

Strengths-based CBT: Internet-Based Versus Face-to-Face Therapy in A Randomized Controlled Trial

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Abstract

Background: In internet-based cognitive-behavioral therapy, explicitly strengths-based approaches are still missing. The Personal Model of Resilience (PMR) is a positive intervention that utilizes clients' strengths to overcome problems. Up to now, it has only been evaluated in a face-to-face setting. This study aimed to compare the PMR in a guided internet-based setting (I-CBT) against the respective face-to-face intervention (FTF-CBT) and a wait-list control (WLC).

Methods: In a randomized controlled design, FTF-, I-CBT and WLC were compared with respect to dimensions of psychopathology, depression, social anxiety, resilience, quality of life and therapeutic alliance in a sample of $N=94$ college students with psychosocial stress.

Results: Mean effect sizes of I-CBT (Cohen's $d=0.36$) and FTF-CBT ($d=0.61$) exceeded those of WLC ($d=0.26$) with an advantage for FTF-CBT. Also, quality of life was higher in both active intervention groups. Therapeutic alliance was significantly better in the FTF-group.

Conclusion: The PMR can be implemented in an internet-based and face-to-face setting with better outcomes for face-to-face. Researchers and therapists are encouraged to integrate strengths-based approaches into CBT and to explore respective internet-based interventions.

Keywords: Resilience; Internet-therapy; Face-to-face; Cognitive therapy

Introduction

Cognitive-behavioral therapy (CBT) has been shown to be very helpful in a variety of mental disorders [1]. Although CBT in an internet-based setting (I-CBT) is a comparatively new treatment approach, various studies and reviews point to its efficacy in decreasing symptoms of for example depression [2-4], anxiety disorders [5-7], insomnia [8] or posttraumatic stress disorder [9]. Moreover, there is growing evidence for a similar effectiveness of I-CBT compared to face-to-face CBT (FTF-CBT) for a broad variety of psychiatric and somatic disorders [10]. In meta-analyses, guided online interventions with therapist feedback were shown to be superior to unguided internet-based interventions [4,11,12]. Thus, for intervention outcome some form of alliance might be relevant in I-CBT just like in FTF-CBT [13].

The focus of CBT interventions – in FTF- as well as I-CBT – is mostly directed towards the reduction of problem maintaining factors. In contrast, dual models of psychosocial health postulate that health implies the presence of positive mental health in addition to the absence of psychopathology [14]. Thus, the active promotion of positive health factors through respective interventions seems feasible; according to Seligman and Csikszentmihalyi [15], positive interventions are not opposed to problem-oriented approaches, but should rather be seen as a complementary approach that may in itself reduce problem aspects.

In FTF-CBT, there is some evidence that combining CBT and strengths-orientation offers advantages over CBT alone in social anxiety [16], but not in depression [17]. Kuyken, Padesky, and Dudley [18] suggest considering strengths analysis and -intervention as integral parts of individual case conceptualization, the “personal model of resilience” [19] is an intervention module that explicitly targets the use of strengths. Following developmental psychology research, resilience means “to cope and adapt in the face of adversity and/or to bounce back and restore positive functioning” [19]. Drawing on positive psychology

interventions [20] and cognitive therapy, the PMR provides a 4-steps-guide for therapists and patients to:

1. Activate past experiences of resilience.
2. Delineate a personal model of resilience strategies that were useful to overcome past obstacles.
3. Apply those strategies to a problem area.
4. Generalize them to different areas of life.

Unlike other effective resilience interventions that focus on establishing new coping strategies [21], the PMR uses strategies that are already available to an individual. In initial studies, the PMR has been shown to be useful while waiting for a therapy [22] or for student counseling [23] where it was administered in three sessions either as group or individual therapy. With small to large effect sizes on dimensions of psychopathology, self-esteem, optimism and well-being, it seems to have a broad outcome profile.

