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Adherence to the iFightDepression® online self-help tool for depression – A pilot study

Anna VARGA¹ , Edit CZEGLÉDI¹ , Kálmán ERDÉLYI² ,
Szilvia GYÖMBÉR³ , Noémi SZEIFERT⁴ , Mónika Ditta TÓTH¹ ,
György PUREBL¹

¹Semmelweis University, Department of Behavioral Studies, Budapest

²National Sports Health Institute, Clinical Psychology and Psychiatry Center, Budapest

³Bács-Kiskun County Hospital, Kecskemét

⁴Eötvös Loránd University, Department of Clinical Psychology and Addictology, Budapest

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Adherencia az iFightDepression® online önségítő programban – Pilot-vizsgálat

Varga A; Czeplédi E, PhD; Erdélyi K, MD, PhD;
Gyömbér Sz, MD; Szeifert N; Tóth D, MD, PhD;
Purebl Gy, MD, PhD

Correspondent:

Anna VARGA,
Semmelweis University,
Department of Behavioral
Studies;
1082 Budapest, Üllői út 66/B/II
Telefon: +36709401366,
e-mail: anna.varga@comitel.hu
<https://www.orcid.org/0000-0001-5362-5352>

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Background and purpose – The aim of the current observational study was to examine the level of adherence of Hungarian patients suffering from depression, using iFightDepression® (iFD®) guided online self-help tool with and without an extra weekly phone call support as well as identifying the predictors of adherence. Our hypotheses were: the additional weekly phone-calls would increase the adherence with the online self-help tool; furthermore, symptoms of depression will significantly decrease in the weekly phone support group.

Methods – During the 6 weeks of iFD® intervention, patients were divided into two groups: the first, alongside of the treatment as usual (TAU) and iFD®, received a 20-minute weekly phone call support while the other group partook in only the TAU+iFD® intervention. Measures: number of completed modules and Patient Health Questionnaire-9. The study included 102 participants with diagnosis of depression (70% female, mean age: 36.9 [SD = 11.40] ys).

Results – Participants completed on average 4.8 (SD = 1.73) out of 6 modules. The intervention group with additional phone support completed more modules than the group of no additional phone calls ($Z = -5.416$, $p < 0.001$, rank Cohen's $d = -1.267$). Participants with higher level of education completed more modules than those with lower level of education ($Z = -2.198$, $p = 0.028$, rank Cohen's $d = -0.444$). Baseline depressive symptoms correlated negatively with the number of completed modules ($r_s = -0.22$, $p = 0.028$). Depressive symptoms were significantly re-

Háttér és cél – Tanulmányunk célja az iFightDepression® (iFD®) online önségítő programban az adherencia mértékének vizsgálata heti kiegészítő telefonos segítséggel és a nélkül, valamint az adherencia prediktorainak beazonosítása. Hipotéziseink: a kiegészítő heti telefonos segítség növeli az online önségítő beavatkozással való adherenciát, valamint a heti telefontámogatásban részesülő csoport depressziós tünetei az intervenció hatására szignifikánsan csökkennek.

Módszerek – A hat hétig tartó iFightDepression® intervenció előtt a pácienseket két csoportra osztottuk: az egyik a hagyományos (TAU) kezelés és az iFD® mellett heti 20 perces kiegészítő telefonos támogatásban részesült, a másik csak TAU és iFD® beavatkozást kapott. Mérészközök: az elvégzett modulok száma és Patient Health Questionnaire-9. A mintát 102 páciens alkotta (70% nő, átlagéletkor: 36,9 [SD = 11,40] év).

Eredmények – A résztvevők a program 6 moduljából átlagosan 4,8 (SD = 1,73) modult végeztek el. A kiegészítő telefonos segítségben részesülő csoport szignifikánsan több modult teljesített ($Z = 5,416$, $p < 0,001$, rang Cohen- $d = -1,267$). A magasabb iskolai végzettséggel rendelkezők szignifikánsan több modult végeztek el, mint az alacsonyabb iskolai végzettségűek ($Z = -2,198$, $p = 0,028$, rang Cohen- $d = -0,444$). A kiinduláskor mért depressziós tünetek súlyossága negatívan korrelált az elvégzett modulok számával (Spearman $\rho = -0,22$, $p = 0,028$). A két mérési pont között a depresszív tünetek szignifikánsan csökkentek (az ismétlés főhatása:

duced between the two measurement points (main effect of time: $F(1) = 179.173$, $p < 0.001$, partial $\eta^2 = 0.642$), the improvement was significantly larger in the iFD® + phone support group (time $\times$ group interaction: $F(1) = 6.492$, $p = 0.012$, partial $\eta^2 = 0.061$).

Conclusion – Weekly phone support increased treatment adherence. Negative correlation of symptom severity with adherence suggests that iFD® can be effective in mild or moderate forms of depression. With regards to sociodemographic variables, only the level of education showed significant correlation with adherence. Our results support applicability of the iFD® intervention in various kinds of sociodemographic groups.

Keywords: depression, internet-based intervention, cognitive behavioral therapy, iFightDepression®, adherence

$F(1) = 179.173$, $p < 0.001$, parciális $\eta^2 = 0.642$), a tünetek javulása szignifikánsan nagyobb mértékű volt az iFD® + telefonos csoportban, (ismétlés $\times$ csoport interakciója: $F(1) = 6.492$, $p = 0.012$, parciális $\eta^2 = 0.061$).

