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Integrating yoga with psychological group-treatment for mixed depression and anxiety in primary healthcare: An explorative pilot study

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ABSTRACT

Background and purpose: Yoga has shown promise as a treatment for depression and anxiety. The present pilot study investigated the feasibility of an eight-week grouptreatment integrating emotion-focused psychoeducation, compassion-focused therapy, and Virya yoga for depression and anxiety in primary healthcare.
Materials and methods: Patients seeking treatment for depression and anxiety in a primary healthcare centre completed either an integrative group-treatment (N = 14) or treatment as usual (TAU, N = 17). Outcome measures were analysed pre- and posttreatment. Correlations in the intervention group were investigated between treatment outcomes and amount of yoga practice between sessions.
Results: Large within-group effect sizes on all outcome measures were found at posttreatment. Symptom reduction did not differ between groups ($p = 0.155$). Improvement in alexithymia correlated significantly ($p < 0.05$) with amount of yoga practice between sessions.
Conclusion: Integrating yoga with a psychological group-treatment is a somewhat feasible approach to treatment for depression and anxiety in primary healthcare.

1. Introduction

Contemporary research indicates that interventions centred upon the practice of yoga can offer an alternative form of treatment for depression [1,2] and anxiety [3,4]. In the exploration of psychological treatment models for depression and anxiety, therapies targeting individuals' emotions and emotion regulation have resulted in promising outcomes [5–7]. In particular, an increasing body of research highlights that restricted emotional processing, associated with alexithymia, is an underlying factor in depression and anxiety disorders [8,9]. However, limited research has explored the use of yoga as a method for targeting individuals' emotional processing in relation to anxiety and depression. The aim of the present study was to examine the utility of a guided yoga practice focusing upon individuals' processing of emotions (i.e., reducing levels of alexithymia) in the treatment of anxiety and depression within a primary healthcare setting.

Alexithymia is characterized by difficulties in identifying and describing emotions, differentiating between affective states, discriminating feelings and body sensations of emotional arousal, as well as an external cognitive style [10]. Although an increased awareness of psychophysiological sensations may reduce levels of alexithymia, no studies to date have examined the possible effects of yoga on alexithymia. A few studies have highlighted that treatments focusing on features of alexithymia tend to decrease depressive symptoms [11], however limited research has examined changes in alexithymia as an outcome measure [12].

In light of the associations observed between restricted emotional processing and mental health [4,7,9], educating patients about the role of emotions as well as emotion regulation strategies is a theoretically reasonable approach to treatment. Affect school (AS) is an educational psychotherapy aiming to enhance participants' ability to identify, differentiate, and verbally express emotions [12]; it is based on Tomkins' Affect Theory [13,14] and Nathanson's basic definitions: affect, feeling, emotion, and script [15]. Previous research of AS has indicated improvements in symptoms of depression and anxiety [16], and alexithymia [12]. In addition to working with identifying, differentiating, regulating, and expressing emotions, the necessity of self-compassion has been emphasized in order to endure painful emotional experiences triggered during exposure to previously avoided emotions [17,18].

Self-compassion consists of three main components: 1) mindfulness,

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2) common humanity, and 3) self-kindness [18]. Several studies have found self-compassion to be negatively correlated with symptoms of depression [19] and anxiety [20,21], as well as being positively correlated with measures of quality of life [22]. Compassion-focused therapy (CFT) has been developed as a structured form of psychotherapy dealing with shame and self-criticism [17] and has shown promising results as a treatment for mood disorders [23]. Treatment models with a similar approach to psychopathology as CFT include yoga practice to enhance awareness of emotional and physical experiences (e.g. Mindfulness-Based Cognitive Therapy for depression [24]). Additionally, there is emerging evidence for the positive impact of yoga practice on self-compassion [25,26].

Meta-analyses investigating the efficacy of yoga as a treatment for anxiety and depression have reported promising treatment effects [1,3,4]. Numerous forms of yoga practice exist and have been used in mental health treatments (e.g., Hatha yoga) [4]. Hatha yoga has been considered a health-related physical activity, because it includes poses improving muscular strength and endurance, flexibility, and balance [27]. In particular, the present study examined Virya yoga, a dynamic form of Hatha yoga [28], which focuses upon physical exercise in the form of yoga asana while incorporating meditative techniques aiming to direct awareness towards an individual's inner experience and breathing. Virya yoga can be classified as a low-intensity physical activity in accordance with the definition proposed by Caspersen et al. [29] and is well suited for use with individuals possessing a wide range of levels of physical fitness.

Recent studies have found the intensity of the physical activity to be a less influential factor in reducing symptoms of depression and anxiety [30,31]. Moreover, Helgadóttir and colleagues [32] note low-intensity exercise to be a particularly effective treatment alternative for reducing depression severity. In addition to the reduction of symptoms of depression and anxiety, previous studies have indicated that yoga tends to improve quality of life [33], and as a form of physical activity it has the potential to promote various other physical health benefits (e.g., reduced risk of diabetes, coronary heart disease, cancer [34]).

In consideration of the psychophysiological impact of depression and anxiety [35], it appears warranted that interventions apply multidimensional forms of treatment that can collectively address the multiple aspects of the conditions that influence individuals' physical and mental health. There is, today, a large number of studies that highlight the role of emotion regulation in the development of psychopathology associated with a variety of syndromes [35,36]. It has been argued that emotion regulation could be a central *trans*-diagnostic construct, creating a core fundamental dimension shared across a variety of disorders (e.g., depression and anxiety [37]). There is also a growing consensus for the assumption that *trans*-diagnostic treatments, focusing on emotion regulation, have the potential to address comorbid disorders simultaneously and hence improve efficiency of the treatment [38].

The present study combined different psychological approaches of emotion processing and regulation with yoga, in order to address the need for a treatment approach that targets both psychological and physiological aspects of depression and anxiety. That said, limited research has examined the intervention strategy of integrating multiple therapeutic components into a single approach to treatment. Moreover, previous studies have predominantly explored the efficacy of treatment interventions that are not situated in 'real world' healthcare settings [39]. The primary aim of the present pilot study was to examine the feasibility of an eight-week psycho-educative group treatment, consisting of AS, CFT, and Virya yoga, as well as the feasibility of teaching yoga as a physical activity intervention to individuals diagnosed with mild to moderate mixed depression and anxiety in a primary healthcare centre. A secondary aim was to examine potential relationships between alexithymia and self-compassion with treatment outcomes for the patients undertaking the group treatment.