Student counseling is a relevant field for the use of PMR as the transition to university is a stressful life situation that confronts students with many challenges and obstacles [24,25] and requires flexibility and adaptation. Not surprisingly, Connell, Barkham and Mellor-Clark [26] report that students attending university counseling show

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Received January 25, 2018; Accepted February 07, 2018; Published February 09, 2018

Citation: Victor P, Krug I, Vehoff C, Lyons N, Willutzki U (2018) Strengths-based CBT: Internet-Based Versus Face-to-Face Therapy in A Randomized Controlled Trial. J Depress Anxiety 7: 301. doi:10.4172/2167-1044.1000301

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similar symptoms and levels of distress to students attending primary care in the UK. The high prevalence of mental health problems among students is also reflected in the counseling activities at universities: In 2015, the German student union registered almost 30,000 students with counseling requests at all 58 psychological counseling centers in Germany [27].

Consequently, about 1% of the 2.8 million German students in 2015 [28] made use of university counseling that year. In this critical life phase, resilience has a positive effect on social, psychological and physical dimensions of quality of life [29].

In order to explore the benefits of a resilience intervention in an internet setting, the PMR was implemented online. A guided intervention was chosen to foster participants' commitment as well as a counselor support via written feedback to increase the treatment's efficiency compared to a treatment without interactions [4,8,30]. It comprised an asynchronous communication mode with time-independent text messages over synchronous communication (e.g. telephone or live-chat) due to more flexibility regarding guidance dose [12].

This study aims to explore the efficacy of the PMR as I-CBT compared to FTF-CBT and wait-list control (WLC). Moreover, it

aims to generate new information about resilience-based treatment by measuring the participants' psychopathology, resilience, depression and social anxiety at baseline, post-intervention and three-week follow-up while considering the therapeutic alliance.

Methods

This randomized controlled trial was conducted at Witten/Herdecke University from October 2016 to July 2017. It was approved by the Ethics Committee of Witten/Herdecke University.

Procedure

Counselors were trained prior to the elicitation phase using a guideline based on Padesky and Mooney's PMR [19]. They had at least a bachelor's degree in psychology and were supervised by licensed psychotherapists. All participants gave informed consent and were randomized to one of the three conditions (FTF-, I-CBT and WLC). Measurements were assessed online via Limesurvey three times during the study: The intervention groups were given questionnaires prior to the intervention (pre), after the three-week intervention (post) and after another three weeks of self-practicing (follow-up) (Figure 1). WLC was assessed three times before receiving the intervention with an interval of three weeks between assessments. The intervention

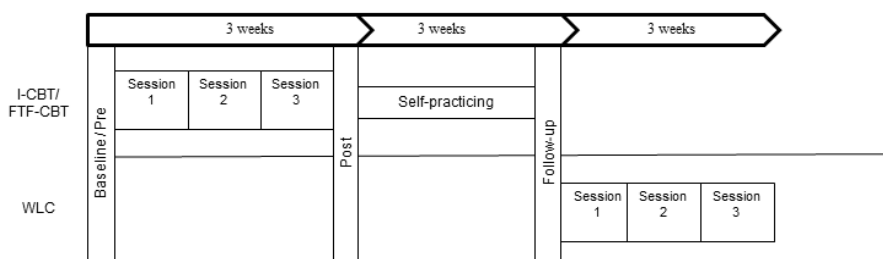


Figure 1: Study procedure including the measuring points pre, post and three-week follow-up as well as the intervention runtime for internet-based CBT (I-CBT), face-to-face CBT (FTF-CBT) and wait-list control (WLC).