Következtetés – A heti kiegészítő telefonos segítség növelte a beavatkozáshoz kapcsolódó adherenciát. A depressziós tünetek súlyossága és az adherencia közötti negatív korreláció azt sugallja, hogy az iFightDepression® enyhe vagy közepesen súlyos depresszió esetén hatékony. A szociodemográfiai változók közül egyedül az iskolai végzettség mutatott szignifikáns összefüggést az elvégzett modulok számával. Eredményeink alátámasztják az iFD® intervenció változatos szociodemográfiai csoportokban történő alkalmazhatóságát.

Kulcsszavak: depresszió, internetalapú intervenció, kognitív viselkedésterápia, iFightDepression®, adherencia

Depressive disorders are recognized as one of the most widespread lifetime difficulties and unipolar depression is identified as a leading cause of disease burden^{1,2}. These findings justify the importance of reducing depressive symptoms by implementing cost-effective interventions. Despite the fact, that cognitive behavior therapy (CBT) is an effective treatment for depression^{3,4}, mental health care resources are scarce and cannot satisfy the need for face-to-face psychotherapeutic treatments^{5,6}.

The term ‘low-intensity psychological interventions’ (LIPI) has been used since the beginning of this century and it means that the mental health professional’s time is used in a cost-effective way⁷. In other words, it is a way of increasing access to effective treatments for every sector of society. LIPI can be a self-help book, large group education classes, advice clinics and recently the most popular are the internet-based psychotherapeutic interventions⁸.

As an evidence-based psychological intervention, cognitive behavior therapy (CBT) is currently one of the most dominant and effective models in the world of psychotherapies. It consists of techniques that help people think in more functional and helpful way about themselves, the world and other people. This then helps to ameliorate symptoms of anxiety and depression. The internet enables prevention and early intervention programs to be offered on a massive scale⁸. Thus, an increasing number of internet-based cognitive behavioral therapies (iCBT)

is to improve access to psychological treatments, reduce waiting lists, speed up clinical recovery and bridge the paucity of specialists in small towns^{9,10}. Moreover, guided web-based self-help interventions are cost-effective and timesaving for mental health care systems^{11,12,13} and numerous studies have shown the iCBT to be effective in decreasing symptoms of depression as well^{4,14}. According to Krebs and Duncan¹⁵, depression-related digital applications are one of the most downloaded contents by the public.

Nevertheless, high drop-out rate is a common limitation of online self-help interventions. In clinical studies drop-out varies between 57 to 74% or higher^{16,17} depending on the technology, offered value, resources and type of human support. In the comparison of drop-out rates of different psychological treatments, no difference has been found between face-to-face and web-based interventions¹⁸. Previous research has found that the drop-out risk from iCBT is significantly correlated with gender, level of education and age. Increased drop-out risk included male, younger age, and lower educational level¹⁹.

Treatment adherence, defined as the amount of a therapeutic intervention that an individual engages with or completes^{19,20}, has clear clinical implications, for example, high adherence predicts symptom reduction^{21,22}. However, adherence is dependent on a number of factors.

With regards to gender, females were found to have significantly higher engagement with online self-help in-

interventions compared to males^{23, 24}. Lower level of education might negatively influence the adherence to iCBT, as understanding the content of interventions can be troublesome^{19, 23}. It appears that younger individuals exhibited a higher adherence to web-based treatment²⁵, while some other studies showed that younger age was related to low treatment adherence^{18, 24}.

Facilitating appropriate adherence may be essential for increasing the effectiveness of web-based intervention programs. Results of systematic reviews showed that in web-based self-help treatments extra support spurs higher adherence than no guidance at all^{26, 27}. Several findings also suggest that additional forms of guidance or support via phone or email increase the level of adherence^{28–30}. Offering web-based treatment to patients with the most benefits come with the necessity of identifying the predictors of treatment adherence and the causes of a relatively high dropout rate.

This study aimed to investigate predictors of adherence to iFightDepression®, a computerized guided self-help CBT tool for depression. Furthermore, our goal was to compare adherence in the web-based intervention with and without a weekly phone call as additional support. We hypothesised that in the group receiving phone support, the level of adherence would be higher compared to the group not receiving additional weekly phone calls. Our second hypothesis was that depressive symptoms will ameliorate more in the group receiving phone calls compared to the group without such extra support.

Method

Study design

In this observational study the iFightDepression® (iFD®) online self-help tool was assessed in terms of adherence. The tool was used by Hungarian patients suffering from mild or moderate forms of depression. The trial is preregistered with ClinicalTrials.gov (NCT04363086). The study protocol was approved by the Regional Research and Ethics Committee at Semmelweis University Budapest – TUKEB (registration number: SE TUKEB 5/2017).

Participants and procedure

Participants were recruited via face-to-face contact from mental healthcare facilities by trained general practitioners and mental health professionals (psychiatrists, clinical psychologists, psychotherapists) across Hungary. Participants were also informed about the study in written form.