2. Materials and methods

2.1. Participants

Patients attending a primary healthcare centre in northern Sweden, seeking treatment for anxiety and depression, were approached for recruitment to the study. The inclusion criteria for the study required patients to be $\geq$ 18 years of age, and possess a diagnosis of mild to moderate mixed depression and anxiety (i.e., either a specific diagnosis of depression or anxiety, or a combination of both) as assessed by a member of staff at the primary healthcare centre (i.e., a psychiatric nurse, a counsellor, and/or psychologist). Patients were diagnosed through the use of the standard semi-structured assessment interview undertaken face to face at the primary healthcare centre, in combination with measures of depression and anxiety symptoms (see Measures section of the present study for additional details). The exclusion criteria were reports of suicidal ideation, and previous experience of cognitive behavioural treatment for depression and anxiety at a primary healthcare centre. At the time of intake assessment, patients' depression and anxiety, general health, perceived stress, and insomnia were measured by a member of staff at the primary healthcare centre. To maintain ecological validity, patients who were on medications for anxiety or depression were not excluded from the present study. If the patient met the criteria for inclusion (and not the exclusion criteria), and expressed interest in participating in the study, they were provided additional information sheets outlining the nature of the treatment and the study protocol. Prior to commencing the study, following the intake assessment interview, all participants provided written informed consent.

Estimation of the required sample size for the intervention group was done in consultation with the clinicians at the primary healthcare centre; the sample size sought to both provide the opportunity to pilot the integrative group treatment and reflect the real-world healthcare setting. Therefore, the average group size (10–12 patients/group) and standard treatment drop-out rates (approximately 50% from recruitment to completion) informed the sample size of the present pilot study in order to explore the feasibility and effects of the intervention.

All patients received a phone call a week prior to the start of treatment and were asked if they remained interested in participating; if not, they were replaced with a patient that also went through the same recruitment process. Participants in the intervention group (n = 24) were then allocated into one of two groups. Allocation into one of the two groups was determined by patients' availability to consistently attend one of the two weekdays during which the treatment was offered; patients were provided the opportunity to select one of the two days for treatment. Each group was comprised of 12 patients to facilitate manageable group-sizes for treatment; both groups underwent the same treatment protocol during the same time period.

The same assessment and recruitment procedure applied to all patients seeking treatment for anxiety and depression at the primary healthcare centre. The collection of outcome data from patients participating in psychological group-treatment at the primary healthcare centre is standard procedure. Control group data were extracted from patients who participated in the most recent previous psychological group-treatment (n = 17). The data were extracted from two groups of participants that followed the same group allocation procedure of the intervention group (i.e., based on patients' availability relating to two weekday options), in order to compare the effects of the intervention in the present study with patients receiving treatment as usual (TAU).

The study's protocol was reviewed by the institution's internal review process and the primary health care centre provided their approval for the study to be undertaken with patients attending their premises.

2.2. Intervention

The treatment consisted of an eight-week psycho-educative group treatment, comprised of weekly 2-h sessions. The treatment was based

on AS, CFT, and a Virya yoga practice. For the first 60–75 min, patients received psychoeducation, experiential practices, and exposure assignments to better understand and regulate emotions. The final 45–60 min of each session were spent engaging in instructor-led Virya yoga, with a theme relating to the session content of that week, and self-compassion exercises from CFT [17] and mindful compassion practices [40]. The Virya yoga practice was performed in two phases. The first three sessions were performed using a slower physical programme where the patients could use a chair for support, while the last five sessions were performed using a more physically demanding and active programme, without the use of a chair for support. The self-compassion exercises were practiced before the end of each yoga session, with gradually increasing duration and difficulty throughout the treatment period. Generally, affects were discussed in the context of culture and evolution, with a focus on their adaptive and maladaptive expressions with a basis in Tomkins' Affect theory [13,14] and modern research on emotion [7]. Participants were also given instructions for analysing and dealing with problematic situations from a CFT perspective, as well as cognitive and behavioural techniques to deal with rumination and repetitive thinking. The treatment was delivered by the same two psychologists in the research team for both treatment groups, using the same treatment manual, one of the psychologists being a certified yoga teacher. See Fig. 1 for an outline of the treatment protocol.

Participants were instructed to bring a USB memory stick to the first session of treatment; on the memory stick they were provided two video-recorded yoga classes to be accessed in completion of weekly assignments to practice the yoga at home between sessions. See Table 1 for an outline of the content of the Virya yoga classes.

A clinical psychologist contacted patients if they were absent from two consecutive sessions or scored considerably lower on weekly measures, to investigate if they still wished to participate in the group treatment or if they required additional treatment.

2.2.1. *Treatment as usual*

Treatment as usual (TAU) consisted of an eight-week transdiagnostic cognitive-behavioural treatment including behavioural activation,

Treatment procedure	Session content
Week 1	Rationale for treatment, introduction to affects, emotions, mindfulness and home assignments of yoga practice. Practice brief attention-focused mindfulness meditation.
Week 2	Psychoeducation and discussion about interest, surprise, and an introduction to self-compassion. Practice self-compassion break and attention-focused mindfulness meditation.
Week 3	Psychoeducation, discussion and exposure to fear, psychoeducation about fear-associated negative automatic thoughts, impulses/behaviour, and physiological reactions. Strategies to deal with fear and imagery exposure exercises. Introduction to acceptance. Practice self-compassion break.
Week 4	Psychoeducation, discussion and exposure to anger. Introduction to self-compassion in daily life. Practice creating an inner safe space.
Week 5	Psychoeducation, discussion and exposure to disgust and dissmell. Imagery exposure exercises. Malan's triangles. Practice creating an inner safe space.
Week 6	Psychoeducation, discussion and exposure to shame, pride and guilt. Practice self-compassion in relation to shame. Imagery exposure exercises of shame. Practice self-compassion meditation.
Week 7	Psychoeducation, discussion and exposure to distress, anguish, worry and anxiety. Imagery exposure exercises and cognitive and behavioral strategies to deal with rumination, worry and anxiety. Practice creating a compassionate self.
Week 8	Psychoeducation, discussion and exposure to enjoyment and strategies for maintenance of treatment gains. Practice self-compassion meditation.

