iCBT programs, knowledge of pertinent legislations, use of disclaimers that backs therapists responsibilities [6].

2.5.5 Negative attitudes of both patients and clinicians towards iCBT intervention

One of the commonest dismay towards iCBT intervention was the negative attitudes shown by some clinicians and patients [4]. Some clinicians perceived the emergence of iCBT as a threat to the traditional face-to-face CBT whilst some patients underestimated iCBT intervention has an inadequate tool that could not give enough cues for their befitting therapy [4]. However, a study has shown the positive attitude of clinicians towards iCBT when therapy was designed for children and adolescent with mild/moderate depression problem [63]. Nevertheless, enormous concerns were raised toward the strength of its effectiveness for a deeper problem

[63]. Interestingly, a study conducted by Hadjistavropoulos *et al.* proposed education as a solution to tackle the scepticism faced by clinicians [25].

Similarly, many practising psychotherapists have the fear of losing their job if iCBT is fully adopted and disseminated [4]. However, this is baseless because, with the insufficient number of therapists, there is a need for more trained clinicians to attend to a large scale of people in dire need of evidence-based psychological treatments [4]. Therefore, iCBT should not be seen a full replacement but rather as a complement to tradition face-to-face treatment [4].

3. An introduction to EU research projects and methodology used for iCBT evaluation— recent and past projects

3.1 Mastermind Project

MasterMind **(Ma**nagement of mental health di**s**orders **t**hrough advanc**e**d technology and se**r**vices– telehealth for the **MIND**) — is a recent European Union project design to ensure high-quality treatment against depression; making treatments more widely available for adults suffering from the mental illness by the use of ICT [48]. The multimillion project was funded by CIP ICT PSP the run between March 2014 and February 2017.

As part of MasterMind objectives is to implement iCBT programs on a large scale (more than 5.000 patient overall), evaluating the impact of iCBT cum video conference for collaborative care and treatment for depression across 10 EU and Associated Countries. The project intends to evaluate both success and barriers factors that could hinder its service implementation, considering other factors including political, social, economic and technical health care contexts and from the perspective of different key stakeholders — patients, professionals and health insurances, and coming up with strategic solutions that can tackle those barriers [48]. Being a recently concluded project, neither the success nor the failure of the project are has been announced.

3.2 PREDI-NU Project

PREDI-NU (**Pre**venting **D**epression and **I**mproving Awareness through **N**etworking in the European **U**nion) was an European funded project in Health programmes held between September 2011 and August 2014. Pilot study was conducted in European countries including Estonia, Hungary, Germany, Ireland and Spain. This project was intended to give solutions to the alarming rate of depression and suicide and targeted against people suffering from these mental disorders [18]. The major aim of the project was to facilitate mental health promotion and prevent suicide and depression via information and communication technology (ICT), particularly by developing online psychotherapy program (iFightDepression) to treat mild and moderate form of depression. The online platform (ifightdepression.com) also supports online learning and awareness of suicidal behaviour and depression [18].

The development of the tools and website can be categorised into two phases —preparatory and pilot phases. The former included extensive systematic reviewing of iCBT literatures, website and content development for iFightDepression tool, agreement on materials by consortium members and training modules for healthcare professionals. In the pilot phase, the

tool was introduced to healthcare professionals, tested by enrolled patients and its acceptability and feasibility of its use was also evaluated.

At the end of the speculated project period, all objectives were met and the project was successful with development of multilingual iFightDepression website, self-management tool and professional training materials [18]. Additional, further evaluation showed resources befit and met the need of the target group.

Table 3. List of iCBT resources [22].

Name	Description	Country Available	Fee
THIS WAY UP Clinic **(https://thiswayup.org.au/clinic/)**	A web-based virtual clinic designed for patients with depression and anxiety disorders. The program is endorsed by the Australian government. Patients must be referred by a clinician. This 6–8 week course includes 5 to 6 lessons. Significant reductions in psychological distress and disability have been achieved with this program.	AUS	Yes
Phobia Free, Stress Free (http://virtually-free.com/)	Apps designed for patients with panic disorder and phobias. These programs are advocated by the NHS and AnxietyUK. They are designed to provide meditation, relaxation, self-hypnosis, and breathing techniques to treat fear, anxiety, and stress. The website claims more than 19,000 users of the apps. A new program, Agoraphobia Free, is currently in clinical trials.	INT	Yes
MoodKit **(http://www.thriveport.com/products/moodkit/**	An app designed for users with mood disorders including anxiety. It includes over 200 mood-improving activities, thought modulation strategies, progress tracking features, and export capabilities to integrate with clinical treatments	INT	Yes
Beating the Blues **(http://www.beatingtheblues. co.uk/)**	An online program designed for depression or anxiety patients. Recommended by the UK NICE. Patients must be referred by a physician for NHS coverage; it is available internationally for a fee. The program consists of eight 50-minute sessions where patients are taught to identify symptoms and set goals. Data show statistically significant improvements in anxiety and depression.	INT	Yes
FearFighter **(http://www.fearfighter.com/)**	An online program designed to treat patients with panic and phobia. This program is available to NHS patients in the UK (and must be prescribed by a general practitioner); it is available internationally for a fee. The program has 9 interactive steps with downloadable content, videos, and homework exercises to challenge avoidance behaviours. Patients and referring health-care providers praise its ease of use and reported a high level of satisfaction with this program.	INT	No

MoodGYM **(https://moodgym.anu.edu.au/welcome)**	An online program developed for patients with anxiety and depression. The program is supported by the Australian government. This program consists of five interactive modules, quizzes, and homework, and has been translated into Finnish, Dutch, Norwegian, and Chinese. There are at least 600,000 registered users, and the majority of users found this program as acceptable as in-person CBT.	INT	No
Online Therapy USER **(https://www.onlinetherapyuser .ca)**	An online program focused on developing general well-being, well-being after cancer, and maternal depression. A course for fibromyalgia patients is currently in clinical trials. The program has 5 to 7 modules depending on the course and is completed in 7 to 8 weeks with weekly email therapist interactions. According to the website, 262 patients started it with 190 having fully completed the course; 96% felt it worth their time.	Sask	No
Pain Squad **(http://www.campaignpage.ca/sickkidsapp/)**	An app developed to help manage pain in children with cancer. It was developed by the Hospital for Sick Children in Toronto, ON, Canada. The app helps children journal their pain symptoms and evaluates medications and other physical and psychological pain management strategies. Research shows high adherence among adolescents.	INT	No
OCFighter **(http://www.ocfighter.com/)**	An online program developed for patients with OCD. The program has 9 steps/modules with worksheets and emails containing tips. The program reduces OCD symptoms. Adherence rates are good with as little as 16 minutes of therapist support per week.	INT	Yes
PTSD Coach **(https://itunes.apple.com/us/app/ptsd-coach/id430646302?mt=8&ign-mpt=uo%3d2)**	An app developed for patients with PTSD. Versions of PTSD Coach have been developed by the US Department of Veterans Affairs, (PTSD Coach), Veterans Affairs Canada (PTSD Coach Canada), and the Australian Government Department of Veteran Affairs (PTSD Coach Australia). The program has features for self-assessment and symptom management, includes links to support groups, and provides educational resources. The international version of this app is estimated to have been downloaded more than 130,000 times in at least 78 countries, and patients reported satisfaction, improved symptom control, and better sleep.	INT	No