Prior to recommending the iFD® tool to their patients, professionals took part in a 3-hour training including information about the epidemiology, symptoms and

screening methods of depression as well as the use of the tool. The training introduced the core modules of the tool and trained the participating professionals to guide their patients through the iFD® tool. They were also trained in basics of CBT, and introduced to the technique of cognitive restructuring. For the eligibility of participating in the study, trained health care professionals clinically assessed patients with depression based on the diagnostic system of ICD-10³¹.

The inclusion criteria for participating in the study for patients were: 1) meeting the requirement of the ICD-10 Classification of Mental and Behavioural Diseases indicating minimum to mild depression; 2) having had a mild, moderate or mildly severe depressive episode for at least in the past 6 months; 3) >4 scores on the Patient Health Questionnaire-9; 4) aged between 18 to 65; 5) having none of the following severe psychiatric disorders based on the clinical assessment of the mental health professional: bipolar disorder, obsessive-compulsive disorder, schizophrenia, alcohol or drug addiction, acute suicidal tendencies; 6) internet access at home. Before entering the study, all participants were provided with informed consent forms and information about the aims of the study, the benefits and risks of participation, and the study procedure. Neither the professionals nor the patients received any financial compensation for participating in the study.

Participants were assigned to one of the two following groups: 1) iFD® or 2) iFD® + weekly phone calls aiming to support the use of the self-help tool. Phone calls were provided by a clinical psychologist certified in CBT; calls lasted 15–20 minutes. Since iFD® is a complementary tool to a regular psychological or psychiatric treatment, all patients included in the study were participating in an ongoing treatment as usual (TAU). Treatment as usual was either a pharmacological treatment, a psychotherapeutic treatment, or both. Participants were required to complete 1 module per week to finish the online self-help tool in 6–8 weeks. The assessment was conducted before (Time 1: week 0) and after the iFD® intervention (Time 2: week 6–8).

Due to the lack of funding and their busy schedule, finally only 12 professionals participated in our project, who recruited a total of 163 participants. Of the potential subjects, 46 individuals (12 men and 34 women) who did not undertake participation in the iFD® program were excluded. Additional 10 individuals (4 men and 6 women) who did not receive treatment for their depression at the beginning of the study were excluded as well. A woman who was treated with an unconventional treatment (art therapy) for her depression at baseline was also excluded. Furthermore, we excluded a man who lacked some data in the PHQ-9 in both measurements, and 6 subjects (6 women) with a PHQ-9 value of up to 4 points at baseline.

The final sample consisted of 102 participants (31 male and 71 female). The mean age was 36.9 years (SD = 11.40 years, range: 18–63 years). Based on clinical assessment of the mental health care providers, 3% of participants received a diagnosis of mild depression, 56.9% moderate, and 6.9% severe depression. Although mental health professionals were instructed to recommend the iFD® online self-help tool for patients with mild to moderately severe depression, some of them found the tool to be useful for some patients with moderately severe depression ($n = 7$), who were found to be motivated to try anything to alleviate their symptoms, therefore, we haven't excluded them from the sample.

Patients were assigned in a non-randomized way in a sequential manner to one of two intervention groups mentioned above: 1) iFD® = 52 participants or 2) iFD® + Phone call support = 50 participants. Every second participant was assigned to phone call support. The assignment was blind to the participants and health care professionals as well. The characteristics of the sample are described in detail in **Table 1**. We found a significant difference between the two groups in terms of gender alone: there were a higher proportion of men in the group with phone support than in the group without phone support.

Intervention

The iFightDepression® (iFD®) online self-help tool is a low-intensity psychological intervention created by the European Alliance Against Depression (EAAD). It is a free of charge guided program for people suffering from mild forms of depression, based on CBT interventions. The iFD® tool is designed to complement conventional treatments like pharmacological or psychotherapy. The guidance is offered by a mental health professional or GP. Currently, the iFD® program is available in 15 languages worldwide. The tool is a 6-week program where 6 workshops are provided each for a week. It is designed to be used on any device with web access. The modules in iFD® are as follows: 1. Relationship Between Thinking, Feeling and Behaviour; 2. Sleep and Depression; 3. Planning and Doing Enjoyable Things; 4. Getting Things Done (Behavioural Activation); 5. Identifying Negative Thoughts; 6. Changing Negative Thoughts. Each module consists of a short, written psychoeducational introduction to its topic and worksheets that elaborate the subject in practice. The user is encouraged to complete the modules at a rate of one per week, with an estimated 30–40 minutes for each. Mental health professionals or GPs meet the patient face-to-face maximum 3 times during the 6-week iFD® intervention for 10–15 minutes in order to discuss any questions patients might have regarding the modules of the tool³². The iFD® program generates an automated motivational e-mail if the patient does not sign in for two

weeks; in addition, it automatically records the number of completed modules.

Supportive weekly phone calls were provided by a clinical psychologist certified in CBT (first author). The phone call support focused on guiding patients through each module within the tool, discussing questions that they had, and motivating them to work through the homework assignments. Each phone call lasted about 20 minutes per week for each patient.

Measures

Sociodemographic and mental health data were collected in paper and pencil before and after the iFD® intervention by the health professionals who provided patients with TAU.

Sociodemographic data: gender, age, level of education and place of residence.

Mental health data: Prior to existing depression, other mental health diagnoses were recorded (coded with “yes” or “no” answers). Mental health professionals and GPs were asked to record their clinical assessment of the patient's level of depression. Possible responses were a) no depression; b) mild depression; c) moderate depression; d) severe depression.