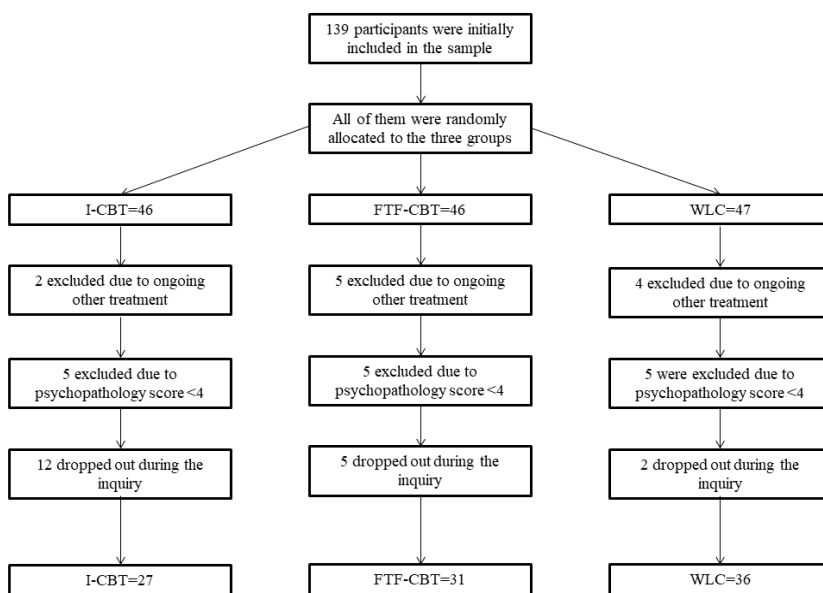


Figure 2: CONSORT flow diagram of the sample size, drop-outs and exclusions for internet-based CBT (I-CBT), face-to-face CBT (FTF-CBT) and wait-list control (WLC). Participants were excluded at baseline if they were currently undergoing psychotherapy or if their psychological impairment (BSI-18 GSI score) was below 4. The sample size at three-week follow-up is displayed at the bottom.

spanned three weeks for all groups with one session per week. In FTF-CBT, sessions lasted 1.5 hours, while I-CBT had a flexible time frame to work on the PMR during the week. Overall, the intervention lasted 3 to 5 weeks for FTF-CBT and 3 to 8 weeks for I-CBT. The WLC received the intervention after all assessments were completed, either as FTF- or I-CBT.

Sample

139 students applied for the intervention that was advertised through social media and leaflets at the university (Figure 2). Exclusion criteria were:

1. Current suicidal or psychotic ideation ($n=0$).
2. Additional psychotherapy during the time of participation ($n=11$).
3. Lack of psychopathological distress ($n=15$; operationalized as a sum value [GSI] of the symptom questionnaire BSI-18 [31] below 4 as cut-off criterion corresponding to the mean of a non-clinical sample).

After exclusions, 19 of 113 remaining participants dropped out during the study. The final sample consisted of 94 students (Male: 24; Female: 70) with a mean age of $M=25.12$ ($SD=4.92$). Subjects did not receive any compensation for participation.

Intervention

The intervention was conducted either as FTF-CBT in an individual setting or as I-CBT via the platform Minddistrict. For I-CBT, participants received tutorial as well as additional information regarding the online counseling process. To ensure participants' agreement, information sheets and consent forms were given at the beginning of the first session. Worksheets and procedures were translated from the workshop material [32]. The PMR activates resilient emotions, thoughts, metaphors, images and behaviors in four steps during the three sessions [19,32]:

1. Search resilience and talents

Experiences of strengths, talents and positive emotions are activated (session 1).

2. Construct PMR

In the context of a selected area of resilience, resilient behaviors are delineated. Typical resilience strategies are identified (e.g. social support, creativity, flexibility, physical activity, optimism, spiritual activities) and summarized in the PMR on the level of behavior, automatic thoughts, attitudes and metaphors/ images. As homework, the individual is asked to validate the strategies in everyday life and look for supplementary strategies (session 1).

3. Apply to problem area

In the next step, the PMR is revised based on everyday experiences. Subsequently, problem areas are identified. PMR strategies are analyzed whether they might be useful or how they can be adapted for the problem area. Behavioral experiments concerning the feasibility of the resilience strategies are developed and implemented as homework (session 2).

4. Generalization and transfer

In a final step, the behavioral experiments are reviewed. The use of resilience strategies is reinforced and further experiments are developed. Moreover, other strategies from the PMR are reviewed and the transfer to other difficult situations is encouraged (session 3).