Optimism **(http://www.findingoptimism .com/)**	An online program, app, and stand-alone software developed for people with anxiety, depression, bipolar disorder, and PTSD. The program features include tracking the user's mood to identify triggers, determining effective strategies, and developing a wellness plan. It also offers a clinician interface. According to the website, the program is used by thousands of people and mental health providers in over 80 countries.	INT	No
iCouch CBT **(http://secure.icouch.me/)**	An app developed as a companion to iCouch online therapy. The program helps the user break down incidents or situations into their base components to identify the distorted thinking and helps the user develop new, positive thoughts. Notes can be emailed to a therapist.	INT	Yes
eCBT **(http://www.mymindapps.com/)**	Several apps including eCBT Calm, eCBT Trauma, and eCBT Mood were developed for patients with anxiety, depression, or PTSD. Depending on the program selected, these apps include thought identification and challenge tools, daily and weekly assessments, and relaxation training.	INT	Yes

Key: AUS, Australia; UK, United Kingdom; Sask, Saskatchewan, Canada; INT, internationally available.

Table 4. Internet users in Estonia [30].

Year	Internet users**	Penetration (% of pop)	Total population	Non-users (internet less)	1Y User Change	1Y User Change	Population Change
2016*	**1,196,521**	91.4 %	1,309,104	112,583	2.2 %	25,795	-0.26 %
2015	**1,170,726**	89.2 %	1,312,558	141,832	5.6 %	61,957	-0.28 %
2014	**1,108,769**	84.2 %	1,316,203	207,434	5.8 %	60,650	-0.29 %
2013	**1,048,120**	79.4 %	1,320,050	271,930	1 %	10,206	-0.3 %
2012	**1,037,914**	78.4 %	1,324,040	286,126	2.2 %	21,942	-0.3 %
2011	**1,015,972**	76.5 %	1,328,068	312,096	2.9 %	28,894	-0.3 %
2010	**987,078**	74.1 %	1,332,089	345,011	1.9 %	18,469	-0.29 %
2009	**968,609**	72.5 %	1,336,013	367,404	2.4 %	22,879	-0.29 %
2008	**945,730**	70.6 %	1,339,941	394,211	6.3 %	55,983	-0.32 %
2007	**889,748**	66.2 %	1,344,233	454,485	3.8 %	32,764	-0.38 %
2006	**856,984**	63.5 %	1,349,369	492,385	2.9 %	23,930	-0.46 %
2005	**833,054**	61.5 %	1,355,662	522,608	14.8 %	107,646	-0.58 %
2004	**725,408**	53.2 %	1,363,549	638,141	16.6 %	103,214	-0.68 %
2003	**622,194**	45.3 %	1,372,890	750,696	8.4 %	48,082	-0.71 %
2002	**574,112**	41.5 %	1,382,735	808,623	30.8 %	135,326	-0.65 %
2001	**438,785**	31.5 %	1,391,754	952,969	9.7 %	38,952	-0.53 %

* Estimate for July 1, 2016

Estonia Internet Users: 1,196,521

Internet Users in Estonia (2016*)

Share of Estonia Population: 91.4% (penetration)

Total population: 1,309,104

Share of the World Internet Users: 0%

Internet User in the World: 3,424,971,237

** **Internet User** = individual who can access the Internet at home, via any device type and connection.

Elaboration of data by *International Telecommunication Union (ITU), World Bank, and United Nations Population Division.*

Table 5. Internet-based psychotherapy (IBP) and the Universal Declaration of Ethical Principles for Psychologists [18].

Principle	Issues pertinent to ICBT
• Respect for the dignity of persons and peoples	Consent
	Privacy
	Confidentiality
	Fairness and justice in the treatment of persons and peoples
• Competent caring for the wellbeing of persons and peoples	Taking care to do no harm
	Developing and maintaining competence
• Integrity	Avoiding incomplete disclosure
	Maximizing impartiality and minimizing biases
	Not exploiting for personal, professional, or financial gain
• Professional and scientific responsibilities to society	Responsibility to increase scientific and professional knowledge
	Responsibility to protect such knowledge from being misused
	Responsibility to adequately train its members
	Responsibility to develop ethical awareness

4. Methodology

The methodology used was strictly qualitative and all qualitative data were themed, subjected and in conformity with Model for ASsessment of Telemedicine applications (MAST) method [13] [48]. To add, all interview sessions were audio-recorded and later transcribed into letters.

MAST is a widely used assessment framework in the EU for the evaluation of telemedicine applications and services. The model investigates the effectiveness and care quality prior to decision making for the purpose of investing in the service such as at a hospital [48]. The framework process is multidisciplinary that evaluates and provides concise information on issues including social, ethical, economic and medical to mention a few.

The model has 7 domains to evaluate novel telemedicine technologies, namely:

- Health problem and characteristics of the application
- Safety
- Clinical effectiveness
- Patient perspectives
- Economic aspects
- Organisational aspects
- Socio-cultural, ethical and legal aspects [48].

4.1 Participants Recruitment

Invitations were sent via emails to mental healthcare professionals including general practitioners (39), psychologists (19), psychiatrists (2), nurses (22), midwife (5), others such as coaches, pedagogues, etc. (5)— 88 in all; who are all members of PRAXIS and part of the Estonian MasterMind project. These people are believed to have tried using iCBT or are well-informed about iCBT intervention. Only 20.7% of invitees (17 participants) later responded and participated in the interview session whereas others either ignored and failed to reply or gave excuses for their absence.