Participants completed the *Patient Health Questionnaire-9* (PHQ-9)³³. The 9-item self-reported questionnaire is a multipurpose instrument for measuring the severity of depression. It is the most commonly used self-administered screening tool for measuring the severity of depression in primary care^{34,35}. Items of the PHQ-9 represent symptoms of depression as defined by both the DSM-IV and the DSM-5³⁵. Respondents rate how often they experienced each depression-related symptom in the past two weeks on a four-point Likert scale (from “not at all” (0) to “nearly every day” (3)). PHQ-9 scores of 5, 10, 15, and 20 represent respectively mild, moderate, moderately severe, and severe depression. In the present sample, the internal consistency of both pre and post measurement points on the scale were acceptable (Cronbach's alpha: 1st measure: 0.712; 2nd measure: 0.704).

Completed iFD® modules. In this study, adherence is defined by the number of completed intervention modules. Out of six core iFD® modules, the number of completed ones by each participant is registered automatically by the tool.

Statistical analysis

Two missing data on the PHQ-9 were replaced by the twin (nearest neighbour) method. For estimating the internal consistency of the PHQ-9, Cronbach's alpha was used.

To compare the groups, independent samples *t*-test, Mann–Whitney *U*-test, Kruskal–Wallis test, and Chi-square tests were conducted. As effect size indicators, we

Table 1. *Characteristics of the sample*

Variables		Total sample (N = 102)	iFD® (N = 52)	iFD®+Phone (N = 50)	Group comparisons
Gender	Male	31 (30.4%)	11 (21.8%)	20 (40.0%)	$\chi^2(1) = 4.280$ $p = 0.039$ Cramér's $V = -0.205$
	Female	71 (69.6%)	41 (78.8%)	30 (60.0%)	
Age (years) M (SD)		36.9 (11.40)	35.9 (11.14)	37.9 (11.68)	$Z = -0.814$ $p = 0.416$ rank Cohen's $d = -0.161$
Education level	Up to medium level	50 (49.0%)	29 (55.8%)	21 (42.0%)	$\chi^2(1) = 1.934$ $p = 0.164$ Cramér's $V = 0.138$
	High level	52 (51.0%)	23 (44.2%)	29 (58.0%)	
Place of residence	Capital	51 (50.0%)	25 (48.1 %)	26 (52.0%)	$\chi^2(1) = 0.157$ $p = 0.692$ Cramér's $V = -0.039$
	Countryside	51 (50.0%)	27 (51.9%)	24 (48.0%)	
Depression prior to the study	Yes	82 (80.4%)	42 (80.8%)	40 (80.0%)	$\chi^2(1) = 0.010$ $p = 0.922$ Cramér's $V = -0.010$
	No	20 (19.6%)	10 (19.2%)	10 (20.0%)	
Other psychiatric diagnosis before	Yes	56 (54.9%)	30 (57.7%)	26 (52.0%)	$\chi^2(1) = 0.334$ $p = 0.564$ Cramér's $V = -0.057$
	No	46 (45.1%)	22 (42.3%)	24 (48.0%)	
Current depression	Mild	37 (36.3%)	16 (30.8%)	21 (42.0%)	$\chi^2(2) = 2.199$ $p = 0.333$ Cramér's $V = 0.147$
	Moderate	58 (56.9%)	31 (59.6%)	27 (54.0%)	
	Moderately-Severe	7 (6.9%)	5 (9.6%)	2 (4.0%)	
PHQ-9 M (SD)	Time 1	13.6 (4.58)	14.3 (4.91)	12.9 (4.15)	$t(100) = 1.475$ $p = 0.143$ Cohen's $d = 0.292$
Current treatment of depression	Pharmacotherapy	37 (36.3%)	23 (44.2%)	14 (28.0%)	$\chi^2(2) = 2.923$ $p = 0.232$ Cramér's $V = 0.169$
	Psychotherapy	42 (41.2%)	19 (36.5%)	23 (46.0%)	
	Both	23 (22.5%)	10 (19.2%)	13 (26.0%)	

used Cohen's d , rank Cohen's d , rank eta-square (η^2) and Cramér's- V , respectively. Linear relationships were tested by Spearman's rank correlation analysis. Change in depression measured by the PHQ-9 was examined by a two-way mixed ANOVA.

Data analysis was performed by SPSS 21.0 and ROP-stat³⁶, statistical program packages.

Results

Predictors of adherence

As mentioned above, adherence has been operationalized by the number of completed modules in the iFD® tool. The mean of completed modules was 4.8 (SD = 1.73, range: 1–6).

Figure 1 shows the frequency of modules completed by the participants. Participants in the group with additional phone support completed significantly more modules ($M = 5.8$, $SD = 0.72$) than the group without phone support ($M = 3.9$, $SD = 1.94$, $Z = -5.416$, $p < 0.001$, rank Cohen's $d = -1.267$). All modules were completed by 88.0% of the group receiving phone calls, while among those not receiving telephone support this proportion was only 38.5%.