Fig. 1. Outline of the treatment protocol for the intervention group.

Table 1
Content outline of Virya yoga classes.

Module	Still	Active
1. Warm-up	Seated on chair. Spine-rolls, backbend and spine-rotation.	Tadasana. Dynamic backbending to curving thoracic spine, to dynamic rotations in Utkatasana.
2. Sun-salutations	Tadasana. Spine-rolls to backbend, to side-bend in Utthita Anjaneyasana.	Tadasana. Utkatasana to Utthita Anjaneyasana, to Utkatasana, to Uttanasana.
3. Standing positions	Support from chair. Utthita Anjaneyasana with rotation, modified Uttanasana.	Dynamic Utkata Konasana with side-bend to Virabhadrasana II.
4. Balance	Vrksasana.	Dynamic Utkata Konasana to balance on one leg.
5. Arm-balance and core	Seated on chair. Dynamic Navasana.	Dynamic one-legged balance to Utkata Konasana, to plank position.
6. Hip-openers	Seated on chair. Modified Urdhva mukha sukhasana.	Face-down on the floor. Stretch of Quadriceps.
7. Backbends	Seated backbend with or without support from chair.	Dynamic Bhujangasana and modified Shalabasana.
8. Forward-folds	Support from chair. Modified Prasarita padottanasana.	Supine on the floor. Supta padangusthasana to modified Supta konasana.
9. Finishing postures	Short seated mindfulness-meditation.	Thread-the-needle.
10. Savasana	Savasana.	Savasana.

Note: Each class within the treatment was taught with the method of Virya yoga described by Selander [28]. Each Virya yoga class is divided into ten modules of asana, as well as a short meditation before commencement of the physical practice. The first, called the "Still" program, was delivered with a focus on mindfully controlling movements and breathing with the possibility of support from using a chair. The second, called the "Active" program, was delivered with a focus on increasing heartrate with simple but physically demanding movements. Both programs included controlled breathing, mindful awareness of thoughts, emotions, and physical sensations. Instructions were given for achieving postural balance, while mindfully loading muscles and joints.

cognitive restructuring, mindfulness exercises, and graded exposure. Treatment as usual was delivered with weekly 2-h sessions throughout the eight-week treatment period, with homework assignments between each session. This model for TAU was the first line of treatment for patients seeking treatment for mild-to-moderate anxiety and depression at the primary healthcare centre.

2.3. Treatment outcomes

A blinded outcome assessment procedure was applied; pre- and post-measures were administered, collected, and coded by assistants at the primary healthcare centre. Measures of self-compassion, alexithymia, and positive and negative affect were only included and analysed for the intervention group.

2.3.1. Measures

Self-Compassion Scale (*SCS;* [41]) measures six factors of self-compassion in a 26-item self-report questionnaire. The six factors are: self-kindness, self-judgement, common humanity, isolation, mindfulness, and over-identification. Items are rated on a Likert scale from 1 (*almost never*) to 5 (*almost always*). The SCS has demonstrated good psychometric properties in both clinical and non-clinical groups [42]. The internal consistency of the SCS in the present study was good ($\alpha = 0.82$).

Toronto Alexithymia Scale (*TAS-20;* [43]) measures three factors of alexithymia in a 20-item self-report questionnaire. The 3 factors are: difficulty identifying feelings (DIF), difficulty describing feelings (DDF), and externally oriented thinking (EOT). The items are rated on a Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). All items are summed and the overall score ranges from 20 to 100, where $\geq$60 indicates alexithymia and $\leq$51 no alexithymia [43]. The TAS-20 has demonstrated good psychometric properties [43], with similar findings found in a Swedish sample [44]. The internal consistency of the TAS-20 in the present study was adequate ($\alpha = 0.72$).

The Positive and Negative Affect Schedule Short-Form (*PANAS-SF;* [45]) is designed to measure positive (5 item) and negative (5 item) affect in a 10 item self-report questionnaire. Responders rate to what extent they have experienced each item's particular affective state the past week, using a Likert scale from 1 (*very slightly or not at all*) to 5 (*very much*). The positive and negative items are then summed separately to create one positive affect (PA) score and one negative affect (NA) score. The PANAS-SF is comparable to the original PANAS, both regarding temporal stability, convergent and criterion-related validity [45]. The internal consistency of the PANAS-SF was found to be adequate for the NA scale ($\alpha = 0.66$) and good for the PA scale ($\alpha = 0.90$) in the present study.

Brunnsviken Brief Quality of Life (BBQ; [46]*)* is a 12-item self-report questionnaire designed to measure quality of life. The questionnaire relates to six different aspects of life: leisure, view on life, creativity, learning, friends and friendship, and view on self. The items are rated on a Likert scale from 0 (*Strongly disagree*) to 4 (*Strongly agree*). All items are added together and the overall BBQ score ranges from 0 to 96. The BBQ has excellent test-retest reliability, as well as concurrent and convergent validity [46]. The internal consistency of the BBQ in the present study was excellent ($\alpha = 0.91$).

Group Session Rating Scale (*GSRS;* [47]) is a self-report questionnaire measuring group therapy alliance using 4-items to assess the following aspects: relationship, goals and topics, approach or method, and overall. The response options are on an analogue scale; participants are required to bisect a 10 cm line, with low estimates to the left and high estimates to the right. The GSRS has demonstrated adequate psychometric properties [47], the internal consistency of the GSRS in the present study was excellent ($\alpha = 0.96$).

Generalized Anxiety Disorder 7-item scale (*GAD-7;* [48]) is a self-report questionnaire with 7 items, designed to identify cases of generalized anxiety disorder and the symptoms' severity over the last two weeks. The response options are on a Likert rating scale from 0 (*not at all*) to 3 (*nearly everyday*) and scores on the items are summed for an overall GAD-7 score ranging from 0 to 21; levels of anxiety are classified as: $\geq$5 mild, $\geq$10 moderate and, $\geq$15 severe [48]. The GAD-7 has demonstrated good psychometric properties [48]. The internal consistency of the GAD-7 in the present study was excellent ($\alpha = 0.91$).