4.2 Procedure

Seven participants were interviewed on site at the eMedicine Laboratory in Mektory, Tallinn, Estonia whereas the other two joined via Skype video calls. Pertinent questions obtained from

MAST framework were asked to gather their perceptions of mental health professionals on barriers and facilitators of iCBT implementation. Further, four themes were discussed in all, namely professionals profile, satisfaction and usability, hindering and facilitating factors for Mastermind services. Every question fitted the highlighted themes of discussion. Generally, the whole interview sessions were conducted in Estonian language. Audio recording of the whole interview sessions and notes were taken by a master and PhD student who are natives of Estonian respectively.

5.0 Results

The qualitative unstructured data were organised into themes, namely:

1. Patient profiles
2. Healthcare professional profiles
3. Satisfaction and usability
4. Hindering and facilitating factors implementation of MasterMind services

5.1 Patient profile

a. Needs of the patients

The healthcare professionals clarified and agreed on the dire patients' need for an access to relevant information; acquiring certain knowledge and understanding of the pertinent modules to be fulfilled and several relevant technical skills to complete modules on time. Further, it is essential for such patients to either possess a smartphone to do necessary therapy *(in case they choose CBT Basic app)* or any other device with internet access.

> "*…a depressed person needs more time to focus on tasks as well as needs treatment to improve concentration.*"

All professionals agreed that online psychotherapy is cost-effective in terms of time and paper. They stated patients unnecessary need to write their thoughts and emotions manually on the paper which takes from patients more concentration and time. Also, professionals were convinced that internet-based CBT provides an opportunity for more secure note taking—psychotherapy notes are neither lost nor seen by third parties. They further emphasized, with iCBT, patients can feel specialist's support before the next appointment.

> *"…a patient could safely take notes and then come to the therapy and communicate with a specialist."*

They ended up with a consensus that iCBT, like any first aid, is essential particularly when an appointment with physicians takes longer time. This means that patient can start with a therapy even before taking medicine.

b. Drop out and safety

i. Drop-out

The therapists agreed on the major reasons for drop-out of patients:

- Improved patient health as a result of chemotherapy (antidepressants were taken before cCBT therapy)
- Co-morbidities such as schizophrenia or personality disorders disturbs concentration to complete modules
- Major depressive disorder
- Time deficiency to focus on tasks and worksheets
- Suicidal thoughts and attempts
- Alcohol and drugs addiction

> *"…depression has severity and remission periods and is not completely curable. Healthcare professionals should be ready for that. I think that cCBT is better than just reading self-help books."*

Further, they stated the importance of such depressed patients follow-up to know if they are using any special forum to share their experience and thoughts according to cCBT.

> *"…a depressed person is more sensitive and vulnerable and could be easily criticised or offended by others."*

ii. Safety

Healthcare professionals viewed cCBT as safe to use and guarantee users' privacy and security. Also, it has a positive effect on discipline.

> *"…I think cCBT is mostly used by patients who have white coat syndrome."*

5.2 Profile of the healthcare professional

The healthcare professionals specified the need for the following prior to the implementation of MasterMind service as a routine practice:

- Time to learn CBT therapy method and treatment specifics
- Good knowledge during online supervision (including learning the technical part)
- Motivation
- Ability to control patients through any software platform

They thought a depressed patient needs more time during face to face appointment. It takes additional time to discuss cCBT modules. HCP has to spend more than 20% of the official working time to document patients' records after appointments. Also, they commented on

appropriate CBT training (which may take nearly 2 years) a priority to provide cCBT for patients. Consequently, they felt the lack of experience or need for change in the attitude of therapists without initial cCBT experience or training is responsible for their indifferences towards the efficacy of cCBT in spite of its international recognition for depression treatment.

> *"I cannot recommend to the patients something that I don't know and don't understand."*

They stated the important of having cCBT programs (a web-based or phone application) that are easy, logically structured and simple to comprehend for the users.

5.3 Satisfaction and usability of the service

a. Service satisfaction

The therapists expressed their difficulty to provide for patients a new online service and convince them about its effectiveness. Unfortunately, they agreed that their insubstantial knowledge and lesser experience coupled with their dissatisfaction have a strong effect on cCBT satisfaction measurement. For instance, during the early stage of iFightDepression program, the professionals highlighted major concerns regarding this system, including—

- Program design was less attractive,
- functionality (not interactive nor connecting patients with professionals)
- Patients had to work on PC (using iFightDepression program)

Some healthcare professionals mentioned that the confusing pattern of the program and complexity of its worksheet may further discourage many patients from using cCBT. They proposed the need for iCBT user interface improvement — making it more user-friendly and easy in use

> *"…any internet based program is additional help for patients, but it is not enough to treat depression."*

> *"….cCBT— presence of modules is not sufficient to replace professionals input to the care process."*
>
> *"…patients have to be supervised by professionals".*

b. Usability of the service

The therapists noted that both programs (iFightDepression and CBT Basic app) could be usable at the GP's centres.

> *"…it is hard to promote among psychologists any web-based program without RCT evidence."*

In general, professionals agreed that cCBT could be effective in mild depression and anxiety treatment if a program attracts the patients' interests.

> "*…we know our patients and could offer cCBT, however, we never can predict whether patients would like to start with a treatment*."

> *"…cCBT gives a value to depressed patient in their treatment process."*

5.4 Facilitating and hindering factors implementation of MasterMind services

a. Facilitators in implementing the MasterMind services as a routine practice

The professionals highlighted the most important facilitators needed to overcome difficulties as well as implementing the MasterMind services to be:

- Time
- Resources (additional personnel who might supervise a depressed patient online worksheets and review whether any suicidal thoughts were written)
- Patients eligibility and willingness to contribute to the treatment process
- Financial resources as a motivation

Family doctors are convinced that cCBT is a good solution that suits both remote and foreign patients. Some professionals indicated that certain program could be effective in the treatment.

> *"…if we see that a program helps to recover from the depressive episodes and from that program benefit both - the therapist and the patient - then it will be easier to implement into daily routine care."*

b. The most important barriers in implementing the MasterMind services in routine practice.

The most important barriers during implementation mentioned were:

- Time (sometimes, professionals forget to provide new service for patients as they are used to old scheme)
- Lack of clinical knowledge to provide cCBT
- Appropriate training takes 2 years (CBT training)
- No existing legal regulation
- Sceptical attitude that online CBT cannot affect during treatment process
- Non-eligible patients.
- Lack of adherence from patients
- Existence of co-morbidities and addiction (drugs and alcohol)
- Language to understand and fill the modules
- Age

"...I have no sufficient skills as I could not find time to pass a full training."