We examined the relationship between number of completed modules and the socio-demographic characteristics of the sample, namely gender, age, level of education, and place of residence. Number of completed modules did not show significant relationship with either gender ($Z = 0.991$, $p = 0.322$, rank Cohen's $d = 0.213$), age ($r_s = -0.14$, $p = 0.165$), or place of residence ($Z = 1.213$, $p = 0.225$, rank Cohen's $d = 0.241$). On the other hand, those with a higher level of education completed significantly more modules ($M = 5.2$, $SD = 1.54$) than those with up to secondary education ($M = 4.5$, $SD = 1.85$, $Z = -2.198$, $p = 0.028$, rank Cohen's $d = -0.444$).

With regards to severity of depressive symptoms, our results show a weak, negative relationship between depressive symptoms measured by the PHQ-9 questionnaire at baseline and the number of modules completed ($r_s = -0.22$, $p = 0.028$).

The type of current treatment of depression (i.e., pharmacotherapy, psychotherapy, or both) also did not show a significant association with the number of modules completed ($H(2) = 0.002$, $p = 0.999$, rank $\eta^2 = 0.000$).

Changes in symptoms of depression

According to the results of the two-way mixed ANOVA, there is a significant reduction in depressive symptoms between the two measurement points (main effect of time: $F(1) = 179.173$, $p < 0.001$, partial $\eta^2 = 0.642$). For members of the telephone support group, the improvement was significantly greater than for those not receiving phone calls (main effect of group: $F(1) = 10.812$, $p = 0.001$, partial $\eta^2 = 0.098$; time $\times$ group interaction: $F(1) = 6.492$, $p = 0.012$, partial $\eta^2 = 0.061$) (**Figure 2**).

Discussion

The aims of the present study were to examine predictors of adherence to an internet-based, self-help CBT tool for depression and to test whether the additional phone sup-

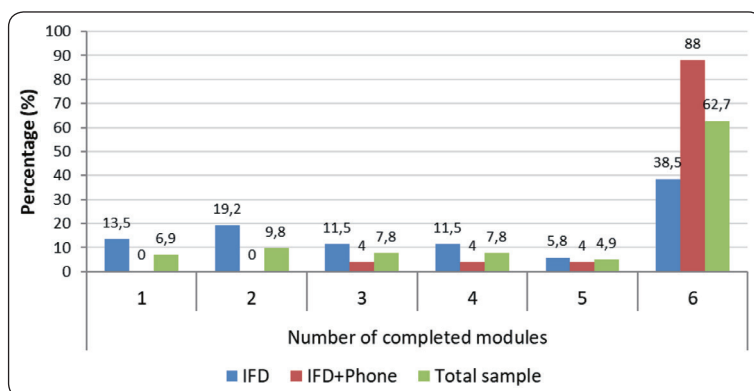


Figure 1. Frequency of completed modules in the two intervention groups

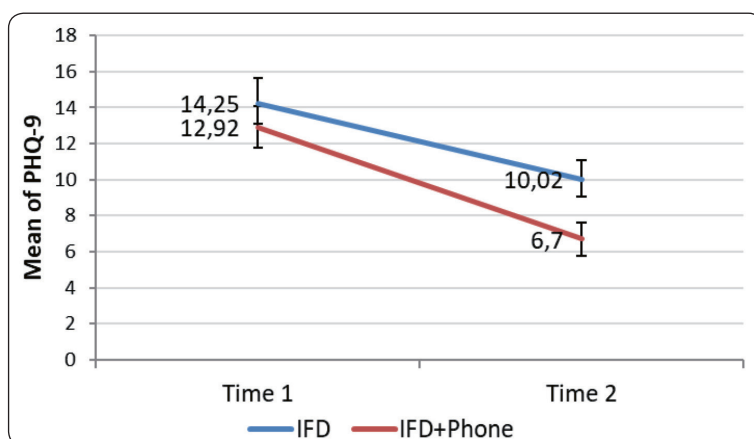


Figure 2. Changes in symptoms of depression in the two measurement points

Note: Error bars represent the 95% confidence interval of means.

port substantially increased engagement with the tool and resulted in improved outcomes. The iFD® tool is intended to complement the available approaches for clinicians regarding the management and treatment of depression as an adjunct therapy offered to patients³². However, the iFD® tool is also intended to be used as a single resource for an individual when access to psychological treatment is restricted; for example, to reduce wait times for face-to-face psychotherapy, or when patients receive pharmacotherapy only.

The main finding of this study is that adherence was much higher (88%) if a mental health professional provided a weekly 15–20-minute phone call during the 6-week intervention. Treatment adherence in the group without the weekly phone calls, on the other hand, was only 38.5%.

Additionally, depressive symptoms significantly decreased in both groups, however, in the group with phone support, the improvement of symptoms was significantly higher. This data is in line with results of previous studies where participants receiving additional weekly support along an iCBT showed higher symptom improvement^{37, 38}.

With regards to the severity of depressive symptoms,

our results show a weak negative relationship between depressive symptoms measured by the PHQ-9 questionnaire at baseline and the number of completed modules ($r_s = -0.22, p = 0.028$).

With regards to sociodemographic factors, we found that only the level of education had a significant correlation with treatment adherence. Contrary to several previous studies^{23, 24, 30}, our results do not exhibit a significant correlation between adherence on the one hand, and age and gender on the other. Place of residence didn't correlate with adherence either. These findings suggest that the iFD® program could be beneficial for a relatively wide variety of patient groups.

