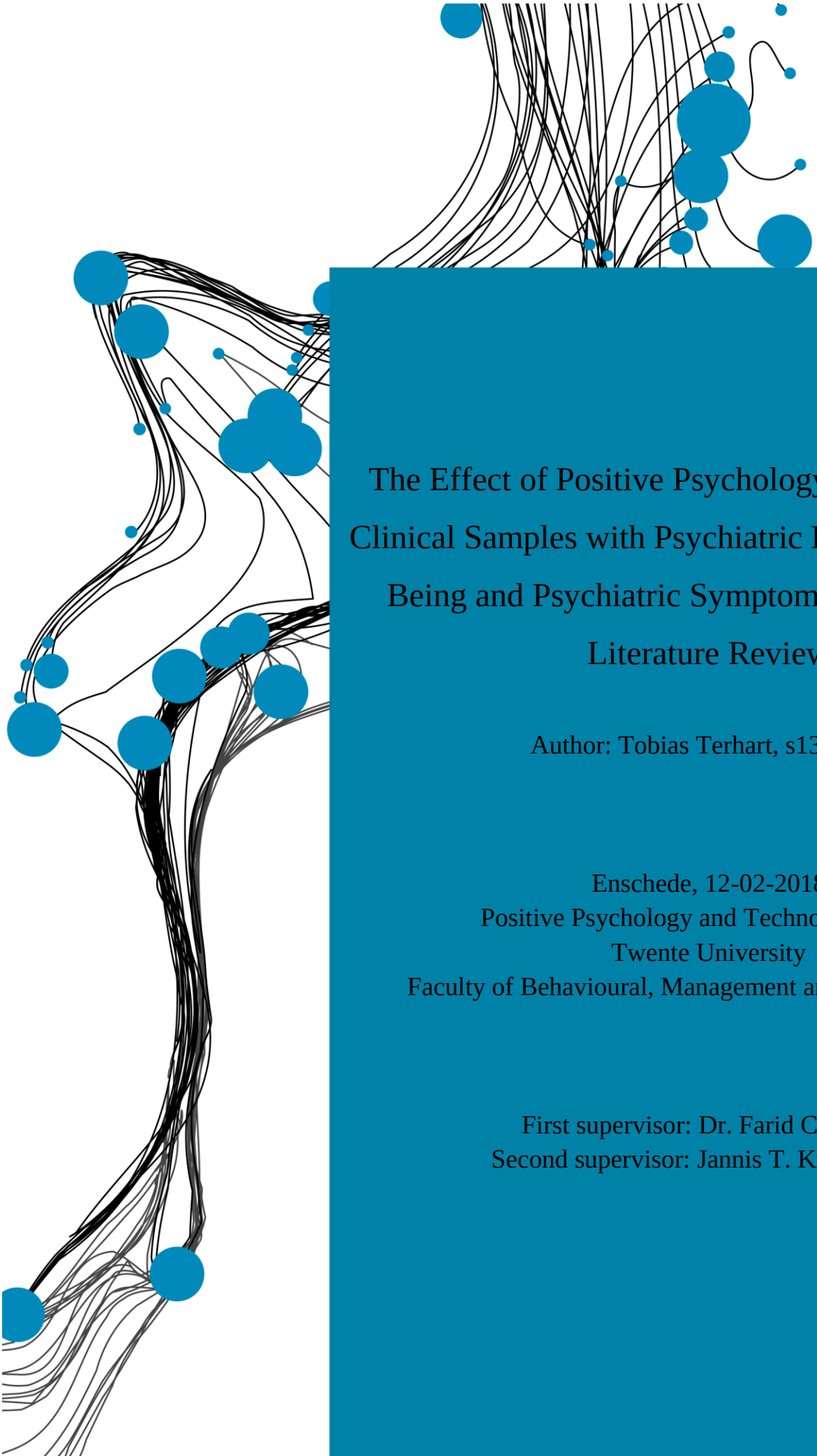

# The Effect of Positive Psychology Interventions in Clinical Samples with Psychiatric Disorders on Well-Being and Psychiatric Symptoms: A Systematic Literature Review

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## Declarations


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**Abstract**

*Background:* Research on positive psychological interventions [PPIs] suggests significant but small to medium effects on mental health in non-clinical samples, yet data is inconclusive whether PPIs are beneficial for clinical samples. The aim of this systematic literature review is to describe the effects of PPIs in clinical samples with psychiatric disorders on well-being and psychiatric symptoms (depression, anxiety, stress).