The professionals clarified patients' disparities in selecting their choice of mental treatment plan and procedure— some prefer to write their thoughts on a paper and use medical devices to chat with someone. Others prefer face-to-face therapy and have no interest to use new technology and e-solutions.

"...no existing regulation from the government which will support professionals to promote and offer cCBT to use in daily routine care."

They stated further that if a cCBT is a healthcare service, then it should be provided by registered healthcare provider (i.e. MD, RN or MN) – this means that psychologists cannot provide cCBT as a healthcare service.

In an ideal world, many a healthcare professional was of viewpoints that patients are informed and ask for an opinion whether they have to start with an iCBT.

"...patients should trust innovative treatment methods and believe in their care process, otherwise it will not work."

Some HCPs insisted that not all iCBT programs are evidence-based, and to others, there is need to prove their effectiveness.

"…an additional human resource with medical education could be beneficial in terms of monitoring and be consulting patients to complete modules and fulfil worksheets. Also, certain regulation could be changed in terms of provision of healthcare services".

6.0 Discussion

This present study explored the perceptions of some few mental healthcare professionals in Tallinn, Estonia on what they have personally considered as the facilitators needed and barriers confronting the implementation of internet-delivered cognitive behavioural therapy services. The interview led to results that were later organised into four key themes including — Patient profiles, Healthcare professional profiles, Satisfaction and usability and Hindering and facilitating factors for the implementation of MasterMind services.

Regarding the patient profiles, both the needs of the patients and safety and drop-out issues were considered. The former, the needs of the patients, clarified and highlighted the basic things patient should possess before choosing iCBT services, which include having smartphones and some ideas of what cCBT modules comprise. With this, patient waiting time is reduced and treatment plan can be initiated as quickly as possible even before a therapist visit as compared with traditional CBT [55], [75]. Further, it was undoubted that iCBT guarantees reduced cost and secure note-taking. Patient drop-out or adherence was associated with factors such as chemotherapy, complications and or multiple disorders (suicidal thoughts, major depressive disorders), lifestyle (alcohol and/or drug addiction) and time. In a different light, Richard and Richardson in their study showed that drop-out or adherence in iCBT was a dependence on the type of guidance— guided iCBT reduced drop-out and increased adherence [58]. To add, a practical example was seen in a study conducted by Kraepelien *et al.* who proved the effectiveness of iCBT for Parkinson disease patients with anxiety and depression: and this showed the engagement of therapist to reduce dropout and inactiveness [40]. Also, a research conducted by Gajecki *et al.* to study the influence of drug and/or alcohol in patients using iCBT showed that such problematic substances do not forbid patients from iCBT treatment but can exacerbate the treatment outcome, particularly in patients with panic disorders and social anxiety [24]. The safety, privacy and security embedded in iCBT usage had gain significance consideration. The position of the healthcare professionals interviewed in this study aligned with the perceptions of psychotherapist participants, many of whom viewed iCBT as a safe, evidence-based and structured tool for patient use [9].

Moreover, the therapists interviewed considered some important needs for mental healthcare professionals with an interest to deploy or implement iCBT service as a routine practice, and these needs centred on motivation and acquiring profound knowledge of the program cum

training for the new online psychotherapy intervention and pertinent skills for online patient handling. The fear and scepticism of therapists towards iCBT could be traced from their inadequate knowledge of the program: these factors could preclude a therapist from referring a patient to use iCBT service despite its effective evidence. This was similar in the attitude displaced by government bodies in an E-COMPARED Consortium project which addressed the attitudes towards digital depression treatment amongst European stakeholders from eight European countries [67]. Further, it was revealed that participant from organisations from frontrunner countries in e-mental health gave greater knowledge and insight thus embraced and showed more positive attitudes towards digital treatments compared to other organisations [67]. The healthcare professionals shared similar concerns on the service satisfaction which they thought would be based on its simplicity; attractiveness of the program, the level of connection (functionality) the program provides for patients and therapy and its availability on different gadget (unlike the first iFightDepression program that is solely available on personal computer, and not smartphones). They proposed the need for iCBT user interface improvement — making it more user-friendly and easy in use which had been described in a previous study by Pincus *et al*. as "central to successful implementation" [56]. Conversely, they felt the complexity of the iCBT program including in its worksheet may discontinue the patients' interest. Further, they expressed the possibility to deploy the iCBT programs (such as iFightDepression and CBT Basic app) in everyday use but anticipating needs for more evidence-based research works (RCTs) to boosts their usability [49].

Both the facilitating factors and barriers were general and similar to what have been highlighted in previous studies [51], [25]. cCBT, being considered as a good solution that suits both remote and foreign patients, the therapists made references to patient eligibility and willingness to contribute to the treatment process, motivation (financial incentives), proven effectiveness in real patients, and availability of real-time therapists to supervise depressed patient online worksheets including assessment of suicidal thoughts timely — as facilitating factors capable of triggering the implementation of mastermind service in Estonia. Both the facilitating factors and barriers were general and similar to what have been highlighted in previous studies [51]. cCBT, being considered as a good solution that suits both remote and foreign patients— an opposite of a meta-analysis conducted by Andersson and Cuijpers [3], when evaluating iCBT effectiveness on patients with depression; the therapists made references to patient eligibility and willingness to contribute to the treatment process, motivation (financial incentives), proven effectiveness in real patients, and availability of real-time therapists to supervise depressed patient online worksheets including assessment of suicidal thoughts timely — as facilitating

factors capable of triggering the implementation of mastermind service in Estonia. However, the therapists considered pitfalls of cCBT implementation, such as, lack or insufficient clinical knowledge to provide cCBT service [73], fear of lack of adherence by patients [58], scepticism towards cCBT effectiveness during treatment process [25], manipulation from co-morbidities and addictions that could affect cCBT treatment effectiveness[78], patient preference (some patients still prefer the traditional face-to-face mental therapy), time (changing from old to new scheme requires more time, and CBT training could take 2 years) [63], unsuitability of cCBT treatment for all age-group, and lack of legal regulation to enhance and back cCBT services and providers [74], [18].

Lastly, in the real and ideal world, they thought the choice of treatment type should be patient-centred; informed patients should ask for opinion either to start with an iCBT or not and should at least trust the intervention (in the case of iCBT) to further boost the care process. However, some HCPs insisted that not all iCBT programs are evidence-based, therefore, there is need to prove their effectiveness. And to further increase patient adherence to enhance effectiveness, they noted that iCBT intervention should be guided by a therapist and backed by medical education [25], [32] [65].