For I-CBT, participants worked regularly on 3 modules analogous to the FTF sessions described above. Information was adapted for the internet and worksheets were transformed into interactive forms. Similar to FTF, homework was encouraged and evaluated and students exchanged information with counselors via secure text messaging within the platform. Counselors gave feedback, provided guidance or suggestions, and contacted the participants at least after completion of a module.

Measures

BSI-18 (pre, post, follow-up): The Brief Symptom Inventory-18 [31,33,34] is a short form of the BSI [35]. By selecting the most sensitive and valid items from each subscale of the BSI, it measures psychopathology (somatization, depression, and anxiety). By summing up all items the General Symptom Index (GSI) is constructed (Cronbach's α between 0.85 and 0.89 in this study).

BDI-II (pre, post, follow-up): The Beck Depression Inventory II is a 21-item, self-report questionnaire to measure symptoms of depression with a sum score (Cronbach's α between 0.87 and 0.90 in this study) [36,37].

SIAS (pre, post, follow-up): The Social Interaction Anxiety Scale is a self-report questionnaire measuring social anxiety [38,39]. It consists of 20 items that are summed up (Cronbach's α between 0.90 and 0.91 in this study).

RS-11 (pre, post, follow-up): The resilience scale-11 consists of 11 items that assess psychological resilience as a trait [40]. A total score is calculated by summarizing all items (Cronbach's α in this study between 0.81 and 0.86).

MLDL-C (follow-up): The Munich Quality of Life Dimension List-Change Scale asks participants to directly estimate changes in quality of life compared to before the intervention [41]. It comprises 19 items that are assigned to the subscales "physical condition", "psyche", "social life", "everyday life" as well as a total score (Cronbach's α in this study between 0.75 and 0.90). It is assessed at follow-up only.

WAI-SR (session 1, 2 and 3): The Working Alliance Inventory-Short Revised [42,43] is a shortened and validated self-report questionnaire based on the Working Alliance Inventory [44]. The inventory was adapted to the I-CBT setting and assessed after each session. The 12 items were averaged for a total score representing the overall quality of the alliance (Cronbach's α in this study between 0.91 and 0.94).

Data analysis

The data analysis was conducted via SPSS 23. To assure randomization and analyze pre-treatment differences, a multivariate analysis of variance (MANOVA) with group (FTF-, I-CBT and WLC) as fixed factor and pre-treatment scores and age as dependent variables as well as a Chi-Square Test for sex were calculated. Intervention effects were analyzed with repeated-measures analyses of variance (rANOVAs) with time (pre, post and follow-up) as within-subject factor, group as between-subject factor and questionnaire scores as dependent variables. The Greenhouse-Geisser adjustment was used to correct for violations of sphericity. Post-hoc rANOVAs were used to compare two subgroups and were reported with Benjamini-Hochberg correction to avoid alpha-inflation. Interaction effects were transformed from partial eta-squared (η_p^2) to Cohen's d . For MLDL-C, assessed at follow-up, a MANOVA with group (FTF-, I-CBT and WLC) as fixed factor was calculated, between-group effect sizes were transformed from η_p^2