Patient Health Questionnaire-9 (*PHQ-9;* [49]) is a 9-item self-report questionnaire designed to identify cases of depression and the symptoms' severity over the last two weeks. Items are rated on a Likert scale from 0 (*not at all*) to 3 (*almost everyday*). All items are added together and the overall PHQ-9 score ranges from 0 to 27; levels of depression are classified as: $\geq$5 mild, $\geq$10 moderate, $\geq$15 moderately severe, and $\geq$20 severe [49]. The PHQ-9 demonstrates good psychometric properties [49]. Similar findings were found in a Swedish sample [50] and the internal consistency of the PHQ-9 in the present study was adequate ($\alpha = 0.76$).

Outcome Rating Scale (*ORS;* [51]) is a self-report questionnaire designed to briefly measure treatment outcome using 4-items using visual analogue scales assessing the following aspects: individually, interpersonally, socially, and overall. Participants bisect each of the 10 cm lines, with low estimates to the left and high estimates to the right. The ORS has adequate concurrent and construct validity [51], the internal consistency of the ORS in the present study was excellent ($\alpha = 0.96$).

A Weekly Report of Yoga Practice was also administered to assess the amount of yoga practice per week. The report consists of two subscales: number of yoga sessions, and total time reported in minutes. Patients were instructed to record each yoga session completed as well as the amount of time spent in each session. The amount of yoga sessions completed were added together, as well as the total time spent practicing yoga at home throughout the treatment to create two different subscale scores.

2.4. Data analysis

An independent samples *t*-test was carried out to investigate if attrition could be explained by differences at pre-measures in the intervention group. Pre- and post-measures were analysed from both the intervention group and the control group. An independent samples *t*-test was carried out to determine if the groups differed significantly at pre-measures. Due to the observed differences, a multivariate analysis of covariance (MANCOVA) was carried out to examine differences between the intervention group and the control group on the outcome measures pre- and post-treatment in both groups. Paired samples t-tests were used to examine the mean difference from pre-to post-measures. Cohen's d was used to calculate within-group effect sizes [52]. Correlations between difference scores from pre-to post-measures and the total score of the weekly reports of yoga practice were examined using Pearson's r [52] in the intervention group.

3. Results

3.1. Participant flow

From recruitment to pre-measures, six participants declined participation. From pre-measures to post-measures, ten patients dropped out of treatment. See Fig. 2 for reported reasons for choosing to withdraw from the study.

3.2. Baseline data

Clinical characteristics and baseline data were collected at pre-measures (see Table 2). Clinical characteristics are presented for the main outcome measures in both groups. For the intervention group, the secondary measures included are also presented. Attrition data and baseline demographic information was not available for patients completing TAU, as these were not recorded in the data register of the primary healthcare centre. In the intervention group (N = 14), four participants were male (28.6%) and 10 were female (71.4%), the mean age was 34, with a range from 19 to 67.

Table 2
Baseline data and clinical characteristics (mean scores on measures at pre-treatment) including standard deviations (SD).

Scale	Intervention (SD)	TAU (SD)
PHQ-9	10.43** (4.11)	15.59** (3.71)
GAD-7	7.86** (3.44)	13.82** (3.05)
ORS	19.57* (5.38)	15.07* (4.29)
BBQ	45.14 (23.13)	34.65 (10.51)
PA	12.07 (3.15)	
NA	14.36 (3.86)	
TAS-20	53.21 (8.28)	
SCS	2.34 (0.75)	

*p < 0.05, **p < 0.01. PHQ-9 = Patient Health Questionnaire-9; GAD-7 = Generalized Anxiety Disorder 7-item Scale; ORS= Outcome Rating Scale; BBQ= Brunnsviken Brief Quality of Life; PA= Positive Affect; NA= Negative Affect; TAS-20 = Toronto Alexithymia Scale; SCS= Self-Compassion Scale. Results with significant differences from independent samples *t*-test are marked with an asterisk.

3.3. Outcomes and estimation

Due to the pre-measures being significantly different between groups, a MANCOVA was performed to analyse the efficacy of the treatments. The MANCOVA, (F (4, 22) = 1.85, p = 0.155; Wilks' Lambda = 0.748; partial $\eta^2 = 0.252$) showed no differences in treatment outcomes for the ORS, GAD-7, PHQ-9, and BBQ between groups. Paired-samples t-tests were performed to examine the effectiveness of the treatment condition on the outcome measures separately.

Paired samples t-tests showed that patients in the intervention group

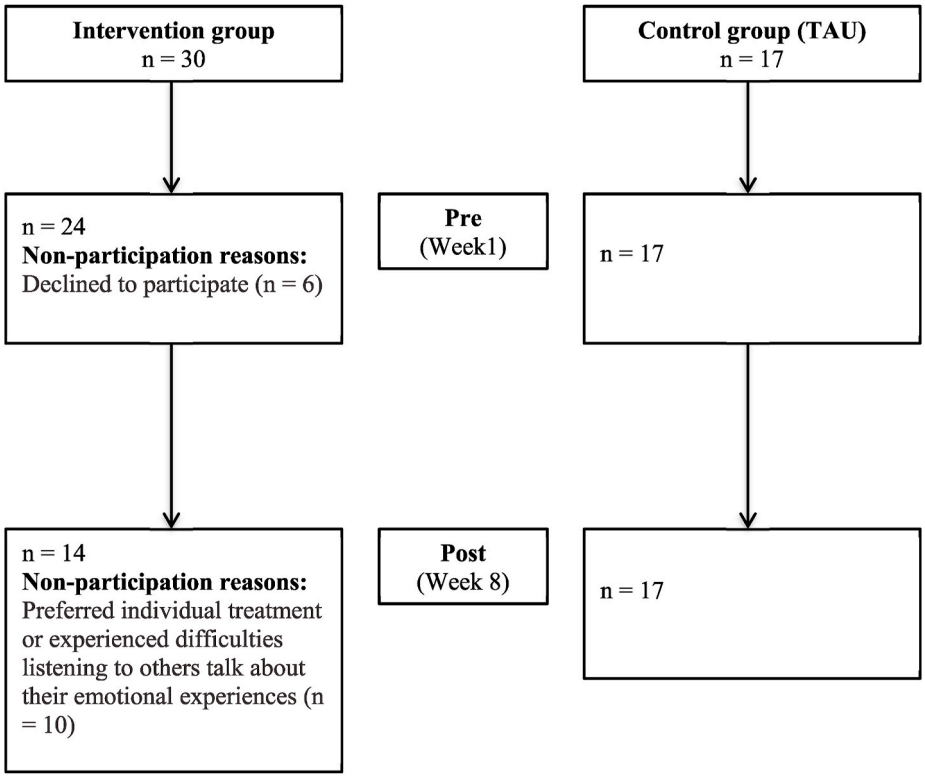

Fig. 2. Participant flow.
Note: Since data was extracted only for patients who completed TAU and participated in pre- and post-measures, data on attrition and reasons for not participating in the control group is not available.