6.1 Limitations of the study

This study comes with some limitations, such as only a few participants (healthcare professionals) answered and completed the whole study. To add, the study considered and evaluated only physician perceptions, but failed to address patients' views and other stakeholders such as programs designers etc. Importantly, the study is deficient of how legal regulations can influence the implementation or back the usability of iCBT.

7.0 Conclusion

To sum up, iCBT program is a newly promising and revolutionary technology that comes with an approach tailored to combat mental diseases such as mild and moderate depression. However, with its awesome benefits favoured by the present internet age, there still exist many impeding barriers that bring concern on its widespread uptake and implementation in a routine clinical practice, which consequently led to the disparities of whether iCBT should play a full or partial role in patient (depression) care trajectory. Additionally, the effects that other factors, such as, legal obstacles (no regulations to support ICBT) and technical challenges (lack of technical interoperability— no connection between ICBT program and GP software systems) have on iCBT implementation preclude it from being a public procurement.

8.0 Recommendation for future research

Future study should include the patients' views; cooperation and willingness to adopt the iCBT intervention. Also, the possibility of mental health promotions and awareness could encourage and support patient usability. Further, the roles of legal regulation should be demonstrated and how its impact can backup privacy and confidentiality, acceptability, usability as well as further implementation. Lastly, prospective research should also address the interoperability (semantics and technical), business part (including the billing) as well as strategies to integrate iCBT intervention for depression treatment into routine primary care practice.

9.0 Summary

This academic project pointed out thoroughly the enablers that facilitate and barriers confronting the implementation of iCBT in Estonia. Although, the research solely considered the perceptions of some Estonian PRAXIS healthcare professionals who were believed to have used iCBT or have substantial knowledge about this intervention.

The data obtained was qualitative and MAST evaluation method was used. Nearly 21% (of 88) invitees (healthcare practitioners, psychologists, psychiatrists, nurses, midwives, coaches and pedagogues) recruited via email finally participated in the interview sessions. These qualitative data was categorised into four themes— patient profiles, healthcare professionals profile, satisfaction and usability, hindering and facilitating factors for iCBT.

The results clearly showed that implementation of iCBT will require the cooperation of all stakeholders, particularly the healthcare professionals, designers and patients. Generally, the HPs perceived the intervention as innovative, safe and helpful and mean to reach remote patients but skeptical about its effectiveness to address the mental challenges of the patients. They are unsure about patient adherence and if the intervention could tackle co-morbidity; insufficient clinical knowledge to provide iCBT, just to mention a few, were perceived as blockades to the implementation process. They suggested that solutions such as incentives, sufficient clinical knowledge of iCBT provision, effective and secured iCBT programs with attractive interface have been considered to have the potentials to handle these accrued anomalies. Importantly, they suggested iCBT should be considered rather as a stepped care for anxiety and mild/moderate depression.

The research neither addresses the views of patients or other important stakeholders' nor the legality to support iCBT usability and implementation. Additionally, to quicken implementation, it is important to acknowledge and proffer solutions to these problems faced by physicians and other notably challenges accrued to the patients, as well as improving the quality and functionality of the iCBT programs, thus making its effective for their intended purposes.

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References

1. Almlöv J, Carlbring P, Källqvist K, Paxling B, Cuijpers P and Andersson G (2011). Therapist effects in guided internet-delivered CBT for anxiety disorders. *Behav Cogn Psychother*, 39 (3): 311-322.
2. Andersson, G, Cuijpers, P. Carlbring, H. Riper and E. Hedman (2014). Guided internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: A systematic review and meta-analysis. *Official Journal of the World Psychiatric Association (WPA)*, 13 (3): 288–295
3. Andersson G and Cuijpers P (2009). Internet-based and other computerized psychological treatments for adult depression: a meta-analysis. *Cogn Behav Ther*. 38: 196-205.
4. Andersson, G and Titiov, N (2014). Advantages and Limitations of internet-based intervention for common mental disorders. *World Psychiatry*, 13(1): 4-11.
5. Andersson G, Estling F, Jakobsson E, Cuijpers P and Carlbring P (2011).Can the patients decide which modules to endorse? An open trial of tailored internet treatment of anxiety disorders. *Cogn Behav* Ther, 13:***4***–11.
6. Andrews G, Davies M and Titov N (2011). Effectiveness randomized controlled trial of face to face versus Internet cognitive behaviour therapy for social phobia. *Aus N Zea J Psy- chiat.* 45(4):337-40.
7. Banach, M. and Bernat, F (2000). Liability and the Internet: Risks and recommendations for social work practice. *Journal of Technology in Human Services*, 17: 153–171.
8. Beattie, A., Shaw, A., Kaur, S and Kessler, D (2009). Primary-care patients' expectations and experiences of online cognitive behavioural therapy for depression: a qualitative study. *Health Expert.* 12(1): 45-59.
9. Bengtsson, J., Nordin, S and Carlbring, P (2015). Therapists' experiences of conducting cognitive behavioural therapy online vis-à-vis face-to-face. *Cogn Behav Ther*. 6073:1–10.
10. Berger, T and Andersson, G (2009). Internetbasierte psychotherapien: Besonderheiten und empirische evidenz. *Psychother Psychosom Med Psychol*. 59:159–70
11. Bergstrom, J., Andersson, G., Karlsson, A., Andreewitch, S., Ruck, C., Carlbring, P. and Lindefors, N. (2008). An open study of the effectiveness of internet treatment for panic disorder delivered in a psychiatric setting. *Nordic Journal of Psychiatry*, *63*: 44–50.
12. Bornas X, Rodrigo T, Barcelo F, and Toledo M (2002). New technologies in cognitive-behavioral therapy: a review. *International Journal of Clinical and Health Psychology*, 2: 533–541.
13. Braun, V. and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*. 3: 77-101.
14. Carlbring P and Andersson G (2006). Internet and psychological treatment. How well can they be combined? *Comp Hum Behav*. 22(3):545-53.
15. Centre for Disease Prevention and Control (2016). http://www.cdc.gov/mentalhealth/basics/mental-illness/depression.htm