| Variables | I-CBT n=27 | | FTF-CBT n=31 | | WLC n=36 | | Group × time interaction all groups | Group × time interaction I-CBT vs. WLC | Group × time interaction I-CBT vs. WLC | Group × time interaction FTF-CBT vs. WLC |
|-------------------------------------|------------|-------|--------------|-------|----------|-------|--|--|--|--|
| | M | SD | M | SD | M | SD | | | | |
| Psychopathology (BSI-18 GSI) | | | | | | | | | | |
| Pre | 12.63 | 7.91 | 14.77 | 10.8 | 12.28 | 7.52 | F (3.64,165.53) ^a =0.63 | F (1.77,99.10) ^a =0.28 | F (2,122)=0.43 | F (1.75,113.42) ^a =1.15 |
| Post | 8.48 | 7.13 | 9.61 | 8.95 | 9.56 | 6.24 | $\eta^2_p=0.01, d=0.24$ | $\eta^2_p=0.01, d=0.14$ | $\eta^2_p=0.01, d=0.17$ | $\eta^2_p=0.02, d=0.27$ |
| Follow-up | 8.48 | 9.72 | 9.16 | 8.71 | 8.56 | 6.69 | -- | -- | -- | -- |
| d pre-follow-up | 0.47 | -- | 0.64 | -- | 0.42 | -- | -- | -- | -- | -- |
| Depression (BDI-II) | | | | | | | | | | |
| Pre | 11.15 | 7.39 | 15.26 | 8.91 | 11.72 | 7.46 | F(3.31,150.54) ^a =3.84** | F(1.66,93.16) ^a =3.43* | F(1.71,104.11) ^a =1.92 | F(1.57,102.33) ^a =6.11**b |
| Post | 7.00 | 6.35 | 9.42 | 7.60 | 10.08 | 5.68 | $\eta^2_p=0.08, d=0.58$ | $\eta^2_p=0.06, d=0.50$ | $\eta^2_p=0.03, d=0.36$ | $\eta^2_p=0.09, d=0.62$ |
| Follow-up | 7.07 | 7.94 | 7.23 | 7.72 | 7.75 | 5.71 | -- | -- | -- | -- |
| d pre-follow-up | 0.51 | -- | 1.00 | -- | 0.49 | -- | -- | -- | -- | -- |
| Social anxiety (SIAS) | | | | | | | | | | |
| Pre | 21.52 | 13.15 | 20.90 | 15.10 | 20.53 | 11.30 | F (3.74,170.29) ^a =1.07 | F (2,112)=1.13 | F(1.77,107.84) ^a =1.56 | F (2,130)=0.52 |
| Post | 17.26 | 11.30 | 19.23 | 14.34 | 19.22 | 11.06 | $\eta^2_p=0.02, d=0.31$ | $\eta^2_p=0.02, d=0.28$ | $\eta^2_p=0.03, d=0.32$ | $\eta^2_p=0.01, d=0.18$ |
| Follow-up | 17.30 | 12.38 | 17.45 | 14.87 | 18.67 | 9.75 | -- | -- | -- | -- |
| d pre-follow-up | 0.32 | -- | 0.26 | -- | 0.14 | -- | -- | -- | -- | -- |
| Resilience (RS-11) | | | | | | | | | | |
| Pre | 58.04 | 7.36 | 54.45 | 10.80 | 58.08 | 10.36 | F (3.64,165.56) ^a =2.75* | F(1.79,100.16) ^a =1.57 | F(1.77,107.76) ^a =1.32 | F (2,130)=5.52**b |
| Post | 60.63 | 7.36 | 59.39 | 9.45 | 57.33 | 10.91 | $\eta^2_p=0.06, d=0.49$ | $\eta^2_p=0.03, d=0.34$ | $\eta^2_p=0.02, d=0.29$ | $\eta^2_p=0.08, d=0.58$ |
| Follow-up | 59.19 | 9.53 | 59.61 | 8.73 | 58.06 | 11.29 | -- | -- | -- | -- |
| d pre-follow-up | 0.12 | -- | 0.53 | -- | 0.00 | -- | -- | -- | -- | -- |
| d_M | 0.36 | -- | 0.61 | -- | 0.26 | -- | 0.41 | 0.32 | 0.29 | 0.41 |

Notes: [†] $p \leq 0.10$ * $p \leq 0.05$ ** $p \leq 0.01$
^a Greenhouse-Geisser-corrected
^b significant post-hoc difference after Benjamini-Hochberg correction.