improved on the GAD-7 (t (13) = 2.76, p = 0.016, d = 1.53); the PHQ-9, (t (13) = 3.83, p = 0.002, d = 2.47), and the ORS, (t (13) = −4.58, p = 0.001, d = −2.54). Patients in the intervention group reported more PA (t (13) = −2.51, p = 0.026, d = −1.39), and less NA (t (13) = 5.45, p < 0.001, d = 3.02) at the end of treatment. They also reported improvements on the GSRS (t (13) = −5.87, p < 0.001, d = −3.25), as well as improvements in the SCS (t (13) = −3.09, p = 0.009, d = −1.72), and TAS-20 (t (13) = 3.49, p = 0.004, d = 1.93) at the end of treatment. Patients who received TAU also improved on the GAD-7 (t (16) = 3.16, p = 0.006, d = 3.41), the PHQ-9, (t (16) = 2.73, p = 0.015, d = 2.12), and the ORS (t (16) = −3.87, p = 0.001, d = −1.94). Patients who received TAU reported improvements on the BBQ (t (16) = −4.49, p < 0.001, d = −2.25), while patients in the intervention group did not (t (13) = −1.78, p = 0.099, d = −0.98). To summarize, patients in both groups improved with large within-group effect sizes on symptoms of depression, anxiety, and overall functioning. Patients who received TAU improved on reports of quality of life. Patients in the intervention group also improved with large within-group effect sizes on reports of positive affect, group therapy alliance, self-compassion, and alexithymia. See Table 3 for mean differences.

3.4. Yoga practice between sessions

Throughout the eight weeks of treatment in the intervention group, participants practiced on average 6.7 sessions of yoga between group treatment sessions, with a range from 1 to 15 sessions. They practiced on average 192 min of yoga between group treatment sessions, with a range from 20 to 511 min.

3.5. Correlations between measures in the intervention group

There were moderate correlations between the change in TAS-20 scores and amount of yoga sessions (r = −0.642, p = 0.013), the total amount of time spent practicing yoga at home (r = −0.561, p = 0.037), and the change in PA (r = −0.537, p = 0.048). Therefore, greater amounts of time spent practicing yoga were associated with an increase in positive affect and a reduction in alexithymia. See Table 4 for correlations.

There were moderate correlations between the change in the SCS and the change in the GAD-7 (r = −0.536, p = 0.048). Therefore, the increase in self-compassion was associated with the reduction in anxiety symptoms.

Table 3
Results from paired samples t-test of mean differences from pre-to post-measures including standard deviations (SD) and means at post-treatment.

Scale	Intervention (SD)	Means post (SD)	TAU (SD)	Means post (SD)
BBQ	−7.71 (16.24)	52.86 (25.27)	−9.53** (8.73)	44.18 (24–70)
GAD-7	3.43* (4.65)	4.43 (3.92)	3.41** (4.46)	10.41 (3–16)
PHQ-9	4.79** (4.68)	5.64 (4.34)	2.47* (3.73)	13.12 (7–22)
ORS	−9.51** (7.77)	29.08 (8.92)	−6.75** (7.18)	21.82 (5.1–36.5)
GSRS	−6.13** (3.91)	36.39 (3.39)		
PA	−2.86* (4.26)	14.93 (5.20)		
NA	4.79** (3.29)	9.57 (2.65)		
TAS-20	7.43** (7.97)	45.79 (6.65)		
SCS	−0.51** (0.62)	2.85 (0.47)		

*p < 0.05, **p < 0.01. BBQ= Brunnsviken Brief Quality of Life; GAD-7 = Generalized Anxiety Disorder 7-item Scale; PHQ-9 = Patient Health Questionnaire-9; ORS= Outcome Rating Scale; GSRS = Group Session Rating Scale; PA= Positive Affect; NA= Negative Affect; TAS-20 = Toronto Alexithymia Scale; SCS= Self-Compassion Scale.

Table 4
Results from Pearson's correlations between the difference scores of the TAS-20 and other measures.

Scale	1.	2.	3.	4.	5.
1. TAS-20	–	0.826**	−0.642*	−0.561*	−0.537*
2. DIF		–	−0.729**	−0.680**	−0.440
3. Yoga sessions			–	0.955**	0.224
4. Yoga minutes				–	0.265
5. PA					–

*p < 0.05, **p < 0.01. TAS-20 = Toronto Alexithymia Scale; DIF = Difficulty Identifying Feelings; PA= Positive Affect.

4. Discussion

The present pilot study investigated the effects of an eight-week psychological group treatment programme integrating aspects of affect school (AS), compassion-focused therapy (CFT), and Virya yoga practice with patients seeking healthcare for mild to moderate mixed depression and anxiety disorders in a primary healthcare centre. The effects of the intervention on symptoms of depression, anxiety, and overall functioning were comparable to TAU (i.e., consisting of an eight-week cognitive-behavioural group-treatment). The overall findings highlight the potential and promising treatment effects of practicing Virya yoga integrated with psychological emotion regulation strategies when targeting depression and anxiety. In particular, patients in the intervention group improved significantly on measures of self-compassion and alexithymia; additionally, improvements in anxiety symptoms were associated with increases in self-compassion. Further, improvement in alexithymia was associated with the amount of yoga practiced between sessions (both duration and frequency), and with increased reports of positive affect.

The observed effects of the integration of the three treatment components in the present study were somewhat expected as each component has demonstrated positive results when implemented separately [1,3,12,23]. However, improvements in alexithymia highlighted in the present study were realised with the use of a shorter intervention in comparison with studies implementing longer and more costly treatment protocols. For example, Bressi and colleagues [53] reported similar improvements on measures of alexithymia in patients undertaking a 40-session psychodynamic psychotherapy intervention delivered individually.