The results of our study suggest that a weekly phone call may boost the effect of an online self-help tool for depression. According to the clinician providing the phone calls, patients needed more help in clarifying the 5th and 6th modules related to identifying and restructuring cognitive distortions. It might mean that each module may require a different amount of professional support. Although this would mean more engagement of professionals, it seems that the “multi-channeled” (personal, phone call, internet-based) support for patients is beneficial and may help to cope with symptoms better. Research shows that support by nurses, research coordinators, and administrative staff might be as effective as support provided by a mental health professional^{16, 39}. However, the question remains whether upgraded, possibly more interactive, iCBT material would compensate for a weekly need for professional support. Theoretically, there are various methods for upgrade, most of which are already employed in e-mental health. Incorporated videos⁴⁰ for example, serious games that explain the patterns of depressive thinking and give behavioral clues to overcome it on a skills development gaming basis. These features may better correspond with the users' needs and therefore could be a competent surrogate for professional help.

Strengths and limitations

The strength of this study is the contribution to the growing body of evidence-based research of the worldwide implemented iFightDepression® guided online self-help tool. It also contributes to distinguishing the role of adherence to effectiveness of online self-help tools. The importance of online therapy methods has been increased during the Covid-19 pandemic.

With respect to study limitations: first of all, the sampling method limits the generalizability of our findings. Secondly, due to the small sample size, the statistical power could be low. In addition, we did not have a way to use multivariate statistical analyzes that allow the control of potential background variables. Thirdly, in this study, details and effects of treatment as usual – with special interest in which drug has been used for which symptoms –

were not analysed, although it might have had an impact on overall symptom-reduction as well. Further investigation should focus on comparing adherence to iCBT vs. pharmacotherapy in the set of depression symptoms. A fourth limitation of this study is that no randomization was used. Although in this naturalistic, real-life setting in mental health care facilities and GP offices it is more difficult to randomize samples, future research should focus on randomization process as well. The fifth limitation of this study was that improvement was not examined in a follow-up. A future study should have a 3- and 6-month follow-up with patients from both intervention groups.

Conclusions

The findings of our observational, prospective study revealed that patients, using the iFightDepression® guided online self-help tool with additional weekly phone support had a higher adherence compared to patients receiving the usual iFD® protocol without weekly phone calls. With extra phone support delivered by a trained CBT therapist, the effects of iCBT were significantly stronger in reducing depressive symptoms. Although our study had several limitations, we can still draw four important conclusions.

Firstly, despite the fact that it is time limited to 15–20 minutes and delivered via telephone, it demonstrates the power of interactive professional support. Secondly, it demonstrates that on a good intervention foundation (such as iFD®) a minimal, yet well-established, professional intervention (phone call) can boost adherence and efficacy. Future studies are needed to investigate whether a well-trained CBT professional is required to conduct phone calls or a less trained assistant, or nurse can be as effective in supporting patients. Furthermore, the cost-effectiveness of the intervention needs to be evaluated. Thirdly, socio-demographic variables, such as gender, age, and place of residence (rural vs. capital city) had no predictive value in defining adherence rate. Guided iCBT with extra phone support appears to increase the effectiveness of the online self-help tool and mental health facilities, GPs and patients may benefit from its use. And finally, our study demonstrates that TAU can be boosted effectively with additional “non-in-person” measures in the everyday practice of treating individuals with depression. There are several unmet needs considering the conventional treatment of depression^{1, 40, 41}, therefore, all effective additional interventions (especially those that are accessible and affordable) are most welcomed by patients and professionals alike.

AUTHORS CONTRIBUTIONS – Anna Varga – organizing the whole research, presenting the iFightDepression® trainings to professionals, collecting data, contacting patients and professionals, manuscript writing.

Dr. Edit Czeglédi – statistical analyses, manuscript writing.

Dr. Mónika Ditta Tóth – presenting the iFightDepression® trainings to professionals, manuscript writing.

Dr. György Purebl – research supervisor, presenting the iFightDepression® trainings to professionals, manuscript writing.

Dr. Kálmán Erdélyi – data collecting, guiding patients within the iFightDepression® intervention

Dr. Szilvia Gyömbér – data collecting, guiding patients within the iFightDepression® intervention.