Table 1: Psychopathology, depression, social anxiety and resilience before the intervention (pre) after the intervention (post) and after three weeks of self-practicing (follow-up); mean scores and standard deviation for internet-based CBT (I-CBT), face-to-face CBT (FTF-CBT) and wait-list control (WLC); group × time interaction effects of repeated measure ANOVAs and effect sizes (η^2_p and Cohen's d); post-hoc group × time interactions between groups with effect sizes (η^2_p and Cohen's d).

to Cohen's *d*, and post-hoc tests with Sidak adjustment were performed. Working alliance group differences were evaluated by rANOVA with session (1, 2 and 3) as within-subject factor, group as between-subject factor and WAI-SR total score as dependent variable. All within-group effect sizes for pre to follow-up changes were computed as Cohen's *d* [45].

Results

Before intervention, groups did not differ in age ($F [2,91]=19.83, p=0.45$), psychopathology ($F [2,91]=0.74, p=0.48$), depression ($F [2,91]=2.39, p=0.10$), social anxiety ($F [2,91]=0.04, p=0.96$), resilience ($F [2,91]=1.42, p=0.25$) or sex ($\chi^2 [2,N=94]=4.93, p=0.09$). There was a significant difference in the number of dropouts between groups ($\chi^2 [2,N=113]=9.28, p<0.05$): Most participants dropped out in I-CBT (31%), followed by FTF-CBT (14%) and WLC (5%). In post-hoc tests further comparisons did not reach significance anymore after alpha adjustment.

From pre to follow-up, for psychopathology (BSI-18), social anxiety (SIAS), depression (BDI-II) and resilience (RS-11) time effects were found (BSI-18: $F [1.82,165.53]=23.63, p<0.001$; BDI-II: $F [1.65,150.54]=44.16, p<0.001$; SIAS: $F [1.87,170.29]=11.13, p<0.001$; RS-11: $F [1.82,165.56]=4.40, p<0.05$). While there were no significant group differences for any dimension, rANCOVAs showed significant group × time interaction effects for depression (BDI-II) and resilience (RS-11; Table 1). Post-hoc rANOVAs comparing two groups demonstrated that interaction effects in depression and resilience were

due to the significant group × time interaction between FTF-CBT and WLC on both dimensions even after alpha adjustment: Compared to WLC, FTF-CBT improved more concerning depression and resilience (Table 1). The group × time interaction between FTF-CBT and I-CBT in depression did not withstand alpha adjustment. Regarding effect sizes, FTF-CBT profited most from the intervention with an average pre to follow-up effect size of $d=0.61$. I-CBT had an average effect of $d=0.36$, whereas WLC also profited from waiting with an average effect of $d=0.26$.

Change in quality of life ratings at follow-up showed significant group differences and trends (Table 2): While WLC participants estimated the mean change in quality of life with $M=5.06$, I-CBT gained $M=5.47$ and FTF-CBT $M=5.70$ on average. Since the middle of the scale (4.5) indicated no change, the lowest profit for WLC and the highest for FTF-CBT were assumed. The higher change rating in intervention groups was due to the MLDL-C subscales “physis” and “psyche” showing significant group effects. The subscales “social life” and “everyday life” do not indicate any difference between the groups. Between-group effect sizes demonstrated most profit for FTF-CBT vs. WLC ($d=0.46$), followed by I-CBT vs. WLC ($d=0.32$). There was also marginally more quality of life for FTF-CBT compared to I-CBT ($d=0.16$).

Concerning the therapeutic alliance, the rANOVA showed a significant group difference between FTF-CBT and I-CBT with better alliance ratings for FTF-CBT (Table 3). At the same time, there was