16. Christensen H, Griffiths KM and Farrer, L (2009). Adherence in internet interventions for anxiety and depression. *J Med Internet Res*. 11(2):e13.
17. Cuijpers P, Donker T, Johansson R, Mohr DC, van Straten, A and Andersson G (2011). Self-guided psychological treatment for depressive symptoms: a meta-analysis. *PloS one*. 6(6):e21274.
18. European Alliance against Depression (EAAD). Http://www.eaad.net/mainmenu/research/predinu/
19. Fitzgerald T, Hunter PV, and Hadjistavropoulos, T (2010). Ethical and legal considerations for internet-based psychotherapy. *Cogn Behav Th* ?:173–87.
20. Fleming, T, Lucassen, M., Stasiak, K and M(2015). The impact and utility of computerised therapy for educationally alienated teenagers: The views of adolescents who participated in an alternative education-based trial. *APS*, dio:10.1111.cp.12052.
21. Gerhards S., Abma, T., Arntz A., de Graaf, L.,Evers S., Huibers, M and Widdershoven, G (2011). Improving adherence and effectiveness of computerised cognitive behavioural therapy without support for depression: A qualitative study on patient experiences. *J Affect Discord.* 129(3):117-25.
22. Glasgow R. E., Vogt, T. M. and Boles, S. M (1999). Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *J. Public Health*. 89:1322–7.
23. Gratzer, D, Khalid-Khan F., and Khalid-Khan S (2015). Anxiety — Is There an App for That? Considering Technology, Psychiatry, and Internet-Assisted Cognitive Behavioral Therapy. *INTECH*, 16:328-46.
24. Gajecki, M., Berman, A.H., Sinadinovic, K., Andersson, C., Ljótsson, B., Hedman E. Rück, C. and Linderfors, N (2014). Effects of Baseline Problematic Alcohol and Drug Use on Internet-Based Cognitive Behavioral Therapy Outcomes for Depression, Panic Disorder and Social Anxiety Disorder. *PLoS ONE*. 9(8): e104615. doi:10.1371/journal.pone.0104615
25. Hadjistavropoulos H.D, Thompson, M.J., Klein, B (2012). Dissemination of therapist-assisted internet cognitive behaviour therapy: development and open pilot study of a workshop. *Cogn Behav Ther*. 41:230–40
26. Hedman, E, Ljótsson, B and Lindefors, N (2012). Cognitive behavior therapy via the internet: A systematic review of applications, clinical efficacy and cost-effectiveness. Expert Review of Pharmacoeconomics & Outcomes Research, 12 (6): 745–764.
27. Hintenberger, G. (2012). Die Internetrichtlinie für Psychotherapeutinnen und Psychotherapeuten in Österreich. Eine kritische Würdigung. *eberatungsjournal.net*. http://www.eberatungsjournal.net/ausgabe_0112/hintenberger.pdf
28. HIPPA, Minnesota's Health Records Act, and Psychotherapy Notes (2014). Minnesota Department of Health, Office of Health Information Technology.www.health.state.mn.us/e-health.
29. Holmes, K. 2008. How ethically we practice online: An exploration of potential online provider liability. *Annual Review of Cybertherapy and Telemedicine*, 6: 99–104.
30. Internet live statistics (2016). www.InternetLiveStats.com
31. International Union for Psychological Science's (2008). http://www.iupsys.net/about/archives-and-documents/
32. Johansson, R and Andersson, G (2012). Internet-based psychological treatments for depression. *Expert Review of Neurotherapeutics*. 12: 861-870.
33. Kaltenthaler E, Brazier J and De Nigris E, (2006). Computerised cognitive behaviour therapy for depression and anxiety update: a systematic review and economic evaluation. *Health Technol J,* 10(3):1-199.

34. Kenwright, M., Marks, I., Graham, C., Franses, A. and Mataix-Cols, D. (2005). Brief scheduled phone support from a clinician to enhance computer-aided self-help for obsessive-compulsive disorder: randomized controlled trial. *Journal of Clinical Psychology*, *61*: 1499–1508.
35. Kessler D, Lewis G, and Kaur S (2013). Therapist-delivered internet psychotherapy for depression in primary care: a randomised controlled trial. *Lancet*. 374:628–34.
36. Kessler, D., Lewis, G., Kaur, S., Wiles, N., King, M., Weich, S., Sharp, D., Araya, R., Hollinghurst, S and Peters, T (2009). Therapist-delivered in[illegible]t psychotherapy for depression in primary care: a randomised controlled trial. Lancet. 374: 6[illegible]
37. Kiropoulos, L. A., Klein, B., Austin, D. W., [illegible], K., Pier, C., Mitchell, J. and Ciechomski, L (2008). Is internet-based CBT for panic disorde[illegible]d agoraphobia as effective as face-to-face CBT? *Journal of Anxiety Disorders*, *22*: 1273–1284.
38. Klein B, Austin D, Pier C, Kiropoulos L, Shandley K and Mitchell J (2009). Internet-based treatment for panic disorder: does frequency of therapist contact make a difference? *Cog Behav Ther*. 38(2):100-13.
39. Knowles, S., Lovell, K., Bower, P., Gilbody, S.Littlewood, E and Lester, H. (2015). Patient experience of computerised therapy for depression in primary care. *BMJ OPEN*. doi: 10.1136/bmjopen-2015-008581.
40. Kraepelien, M., Svenningsson, P., Linderfors and Kaldo, V (2015). Internet-based delivered cognitive behavioural therapy for anxiety and depression in Parkinsson's disease- A pilot study. *Internet Intervention.* 2(1):1-6.
41. Lange A, Rietdijk D, Hudcovicova M, (2003). Interapy: a controlled randomized trial of the standardized treatment of posttraumatic stress through the Internet. *J Consult Clin Psychol*. 71:901–9.
42. Learmonth, D., Trosh, J., Rai, S., Sewell, J. and Cavanagh, K (2008). The role of computer-aided psychotherapy within an NHS CBT specialist service. *Counselling and Psychotherapy Research*, *8*: 117–123.
43. Litz, B. T., Engel, C. C., Bryant, R. A. and Papa, A. (2007). A randomized, controlled proof-ofconcept trial of an internet-based, therapist-assisted self-management treatment for posttraumatic stress disorder. *American Journal of Psychiatry*, *164*: 1676–1683.
44. MacKinnon, A., Griffiths, K. M. and Christensen, H (2008). Comparative randomised trial of online cognitive-behavioural therapy and an information website for depression: 12-month outcomes. *British Journal of Psychiatry*, *192*: 130–134.
45. MaLintvedt, O., Griffiths, K., Eisemann, M and Waterloo, K (2013). Evaluating the translation process of an Internet-based self-help intervention for prevention of depression: a cost-effectiveness analysis. *J Med Internet Res*. 15(1):e18
46. Marks, I. M., Mataix-Cols, D., Kenwright, M., Cameron, R., Hirsch, S. and Gega, K. (2003). Pragmatic evaluation of computer-aided self-help for anxiety and depression. *British Journal of Psychiatry*, *183*: 57–65.
47. Marks, M, Cavanagh, K and Gega L (2007). Computer-aided psychotherapy: Revolution or bubble? *Journal of Mental Science*, 191:471–473
48. Mastermind, 2014. http://mastermind-project.eu/about-the-project/
49. Mathiasen, K, Riper, H., Ehlers, L., Valentin, J and Rosenburg, N (2016). Internet-based CBT for social phobia and panic disorder in a specialised anxiety clinic in routine care: Results of a pilot randomised controlled trial. *Internet Intervention,* 4(1):92-98.