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References

- Purebl G, Petrea I, Shields L, Tóth MD, Székely A, Kurimay T, et al. Depression, suicide prevention and e-health: situation analysis and recommendations for action. available: https://ec.europa.eu/health/sites/default/files/mental_health/docs/2017_depression_suicide_ehealth_en.pdf. 2015.
- Kiadaliri AA. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 2018;392:1789–858. [https://doi.org/10.1016/S0140-6736\(18\)32279-7](https://doi.org/10.1016/S0140-6736(18)32279-7)
- Butler AC, Chapman JE, Forman EM, Beck AT. The empirical status of cognitive-behavioral therapy: a review of meta-analyses. *Clin Psychol Rev* 2006;26:17–31. <https://doi.org/10.1016/j.cpr.2005.07.003>
- Cuijpers P, Gentili C. Psychological treatments are as effective as pharmacotherapies in the treatment of adult depression: a summary from randomized clinical trials and neuroscience evidence. *Res Psychother Psychopathol Process Outcome* 2017;20(2). <https://doi.org/10.4081/ripppo.2017.273>
- Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990–2020: Global burden of disease study. *Lancet* 1997;349(9064):1498–504. [https://doi.org/10.1016/s0140-6736\(96\)07492-2](https://doi.org/10.1016/s0140-6736(96)07492-2)
- Lépine JP, Briley M. The increasing burden of depression. *Neuropsychiatr Dis Treat* 2011;7(1):3. <https://doi.org/10.2147/ndt.s19617>
- Bower P, Gilbody S. Stepped care in psychological therapies: access, effectiveness and efficiency. *Br J Psychiatry* 2005;186:11–7. <https://doi.org/10.1192/bjp.186.1.11>
- Bennett-Levy J, Farrand P. Low intensity CBT models and conceptual underpinnings. In: Bennett-Levy J, Richards D, Farrand P, Christensen H, Griffiths K, Kavanagh D, et al. *Oxford Guide to Low Intensity CBT Interventions*. Oxford University Press; 2010. p. 3–18.
- Kenter RMF, Cuijpers P, Beekman A, van Straten A. Effectiveness of a web-based guided self-help intervention for outpatients with a depressive disorder: short-term results from a randomized controlled trial. *J Med Internet Res* 2016;18(3):e4861. <https://doi.org/10.2196/jmir.4861>
- Andrews G, Basu A, Cuijpers P, Craske MG, McEvoy P, English CL, Newby JM. Computer therapy for the anxiety and depression disorders is effective, acceptable and practical health care: an updated meta-analysis. *J Anxiety Disord* 2018; 55:70–8. <https://doi.org/10.1016/j.janxdis.2018.01.001>
- Hedman E, Ljótsson B, Lindfors N. Cognitive behavior therapy via the Internet: a systematic review of applications, clinical efficacy and cost-effectiveness. *Expert Rev Pharmacoecon Outcomes Res* 2012;12(6):745–64. <https://doi.org/10.1586/erp.12.67>
- Kolovos S, van Dongen JM, Riper H, Buntrock C, Cuijpers P, Ebert DD, et al. Cost effectiveness of guided Internet-based interventions for depression in comparison with control conditions: An individual-participant data metaanalysis. *Depression and Anxiety* 2018;35(3):209–19. <https://doi.org/10.1002/da.22714>
- Piera-Jiménez J, Etzelmueller A, Kolovos S, Folkvord F, Lupiáñez-Villanueva F. Guided internet-based cognitive behavioral therapy for depression: Implementation cost-effectiveness study. *J Med Internet Res* 2021;23(5):e27410. <https://doi.org/10.2196/27410>
- Etzelmueller A, Vis C, Karyotaki E, Baumeister H, Titov N, Berking M, et al. Effects of internet-based cognitive behavioral therapy in routine care for adults in treatment for depression and anxiety: Systematic review and meta-analysis. *J Med Internet Res* 2020;22(8):e18100. <https://doi.org/10.2196/preprints.27410>
- Krebs P, Duncan DT. Health app use among US mobile phone owners: a national survey. *JMIR mHealth and uHealth* 2015;3(4):e4924. <https://doi.org/10.2196/mhealth.4924>
- Richards D, Richardson T. Computer-based psychological treatments for depression: a systematic review and meta-analysis. *Clin Psychol Rev* 2012;32(4):329–42. <https://doi.org/10.1016/j.cpr.2012.02.004>
- Torous J, Lipschitz J, Ng M, Firth J. Dropout rates in clinical trials of smartphone apps for depressive symptoms: a systematic review and meta-analysis. *J Affect Disord* 2020;263:413–9. <https://doi.org/10.1016/j.jad.2019.11.167>
- Andersson G, Cuijpers P, Carlbring P, Riper H, Hedman E. Guided Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: a systematic review and meta-analysis. *World Psychiatry* 2014;13(3):288–95. <https://doi.org/10.1002/wps.20151>
- Karyotaki E, Kleiboer A, Smit F, Turner DT, Pastor AM, Andersson G, et al. Predictors of treatment dropout in self-guided web-based interventions for depression: an ‘individual patient data’ meta-analysis. *Psychol Med* 2015;45(13):2717–26. <https://doi.org/10.1017/s0033291715000665>
- Hilvert-Bruce Z, Rossouw PJ, Wong N, Sunderland M, Andrews G. Adherence as a determinant of effectiveness of internet cognitive behavioural therapy for anxiety and depressive disorders. *Behav Res Ther* 2012;50(7–8):463–8. <https://doi.org/10.1016/j.brat.2012.04.001>
- Buntrock C, Ebert DD, Lehr D, Smit F, Riper H, Berking M, Cuijpers P. Effect of a web-based guided self-help intervention for prevention of major depression in adults with subthreshold depression: a randomized clinical trial. *Jama* 2016;315(17):1854–63. <https://doi.org/10.1001/jama.2016.4326>
- Fuhr K, Schröder J, Berger T, Moritz S, Meyer B, Lutz W, et al. The association between adherence and outcome in an Internet intervention for depression. *J Affect Disord* 2018;229:443–9. <https://doi.org/10.1016/j.jad.2017.12.028>
- Castro A, López-del-Hoyo Y, Peake C, Mayoral F, Botella C, García-Campayo J, et al. Adherence predictors in an Internet-