| Variables | I-CBT n=27 | | FTF-CBT n=31 | | WLC n=36 | | Group Effect | d FTF-CBT vs. I-CBT | d I-CBT vs. WLC | d FTF-CBT vs. WLC |
|----------------------|-------------------|------|-------------------|------|---------------------|------|---|---------------------|-----------------|-------------------|
| | M | SD | M | SD | M | SD | | | | |
| Mean quality of life | 5.47 | 1.25 | 5.70 | 1.34 | 5.06 | 0.83 | $F(2,91)=2.67^T$ $\eta^2_p=0.06, d=0.48$ | 0.18 | 0.39 | 0.56 |
| Physis | 5.27 | 1.28 | 5.69 ^a | 1.39 | 4.87 ^a | 1.33 | $F(2,91)=3.18^*$ $\eta^2_p=0.07, d=0.53$ | 0.31 | 0.31 | 0.58 |
| Psyche | 5.81 ^b | 1.49 | 5.81 ^c | 1.69 | 4.94 ^{b,c} | 1.46 | $F(2,91)=3.47^*$ $\eta^2_p=0.07, d=0.55$ | 0.00 | 0.57 | 0.54 |
| Social life | 5.47 | 1.46 | 5.67 | 1.72 | 5.16 | 1.22 | $F(2,91)=1.05$ $\eta^2_p=0.02, d=0.31$ | 0.13 | 0.23 | 0.34 |
| Everyday life | 5.38 | 1.57 | 5.65 | 1.53 | 5.26 | 1.19 | $F(2,91)=0.62$ $\eta^2_p=0.01, d=0.24$ | 0.17 | 0.09 | 0.29 |
| d_M | -- | -- | -- | -- | -- | -- | 0.42 | 0.16 | 0.32 | 0.46 |

Notes: ^T $p \leq 0.10$ * $p \leq 0.05$
^a significant post-hoc difference, $p < .05$, Sidak-corrected
^{b,c} post-hoc trend, $p < .10$, Sidak-corrected

Table 2: Quality of life at follow-up (MLDL-C); mean scores and standard deviations for internet-based CBT (I-CBT), face-to-face CBT (FTF-CBT) and wait-list control (WLC); between-group effect of MANOVA and between-group effect sizes (η^2_p and Cohen's d); effect sizes between groups (Cohen's d).

| Variables | I-CBT n=27 | | FTF-CBT n=31 | | Time effect | Group effect | Group × time interaction |
|-------------------------|------------|------|--------------|------|-------------------------|-------------------------|--------------------------|
| | M | SD | M | SD | | | |
| Total mean score | | | | | | | |
| Session 1 | 3.10 | 0.86 | 4.08 | 0.63 | $F(2,100)=26.17^{***}$ | $F(1,50)=26.38^{***}$ | $F(2,100)=1.83$ |
| Session 2 | 3.44 | 0.61 | 4.25 | 0.58 | $\eta^2_p=0.34, d=1.37$ | $\eta^2_p=0.35, d=1.38$ | $\eta^2_p=0.04, d=0.36$ |
| Session 3 | 3.77 | 0.70 | 4.47 | 0.48 | -- | -- | -- |
| d session 1-session 3 | 0.75 | -- | 0.44 | -- | -- | -- | -- |

Notes: ^T $p \leq 0.10$ * $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 3: Therapeutic alliance (WAI-SR); mean scores and standard deviations for internet-based CBT (I-CBT) and face-to-face CBT (FTF-CBT); within-group (time), between-group, and interaction effect (group × time) of rANOVA and effect sizes (η^2_p and Cohen's d).

a significant time effect, demonstrating that alliance scores improved from session 1 to session 3. Regarding effect sizes from session 1 to 3, I-CBT profited slightly more over time with an effect size of $d=0.75$ compared to $d=0.44$ for FTF-CBT.

Discussion

The aim of the present study was to examine whether a strengths-based therapeutic approach – the Personal Model of Resilience (PMR) – works as an internet-based intervention as well as a face-to-face intervention compared to a wait-list control group for students experiencing psychosocial stress. In a successfully randomized trial, there were significant group × time interaction effects in depression and resilience with more profit for the intervention groups, especially for FTF-CBT in comparison to WLC. No differential effects for general psychopathology and social anxiety were found. While FTF-CBT indicated up to large effect sizes, I-CBT profited less with up to medium effect sizes. Surprisingly, WLC group also improved with up to small effect sizes. Post-hoc analyses demonstrated that significant interactions in depression and resilience were due to differences between FTF-CBT and WLC. Moreover, intervention group clients directly rated their change in quality of life as significantly higher than WLC indicating a positive, strengthening effect of the intervention. While results support research on positive interventions' efficacy, effect sizes in this study were even larger than in other positive interventions in current meta-analyses [20,46].