50. Mewton L, Smith J, Rossouw P and Andrews G (2014). Current perspectives on Internet-delivered cognitive behavioral therapy for adults with anxiety and related disorders. *Psychol Res Behav Manag*. 7:37-46.
51. Mol M, Dozeman E, van Schaik D, Vis C, Riper H. and Smit J (2016). The therapist's role in the implementation of internet-based cognitive behavioral therapy for patients with depression: study protocol. *BMC Psychiatry*, 16(338):1-8.
52. Morris, J., Firkins, A., Millings, A., Mohr, C., Redford, P and Rowe, A (2016). *NCBI.* 29(4): 415-31.
53. National Institute for Health and Care Exc (2009). Depression in adults: the treatment and management of depression in adults (Update- E clinical guideline 90).
54. Newby JM, Mewton L, Williams AD and Andrews G (2014). Effectiveness of transdiagnostic Internet cognitive behavioural treatment for mixed anxiety and depression in primary care. *J Affect Dis*. 165:45-52.
55. Olthuis, J.V., Watt, M.C., Bailey, K., Hayden, J.A and Stewart, S.H (2016). Therapist-supported internet cognitive behavioural therapy for anxiety disorders in adults (Review). *Cochrane Database of Systematic Review.* 3: CD011565. DOI:10.1002/14651858.CD011565.pub2
56. Pincus, H.A., Pechura, C. and Keyser, D (2006). Depression in Primary Care: Learning Lessons in a Narional Quality Improvement Program. Administration and Policy in Mental Health and Mental Health Services Research. 33:2–15.
57. Perini, S., Titov, N. and Andrews, G (2008). The climate sadness program of internet-based treatment for depression: a pilot study. *E-J. Appl. Psychol*. 4:18–24.
58. Richards, D. and Richardson, T (2012) Computer-based psychological treatments for depression: a systematic review and meta-analysis. *Clin Psychol Rev*. 32: 329–342.
59. Riley S and Veale D (1999). The internet and its relevance to cognitive behavioural psychotherapists. *Behav Cognit Psychother.* 27: 37-46.
60. Roy-Byrne P, Craske MG, Sullivan G, Rose RD, Edlund MJ, Lang AJ, Bystritsky A, Welch SS, Chavira DA, Golinelli D, Campbell-Sills L, Sherbourne CD and Stein MB (2010). Delivery of evidence-based treatment for multiple anxiety disorders in primary care: a randomized controlled trial. JAMA. 303: 1921-1928.
61. Rozental, A., Andersson, G., Boettcher, J., Ebert,D.D., Cuijpers, P., Knaevelsrud, C., . Carlbring, P. (2014). Consensus statement on defining and measuring negative effects of Internet interventions. *Internet Interventions*, 1: 12–19.
62. Rozental, A., Boettcher, J., Andersson, G., Schmidt, B. and Carlbring, P (2015) Negative Effects of Internet Interventions: A Qualitative Content Analysis of Patients' Experiences with Treatments Delivered Online. *Cognitive Behaviour Therapy*, 44(3):223-236
63. Sholomskas DE, Syracuse-Siewert G, Rounsaville BJ, Ball SA, Nuro KF and Carroll KM (2005). We don't train in vain: a dissemination trial of three strategies of training clinicians in cognitive-behavioral therapy. *J Consult Clin Psychol*, 73: 106-115.
64. Stallard P, Richardson T and Velleman S (2010). Clinicians' attitudes towards the use of computerized cognitive behaviour therapy (cCBT) with children and adolescents. *Behav Cogn Psychother*. 38:545–60.
65. Terry, N. (2002). "The legal implications of e-therapy". In *E-therapy: Case studies, guiding principles, and the clinical potential of the Internet*, Edited by: Hsiung, R. 166–193. New York: W.W. Norton.
66. Titov N, Andrews G, Johnston L, Robinson E and Spence J (2010). Transdiagnostic Internet treatment for anxiety disorders: a randomized controlled trial. *Behav Res Ther*, 48: 890-899.