In exploring a less costly group-based treatment, patients in the present study reported similar improvements in self-compassion as noted in studies of mindfulness-based stress reduction [54]. Further, associations between improved self-compassion and anxiety symptoms were in line with previous research [21,22]. Although yoga has been incorporated into mindfulness-based interventions with the proposal that yoga is a means of increasing awareness of emotional and physical experiences [24], previous research has not linked the use of yoga to the potential reduction of alexithymia. However, further research is required to investigate the underlying mechanisms of Virya yoga in the targeting of alexithymia, anxiety, and depression to enhance the efficacy of treatment and optimise conditions for participants to maintain a consistent yoga practice.

The mental health benefits associated with engaging in physical activity [30–32] and Hatha yoga [1,3,4] support the integration of Virya yoga with psychological treatments in addition to the well-established physical benefits of regular yoga practice [27]. Additionally, considering the mean amount of yoga practice performed between treatment sessions observed in the present study, providing patients with instructional videos and/or ending each treatment session with a physical yoga practice could be a means to incorporate Virya yoga as a component of psychological treatment.

In consideration that patients who completed yoga practice at home more frequently, and for longer duration, reported greater improvements in alexithymia it may be beneficial to invest in efforts aiming to

increase compliance with homework assignments of practicing yoga. Perhaps an increase in treatment sessions could also improve outcomes, as well as increase the opportunities for incorporating a regular yoga practice outside of treatment sessions for patients. That said, delivering yoga sessions as an integrated part of psychological group-treatment requires access to facilities large enough to accommodate the movement required. Taking this into consideration, providing somewhat smaller treatment groups could reduce the requirement of seeking large (and potentially costly) facilities.

Decreasing the group-size could also be a possible means to improve the high drop-out rates observed in the present study; in particular, the reported reasons for drop-out were associated with the group-format (preferring individual treatment to group-treatment and experiencing difficulties listening to others talk about their emotional experiences). This is in line with previous studies suggesting that clinician contact is an important factor to enhance adherence [55]. As such, by reducing the group-sizes the individual participants' clinician contact could increase, which in turn could help to reduce the risk of dropout. In addition, previous research has reported differences in adherence between efficacy and effectiveness studies [55]. This could perhaps, in part, be attributed to how participants are recruited. In efficacy studies, the participants sign up for a specific form of treatment (a form of treatment that they may have previous experience or expectations); in effectiveness studies, participants get assigned to a certain treatment, which could affect motivation to continue treatment. In order to further reduce incidence of drop-out that occurs both before and after the first treatment session, increased screening procedures could be undertaken to ensure that group-treatment is appropriate for participating patients. Indeed, previous research has found that certain characteristics, such as symptom severity and favoured emotion-regulation strategies, affects patients' inclinations toward group-treatment [56]. However, consultative/treatment sessions are increasingly being delivered remotely via online interactions [57], and the present intervention programme could be well suited for development as an internet-based treatment.

A strength of the present study is the increased ecological validity gained by undertaking research within a standard community-based health centre. However, it must be acknowledged that patients' involvement with additional treatments (e.g. medication) were not monitored during the study. Further, participants' previous experience of yoga or psychological treatments for anxiety and depression, as well as current levels of physical activity were not recorded. In light of the proposed benefits of physical activity interventions for mental health, continued research in 'real world' healthcare settings are essential in determining the effectiveness of multimodal treatments within specific contexts [58].

The research design used in the present study relied primarily upon self-report measures, and follow-up post-treatment measures (e.g., 6 months) were absent. The use of diagnostic interviews and clinical assessments as a complement to self-reports would offer greater reliability in data collection. Further, in the absence of follow-up measures, there is no evidence of the lasting effectiveness of the treatment or patients' continuation of yoga practices. In further consideration of research design, the integrated AS, CFT, and Virya yoga aspects of the treatment prevent the opportunity to differentiate the effectiveness of the individual components of the treatment. More refined statistical analyses could offer greater insight into how the different components of the intervention protocol related to outcome measures; however, this was not possible due to the small sample size and associated power of the analyses. Moreover, considering the present study is a pilot study with a small sample size, generalizability of these findings is limited; multi-site replication with a randomized-controlled trial design is warranted to provide greater insight into the effectiveness and efficacy of the treatment with more heterogeneous populations.

5. Conclusion

The present study provides preliminary support for the potential of integrating AS, CFT, and Virya yoga, in the treatment of mild-to-moderate mixed depression and anxiety disorders in a group-based psychological treatment setting. Moreover, it provides additional support for the importance of promoting self-compassion to reduce anxiety symptoms and alexithymia. Several improvements should be considered to further improve feasibility, especially in terms of drop-out reduction and homework compliance. Taken collectively, the findings in the present study highlight the potential benefits of integrating yoga as an adjunct to psychological treatments. Further research is warranted to understand the efficacy of the underlying mechanisms in treatment effects and optimise the conditions for the integration and maintenance of regular yoga practice in treating depression and anxiety disorders.

Author statement

Gustav Jonsson: Conceptualization, Data Curation, Formal analysis, Investigation, Writing – Original Draft, Writing – Review & Editing, Visualization. **Lisa Franzén:** Conceptualization, Data Curation, Formal analysis, Investigation, Writing – Original Draft, Writing – Review & Editing, Visualization. **Markus Nyström:** Resources, Validation, Methodology, Writing – Review & Editing**. Paul Davis:** Supervision, Validation, Project administration, Methodology, Writing – Review & Editing

Declaration of competing interest

The corresponding author teaches at the Nordic Yoga Institute, an institute educating yoga teachers in the Virya yoga method. Otherwise, the authors of the research team have no competing interests to declare.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ctcp.2020.101250.