- based Intervention program for depression. *Cogn Behav Ther* 2018;47(3):246-61.
<https://doi.org/10.1080/16506073.2017.1366546>
24. Kazlauskas E, Eimontas J, Olff M, Zelviene P, Andersson G. Adherence predictors in internet-delivered self-help intervention for life stressors-related adjustment disorder. *Front Psychiatry* 2020;11:137.
<https://doi.org/10.3389/fpsy.2020.00137>
 25. Christensen H, Griffiths KM, Farrer L. Adherence in internet interventions for anxiety and depression: systematic review. *J Med Internet Res* 2009;11(2):e1194.
<https://doi.org/10.2196/jmir.1194>
 26. Newman MG, Szokody LE, Llera SJ, Przeworski A. A review of technology-assisted self-help and minimal contact therapies for anxiety and depression: is human contact necessary for therapeutic efficacy? *Clin Psychol Rev* 2011;31(1):89-103.
<https://doi.org/10.1016/j.cpr.2010.09.008>
 27. Karyotaki E, Efthimiou O, Miguel C, Bormpohl FMG, Furukawa TA, Cuijpers P, et al. Internet-based cognitive behavioral therapy for depression: a systematic review and individual patient data network meta-analysis. *JAMA Psychiatry* 2021;78(4):361-71.
<https://doi.org/10.1136/bmjopen-2018-026820>
 28. Wangberg SC, Bergmo TS, Johnsen JAK. Adherence in Internet-based interventions. *Patient Prefer Adherence* 2008;2:57-65.
 29. Ho FYY, Chung KF, Yeung WF, Ng THY, Cheng SKW. Weekly brief phone support in self-help cognitive behavioral therapy for insomnia disorder: relevance to adherence and efficacy. *Behav Res Ther* 2014;63:147-56.
<https://doi.org/10.1016/j.brat.2014.10.002>
 30. Beatty L, Binnion C. A systematic review of predictors of, and reasons for, adherence to online psychological interventions. *Int J Behav Med* 2016;23(6):776-94.
<https://doi.org/10.1007/s12529-016-9556-9>
 31. World Health Organization. The Icd-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines. Geneva: 1992. 9241546530_eng.pdf (1.036Mb)
 32. Arensman E, Koburger N, Larkin C, Karwig G, Coffey C, Maxwell M, et al. Depression awareness and self-management through the internet: protocol for an internationally standardized approach. *JMIR Res Protocols* 2015;4(3):e4358.
<https://doi.org/10.2196/resprot.4358>
 33. Kroenke K, Spitzer RL. The PHQ-9: a new depression diagnostic and severity measure. *Psychiatric Annals* 2002;32(9):509-15.
<https://doi.org/10.3928/0048-5713-20020901-06>
 34. He C, Levis B, Riehm KE, Saadat N, Levis AW, Azar M, et al. The accuracy of the Patient Health Questionnaire-9 algorithm for screening to detect major depression: an individual participant data meta-analysis. *Psychother Psychosom* 2020;89(1):25-37.
<https://doi.org/10.1159/000502294>
 35. Levis B, Benedetti A, Thombs BD. Depression Screening Data (DEPRESSD) Collaboration. Accuracy of Patient Health Questionnaire-9 (PHQ-9) for screening to detect major depression: individual participant data meta-analysis. *BMJ* 2019;365:1476.
<https://doi.org/10.1136/bmj.11476>
 36. Vargha A, Torma B, Bergman LR. ROPstat: a general statistical package useful for conducting person-oriented analyses. *J Person-Oriented Res* 2015;1(1-2):87-98.
<https://doi.org/10.17505/jpor.2015.09>
 37. Pihlaja S, Lahti J, Lipsanen JO, Ritola V, Gummerus EM, Stenberg JH, Joffe G. Scheduled telephone support for internet cognitive behavioral therapy for depression in patients at risk for drop-out: pragmatic randomized controlled trial. *J Med Internet Res* 2020;22(7):e15732.
<https://doi.org/10.2196/15732>
 38. Hadjistavropoulos HD, Schneider LH, Mehta S, Karin E, Dear BF, Titov N. Preference trial of internet-delivered cognitive behaviour therapy comparing standard weekly versus optional weekly therapist support. *J Anxiety Disord* 2019;63:51-60.
<https://doi.org/10.1016/j.janxdis.2019.02.002>
 39. Robinson E, Titov N, Andrews G, McIntyre K, Schwencke G, Solley K. Internet treatment for generalized anxiety disorder: a randomized controlled trial comparing clinician vs. technician assistance. *PloS One* 2010;5(6):e10942.
<https://doi.org/10.1371/journal.pone.0010942>
 40. Feather JS, Howson M, Ritchie L, Carter PD, Parry DT, Koziol-McLain J. Evaluation methods for assessing users' psychological experiences of web-based psychosocial interventions: A systematic review. *J Med Internet Res* 2016;18(6):e181.
<https://doi.org/10.2196/jmir.5455>
 41. Jaffe DH, Rive B, Deneer TR. The humanistic and economic burden of treatment-resistant depression in Europe: a cross-sectional study. *BMC Psychiatry* 2019;19(1):1-11.
<https://doi.org/10.1186/s12888-019-2222-4>