67. Topooco, N., Riper, H., Araya, R., Berking, M., Brunn, M., Chevreul, K., Cieslak, R., Ebert, D., Etchmendy, E., Herrero, R., Kleiboer, A., Krieger, T., Gracia-Palacios, A., Cerga-Pashoja, A., Smoktunowicz, E., Urech, A., Vis, C and Andersson G (2017). Attitudes towards digital treatment for depression: An european stakeholder survey. *Internet Interventions.* 8:1-9.
68. Twomey C, O'Reilly G, Byrne M, Bury M, White A and Kissane S, (2014). A randomized controlled trial of the computerized CBT programme, MoodGYM, for public mental 344 A Fresh Look at Anxiety Disorders health service users waiting for interventions. *Brit J Clin Psychol/the British Psycho- logical Society*. 53(4):433-50
69. Üstün T, Ayuso-Mateos JL, Chatterji S, M C and Murray CJ (2004). Global burden of depressive disorders in the year 2000. *Br J Ps.. ..atry*, 184:386-92.
70. U.S Department of Health and Human Services. Https://www.mentalhealth.gov/what-to-look-for/mood-disorders/depression/index.html.
71. van Ballegooijen W, Riper H, Klein B, Ebert DD, Kramer J and Meulenbeek P (2013). An Internet-based guided self-help intervention for panic symptoms: randomized control- led trial. *J Med Internet Res.* 15(7):e154.
72. van der Vaart, R., Riper, H., Witting, M., Kooistra, L., Bohmeijer, E and Gemert-Pijnen (2014). Blending online therapy into regular face-to-face therapy for depression: content, ratio and preconditions according to patients and therapists using Delphi study.*BMC Psychiatry*
73. Waller G (2009). Evidence-based treatment and therapist drift. *Behav Res Ther*, 47: 119-127.
74. Waller, R and Gilbody, S (2009). Barriers to the uptake of computerized cognitive behavioural therapy a systematic review of the quantitative and qualitative evidence. *Psychological Medicine*, 39, 705–712.
75. Weitz, P (2015). e-Beratung: Online Counselling and Psychotherapy –the challenge for the next ten years, let's dare together. *e-beratungsjournal.net*
76. Williams, A., O'Moore, K., Mason, E and Andrews, G (2014). The effectiveness of internet cognitive behaviour therapy (iCBT) for social anxiety disorder across two routine practice pathways. *Internet Intervent.* 1(4):225-9.
77. World Health Organization (2004). Prevention of mental disorders: Effective interventions and prevention of mental disorders: Effective interventions and policy options. Geneva World Health Organization.
78. Ye Y., Zhang, Y., Chen, J., Li, X., Liu, Y., Lang, Y., Lin, L., Yang, X. and Jiang, X (2015). Internet-Based Cognitive Behavioral Therapy for Insomnia (ICBT-i) Improves Comorbid Anxiety and Depression—A Meta-Analysis of Randomized Controlled Trials. *PLOS ONE.* 10(1): 1-11.
79. Young, K.S (2005). An empirical examination of client attitudes towards online counselling. *Cyberpsychol Behav*, 8(2):172-7.
80. YFriesen, L., Hadjistavropoulos, H. and Pugh, N (2014). A qualitative examination of psychology graduate students' experiences with guided Internet-delivered cognitive behaviour therapy 1(2):41-48.

Appendix 1— Meta-analysis of different iCBT programs.

Author, date	Main outcomes. Key points	Focus group Age (Reason)	Program used	Depression Measurement Tools	Further recommendation	Limitations
Internet-based CBT for social phobia and panic disorder in a specialised anxiety clinic in routine care: Results of a pilot randomised controlled trial [49].	The comparison showed no statistical significant differences between the intervention and the control groups as proven by intention-to-treat linear regression analysis (ITT) on the primary measure of symptoms of anxiety (BAI) as well as the secondary outcome measure of symptomatic levels of depression (BDI-II).	Adult population (mean age of 30.81 for both the intervention and the control group). Its effectiveness were previously proven via RCT methods by two different set of researchers [46].	FearFighter (FF)	BAI: Beck Anxiety Inventory; BDI-II: Beck Depression Inventory II; EQ-VAS: EuroQol visual analogue scale.	A large scale fully powered RCT, using FF is recommended.	The insignificance in FF treatment can be related to study lack of power. Also, only 11 out of final 67 participants completed the whole sessions of FF. Participants' attitude toward FF seemed to be a mere preparatory assessment for the real treatment,— perhaps face-to-face treatment

Internet-delivered cognitive behaviour therapy for anxiety and insomnia in a higher education context [52].	Both programs proved effective at alleviating relative target symptoms; Insomnia Relief: positive for sleep quality improvement. Anxiety Relief: reduced anxiety; moderate effect to reducing insomnia symptoms Transfer gains: programs had positive effective on the opposite relative target symptoms.	18- 34. Study was confined to only undergraduate student population of the University of Bristol	Commercia lly available programs – "Insomnia Relief" and "Anxiety Relief	State-Trait Anxiety Inventory-state (STAI-S) The Pittsburgh Sleep Quality Index (PSQI) The Beck Depression Inventory – second edition (BDI-II) Intention-to-treat ITT) analyses	Coming up with a iCBT naturalistic design program that can be accessed remotely and freely (no participation fee), by the entire students from their university's webpages; No need to contact the research team for access Multiple follow-ups needed to track the level of symptomology improvement over time.	Some students neither failed to stay until the minimum duration specified nor completed the post-intervention measure plan thus undermined the study The programs were unguided, producing small rather than medium effect size. Also, therapist solely input was sending text messages reminder No follow-ups; post-intervention period symptom levels were not ascertained.

Improving adherence and effectiveness of computerised cognitive behavioural therapy without support for depression: A qualitative study on patient experiences [21].	CYL: negative treatment effect on patients with depressive symptoms. Main Barriers included: Lack of identification with and applicability of iCBT-CYL; non-adherence due to no guidance; Inadequate computer/Internet skills, equipment, or location. Motivators: therapy convenience	18-65	Colour Your Life (CYL)	Beck's Depression Inventory (BDI)	Comparison should be made between supported and unsupported iCBT; The effects adding support endangering the appealing aspects of iCBT should be considered in further studies. Both additional professional and lay supports cum good working computer condition could improve iCBT	Study design; Limited iCBT knowledge of the subjects; Confusion about treatment aspects (confusion between questionnaire and iCBT)

The impact and utility of computerised therapy for educationally alienated teenagers: The views of adolescents who participated in an alternative education-based trial [20].	Comparison of the views of adolescents attending alternative education (AE) programmes who participated in a trial of iCBT (SPARX) compared with those that were delayed. All participants' perspective were similar SPARX was considered helpful and fun. iCBT was considered empowering and convenient.	13-16 Study was aimed to gather the views of adolescents attending alternative education (AE) programmes	SPARX	Children's Depression Rating Scale scores. Interview findings were analysed using a general inductive analysis.	iCBT should be offered universally in alternative education and similar programmes.	Social desirability bias as participants were aware they were interviewed by one of the major application developer

Patient experience of computerised therapy for depression in primary care [39].	Majority of patients were ambivalent about the therapy. The study was able to examine barriers and facilitators to engagement within the context of the REEACT trial, the largest independent study to date of computerised therapy. Participants shared both their negative and positive views of iCBT having received one of the two programmes, and its delivery method in routine primary care.	29-69	MoodGym and Beating the Blues	PHQ REEACT RCT	Antidepressant and clinical guidance should be added to support iCBT. Its delivery should fit the patient's. Programmes should be improved to provide users with a more positive experience and to exploit the potential for greater personalisation of content to encourage adherence. iCBT should be user friendly and cost effective	Participants were majorly White British and research is needed to explore the perspectives of other populations. Patients who would struggle most with cCBT may not have agreed to take part in the trial and so their views may be neglected.