References

[1] H. Cramer, D. Anheyer, R. Lauche, G. Dobos, A systematic review of yoga for major depressive disorder, J. Affect. Disord. 213 (2017) 70–77.
[2] S. Prathikanti, R. Rivera, A. Cochran, J.-G. Tungol, N. Fayazmanesh, E. Weinmann, Treating major depression with yoga: a prospective, randomized, controlled pilot trial, PloS One 12 (3) (2017), e0173869.
[3] H. Cramer, R. Lauche, D. Anheyer, K. Pilkington, M. Manincor, G. Dobos, et al., Yoga for anxiety: a systematic review and meta-analysis of randomized controlled trials, Depress. Anxiety 35 (9) (2018) 830–843.
[4] S. Hofmann, G. Andreoli, J. Carpenter, J. Curtiss, Effect of Hatha yoga on anxiety: a meta-analysis, J. Evid. Base Med. 9 (3) (2016) 116–124.
[5] M. Berking, D. Ebert, P. Cuijpers, S. Hofmann, Emotion regulation skills training enhances the efficacy of inpatient cognitive behavioral therapy for major depressive disorder: a randomized controlled trial, Psychother. Psychosom. 82 (4) (2013) 234–245.
[6] M. Berking, P. Wupperman, A. Reichardt, T. Pejic, A. Dippel, H. Znoj, Emotion-regulation skills as a treatment target in psychotherapy, Behav. Res. Ther. 46 (11) (2008) 1230–1237.
[7] K.L. Gratz, N.H. Weiss, M.T. Tull, Examining emotion regulation as an outcome, mechanism, or target of psychological treatments, Current opinion in psychology 3 (2015) 85–90.
[8] S. Hofmann, A. Sawyer, A. Fang, A. Asnaani, Emotion dysregulation model of mood and anxiety disorders, Depress. Anxiety 29 (5) (2012) 409–416.