In contrast to meta-analyses stating that computerized CBT is equally beneficial as face-to-face CBT [10], the current study found further tendencies that the same strengths-based intervention is not as well-accepted and beneficial in an internet-based setting compared to the classical face-to-face setting. First, there were descriptive differences between the interventions in pre to follow-up effect sizes with more profit for FTF-CBT (for example resilience: I-CBT $d=0.12$;

FTF-CBT $d=0.53$). Second, dropout rates significantly differed between groups with most dropouts in I-CBT. It can only be speculated why the internet setting did not fare as well as in other studies. A possible reason might be the asynchronous mode of communication [47]. While immediate feedback about coping strategies was given in FTF-CBT, the delay in online feedback may have affected participants' benefit [48]. Moreover, counselors reported that some of the I-CBT participants asked for FTF-CBT after randomization and seemed to be disappointed with motivational problems. Also, the longer time span participants in I-CBT took – possibly associated with less coherence of the intervention – may have impacted results: Duration of the intervention was between 3 to 8 weeks in I-CBT, while FTF-CBT only took 3 to 5 weeks. As research on internet-based interventions mainly focuses on intense online therapy and not on short interventions [49] like in this study, it is possible that longer and more intensive collaboration is required [50].

Additionally, the therapeutic alliance may be a process indicator for differential setting effects: Although the alliance improved significantly over time in both intervention groups, there was still a significant group difference. The therapeutic alliance in FTF-CBT was very good from the beginning and still improved over time while in I-CBT no such strong relationship was built within 3 sessions. Overall, the alliance results are in contrast to current research stating equal therapeutic alliances in face-to-face and electronic treatments [51-54].

Surprisingly, WLC had a substantial decrease in psychopathology and depression from pre to follow-up as well. On the one hand, the effect could be explained by a spontaneous remission of symptoms as reported by meta-analyses for tinnitus and major depressive symptoms [55,56].

On the other hand, retest effects that had been reported for the SCL-90 – the precursor of the BSI-18 [57] – might be an explanation.

In the same manner, Sharpe and Gilbert [58] found testing effects for the BDI after repeated administration. Participants were hypothesized to have reacted to negative mood scales by presenting themselves in a more socially desirable way at the next measurement, habituated or reacted to the negative mood scales by activating coping strategies. The authors therefore propose multiple baseline measures besides untreated control groups. Moreover, Young [59] found reliable effects of waiting for a wide range of psychological domains in anxiety and depressive disorders exceeding a retest-effect.

The results of this study are consistent with previous findings on the PMR: As an option to bridge the waiting time for therapy, the PMR has been shown to be useful as a three-session group intervention [22]. In a study with distressed students in need for counseling, the PMR in a face-to-face setting was superior to a matched control group [23]. In a third study comparing the PMR to a three-session cognitive ABC intervention sensu Ellis [60], the PMR was at least equally effective, and at the same time superior to an untreated control group [61].

As the PMR has now been evaluated in different settings, the next step would be the examination of the incremental value of PMR as an enriching module in a CBT treatment whose methods and results can be reactivated repeatedly in the course of therapy [18].

Conclusion

In summary, it can be stated that the resilience-oriented PMR worked slightly better for stressed-out students in a face-to-face setting than internet-based. The potential of an I-CBT approach for the PMR has to be explored further, particularly in clinical contexts. Compared to a waiting condition, the effects are to some extent significantly superior. The therapeutic relationship has been rated better in FTF-CBT than in I-CBT. As a therapy module, the PMR is an interesting supplement of problem-oriented approaches either in an internet-based setting or face-to-face. At the same time, it can stand alone as a positive approach to deal with problems using already existing strengths. Researchers and clinicians are strongly encouraged to integrate strength-based approaches into CBT.

Declaration of Conflicting Interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

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