[9] S. Li, B. Zhang, Y. Guo, J. Zhang, The association between alexithymia as assessed by the 20-item Toronto Alexithymia Scale and depression: a meta-analysis, Psychiatr. Res. 227 (1) (2015) 1–9.
[10] G. Taylor, M. Bagby, J. Parker, What's in the name 'alexithymia'? A commentary on "Affective agnosia: expansion of the alexithymia construct and a new opportunity to integrate and extend Freud's legacy, Neurosci. Biobehav. Rev. 68 (2016) 1006–1020.
[11] V. Günther, M. Rufer, A. Kersting, T. Suslow, Predicting symptoms in major depression after inpatient treatment: the role of alexithymia, Nord. J. Psychiatr. 70 (5) (2016) 392–398.
[12] E. Melin, H. Thulesius, B. Persson, Affect School for chronic benign pain patients showed improved alexithymia assessments with TAS-20, Biopsychosoc. Med. 4 (2010) 5.
[13] S. Tomkins, Affect Imagery Consciousness Volume I: the Positive Affects, Springer Publishing Company, New York, 1962.
[14] S. Tomkins, Affect Imagery Consciousness Volume II: the Negative Affects, Springer Publishing Company, New York, 1963.
[15] D.L. Nathanson, Shame and Pride, Affect, Sex, and the Birth of the Self, Norton, London, 1992.
[16] J. Bergdahl, A. Larsson, L. Nilsson, K. Åhlström, L. Nyberg, Treatment of chronic stress in employees: subjective, cognitive and neural correlates, Scand. J. Psychol. 46 (5) (2005) 395–402.
[17] P. Gilbert, The origins and nature of compassion focused therapy, Br. J. Clin. Psychol. 53 (1) (2014) 6–41.
[18] K. Neff, Self-compassion: an alternative conceptualization of a healthy attitude toward oneself, Self Ident. 2 (2) (2003) 85–101.
[19] T. Krieger, D. Altenstein, I. Baettig, N. Doerig, M. Holtforth, Self-compassion in depression: associations with depressive symptoms, rumination, and avoidance in depressed outpatients, Behav. Ther. 44 (3) (2013) 501–513.
[20] A. Macbeth, A. Gumley, Exploring compassion: a meta-analysis of the association between self-compassion and psychopathology, Clin. Psychol. Rev. 32 (6) (2012) 545–552.
[21] F. Raes, Rumination and worry as mediators of the relationship between self-compassion and depression and anxiety, Pers. Indiv. Differ. 48 (6) (2010) 757–761.
[22] N.-T. Van Dam, S.-C. Sheppard, J.-P. Forsyth, M. Earleywine, Self-compassion is a better predictor than mindfulness of symptom severity and quality of life in mixed anxiety and depression, J. Anxiety Disord. 25 (1) (2011) 123–130.
[23] J. Leaviss, L. Uttley, Psychotherapeutic benefits of compassion-focused therapy: an early systematic review, Psychol. Med. 45 (5) (2015) 927–945.
[24] J. Teasdale, J. Williams, Z. Segal, The Mindful Way Workbook: an 8-week Program to Free Yourself from Depression and Emotional Distress, Guilford Publications, New York, 2014.
[25] T. Gard, N. Brach, B. Hölzel, J. Noggle, L. Conboy, S. Lazar, Effects of a yoga-based intervention for young adults on quality of life and perceived stress: the potential mediating roles of mindfulness and self-compassion, J. Posit. Psychol. 7 (3) (2012) 165–175.
[26] N. Snaith, T. Schultz, M. Proeve, P. Rasmussen, Mindfulness, self-compassion, anxiety and depression measures in South Australian yoga participants: implications for designing a yoga intervention, Compl. Ther. Clin. Pract. 32 (2018) 92–99.
[27] M. Grabara, Could hatha yoga be a health-related physical activity? Biomed. Hum. Kinet. 8 (1) (2016) 10–16.
[28] J. Selander, Våga Yoga: Yogafilosofi I Vardagen Och Viryayoga Från Grunden (1. Uppl, Miro, Stockholm, 2008.
[29] C. Caspersen, K. Powell, G. Christenson, Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research, Publ. Health Rep. 100 (2) (1985) 126–131, 1974-.
[30] M.B. Nyström, G. Neely, P. Hassmén, P. Carlbring, Treating major depression with physical activity: a systematic overview with recommendations, Cognit. Behav. Ther. 44 (4) (2015) 341–352.
[31] G. Stonerock, L. Hoffman, B. Smith, M. Blumenthal, Exercise as treatment for anxiety: systematic review and analysis, Ann. Behav. Med. 49 (4) (2015) 542–556.
[32] B. Helgadóttir, M. Hallgren, Ekblom, Y. Forsell, Training fast or slow? Exercise for depression: a randomized controlled trial, Prev. Med. 91 (2016) 123–131.
[33] D. Sivaramakrishnan, C. Fitzsimons, P. Kelly, K. Ludwig, N. Mutrie, D.H. Saunders, et al., The effects of yoga compared to active and inactive controls on physical function and health related quality of life in older adults- systematic review and meta-analysis of randomised controlled trials, Int. J. Behav. Nutr. Phys. Activ. 16 (1) (2019) 1–22.
[34] D. Warburton, S. Charlesworth, A. Ivey, L. Nettlefold, S. Bredin, A systematic review of the evidence for Canada's Physical Activity Guidelines for Adults, Int. J. Behav. Nutr. Phys. Activ. 7 (1) (2010) 39.
[35] P.J. Lang, L.M. McTeague, M.M. Bradley, The psychophysiology of anxiety and mood disorders: the RDoC challenge, Z. für Psychol. 225 (3) (2017) 175–188.
[36] J.M. Lavender, S.A. Wonderlich, S.G. Engel, K.H. Gordon, W.H. Kaye, J.E. Mitchell, Dimensions of emotion dysregulation in anorexia nervosa and bulimia nervosa: a conceptual review of the empirical literature, Clin. Psychol. Rev. 40 (2015) 111–122.
[37] E. Sloan, K. Hall, R. Moulding, S. Bryce, H. Mildred, P.K. Staiger, Emotion regulation as a transdiagnostic treatment construct across anxiety, depression, substance, eating and borderline personality disorders: a systematic review, Clin. Psychol. Rev. 57 (2017) 141–163.
[38] D.H. Barlow, T.J. Farchione, J.R. Bullis, M.W. Gallagher, H. Murray-Latin, S. Sauer-Zavala, et al., The unified protocol for transdiagnostic treatment of emotional disorders compared with diagnosis-specific protocols for anxiety disorders: a randomized clinical trial, JAMA psychiatry 74 (9) (2017) 875–884.
[39] P. Cuijpers, Four decades of outcome research on psychotherapies for adult depression: an overview of a series of meta-analyses, Canadian Psychology/ Psychologie canadienne 58 (1) (2017) 7.
[40] P. Gilbert, P. Choden, Mindful Compassion: How the Science of Compassion Can Help You Understand Your Emotions, Live in the Present and Connect Deeply with Others, New Harbinger Publications, Inc, Oakland, 2014.
[41] K. Neff, The development and validation of a scale to measure self-compassion, Self *Ident.* 2 (3) (2003) 223–250.
[42] P. Castilho, J. Pinto-Gouveia, J. Duarte, Evaluating the multifactor structure of the long and short versions of the self-compassion scale in a clinical sample, J. Clin. Psychol. 71 (9) (2015) 856–870.
[43] R.M. Bagby, J.D.A. Parker, G.J. Taylor, The twenty-item Toronto Alexithymia scale-I. Item selection and cross-validation of the factor structure, J. Psychosom. Res. 38 (1) (1994) 23–32.
[44] M. Simonsson-Sarnecki, L. Lundh, B. Törestad, R. Bagby, G. Taylor, J. Parker, A Swedish translation of the 20-item Toronto alexithymia scale: cross-validation of the factor structure, Scand. J. Psychol. 41 (1) (2000) 25–30.
[45] E.R. Thompson, Development and validation of an internationally reliable short-form of the positive and negative affect Schedule (PANAS), J. Cross Cult. Psychol. 38 (2) (2007) 227–242.
[46] P. Lindner, O. Frykheden, D. Forsström, E. Andersson, B. Ljótsson, E. Hedman, et al., The brunnsviken Brief quality of life scale (BBQ): development and psychometric evaluation, Cognit. Behav. Ther. (2016) 1–14.
[47] K. Quirk, S. Miller, B. Duncan, J. Owen, Group Session Rating Scale: preliminary psychometrics in substance abuse group interventions, Counsell. Psychother. Res. J. 13 (3) (2013) 194–200.
[48] R. Spitzer, K. Kroenke, J. Williams, B. Löwe, A Brief measure for assessing generalized anxiety disorder: the GAD-7, Arch. Intern. Med. 166 (10) (2006) 1092–1097.
[49] K. Kroenke, R. Spitzer, J. Williams, The PHQ-9, J. Gen. Intern. Med. 16 (9) (2001) 606–613.
[50] M. Hansson, J. Chotai, A. Nordström, O. Bodlund, Comparison of two self-rating scales to detect depression: HADS and PHQ-9, Br. J. Gen. Pract. 59 (566) (2009) E283–E288.
[51] S.D. Miller, B.L. Duncan, J. Brown, J.A. Sparks, A.A. Claud, The outcome rating scale: a preliminary study of the reliability, validity, and feasibility of a Brief visual analog measure, J. Brief Ther. 2 (2) (2003) 91–100.
[52] N. Brace, R. Kemp, R. Snelgar, SPSS for Psychologists, third ed., Palgrave Macmillan, New York, 2006.
[53] C. Bressi, S. Fronza, E. Minacapelli, E. Nocito, E. Dipasquale, L. Magri, et al., Short-term psychodynamic psychotherapy with mentalization-based techniques in major depressive disorder patients: relationship among alexithymia, reflective functioning, and outcome variables - a pilot study, Psychol. Psychother. Theor. Res. Pract. 1 (November) (2016) 1–15.
[54] K. Birnie, M. Speca, L. Carlson, Exploring self-compassion and empathy in the context of mindfulness-based stress reduction (MBSR), Stress Health 26 (5) (2010) 359–371.
[55] Z. Hilvert-Bruce, P.J. Rossouw, N. Wong, M. Sunderland, G. Andrews, Adherence as a determinant of effectiveness of internet cognitive behavioural therapy for anxiety and depressive disorders, Behav. Res. Ther. 50 (7–8) (2012) 463–468.
[56] B. Strauss, L. Spangenberg, E. Brahler, B. Bormann, B. Braehler, Attitudes towards (psychotherapy) groups: results of a survey in a representative sample, Int. J. Group Psychother. 65 (3) (2015) 411–430.
[57] M.B. Nyström, A. Stenling, E. Sjöström, G. Neely, P. Lindner, P. Hassmén, et al., Behavioral activation versus physical activity via the internet: a randomized controlled trial, J. Affect. Disord. 215 (2017) 85–93.
[58] B. Flay, A. Biglan, R. Boruch, F. González Castro, D. Gottfredson, Kellam, et al., Standards of evidence: criteria for efficacy, effectiveness and dissemination, Prev. Sci. 6 (3) (2005).