*Methods:* A systematic literature review was performed following PRISMA guidelines. The study quality was assessed using the Jadad scale and the Cochrane Collaboration's tool for assessing risk of bias. The PPIs were recoded into the five elements from Seligman's well-being theory (PERMA). Lastly, Pearson's bivariate correlation coefficients were calculated and tested for statistical significance between the sum of the PERMA elements and the effect sizes.

*Results:* The included 15 studies (N = 950) displayed different psychiatric disorders (depression being most frequent), sample groups (489 in PPIs, 461 in control), ages (M = 40.29, range = [18; 68]) and PPI components. For increasing well-being 14 of the 15 studies reported small to large effect sizes (range = [0.15; 1.81]), 13 of the 15 for reducing symptoms of depression (range = [0.12; 2.13]), 8 out of 8 for anxiety (range = [0.30; 2.53]) and 4 out of 5 for stress (range = [0.38; 1.40]). The sum of the PERMA elements was not associated with the effect size of any outcome measure (well-being, depression, anxiety, stress). All used studies were of low or medium quality.

*Conclusion:* PPIs seem to be innovative and for many patients with psychiatric disorders effective. The patients benefit in increased well-being and reduced pathological symptoms. Further, the applicability of the PERMA model appears to be a fitting paradigm to describe well-being but is not a necessity for the function of PPIs in clinical samples. It may be time to explore the applicability of PPIs as complementary programs to psychotherapy by practitioners to garner more practical insights and further the scientific efforts.

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# Introduction

## Positive Psychological Interventions within Clinical samples

Positive Psychological Interventions [PPIs] aim to enhance positive feelings, behaviors and cognitions of the individual as well as the community (Seligman, Steen, Park & Peterson, 2005). PPIs are used for building strengths (Sin & Lyubomirsky, 2009), strengthening positive emotions and raising awareness of these positive emotions (Seligman et al., 2005) and focus on enabling conditions of life (Seligman, 2010). Interventions or treatments aiming to fix, remedy or heal something which is pathological or deficient cannot be seen as PPIs (Sin & Lyubomirsky, 2009).

Pioneers in the development and application of PPIs were Seligman and colleagues in 2005. The PPIs were named 1) gratitude visit, 2) three good things in life, 3) you at your best, 4) using signature strengths in a new way, 5) identifying signature strengths (Seligman et al., 2005). Regarding the effectiveness of these interventions, the PPIs identifying signature strength and three good things, increased well-being and decreased depressive symptoms both immediate and for six months after the intervention in nonclinical samples (Seligman, et al., 2005). These PPIs inspired a throng of different positive approaches such as: savoring, gratitude letters, practicing optimistic thinking, replaying positive experiences, kindness, promoting positive relationships, and pursuing hope and meaning, for both nonclinical samples and clinical samples (Chakhssi, Kraiss, Sommer-Spijkerman & Bohlmeijer, 2017; Schueller & Parks, 2014; Sin & Lyubomirsky, 2009).

PPIs are seen to have the potential to enhance the treatments of psychiatric disorders such as depression, anxiety or stress not only by reducing negative symptoms but by primarily building positive emotions, behaviors and feelings. Especially people diagnosed with psychiatric disorders that seem to have negative attitudes seem to benefit from PPIs (Asgharipoor, Asgharnejad, Arshadi, & Sahebi, 2012). Their level of life-satisfaction and well-being seems to be lower while being compared to healthy people (Asgharipoor et al., 2012). The absence of well-being might create specific conditions of vulnerability and is a potential risk factor for psychiatric diseases (Keyes, 2007; Westerhof & Keys, 2010; Wood & Joseph, 2010). Therefore, it seems important to enhance well-being in patients with psychiatric disorders.

## Well-Being and Psychiatric Symptoms

One model that has been specifically developed to improve well-being in individuals is the PERMA model (Seligman, 2011). The PERMA model outlines well-being in terms of five measurable domains: positive emotions (P), engagement (E), relationships (R), meaning (M), and accomplishments (A). Positive emotions are related to specific feelings of a person's happiness. Psychological connection to activities or organizations refers to engagement. The domain of positive relationships is both related to the feeling of being socially integrated, cared for and supported by others and of being satisfied with one's social connections. Meaning is related to the belief that one's life is valuable and the feeling of being connected to something greater than oneself. The term accomplishments refers to the feeling of being capable to fulfill daily activities, making progress towards goals and having a sense of achievement (Seligman, 2011).

The concept of human well-being is measurable via the PERMA model (Seligman, 2010). As well-being is a construct of five elements, no element alone defines well-being, but the fulfillment of each element contributes to higher well-being (cf. Seligman, 2011). Huppert and So (2009) used criteria of the European Social Survey [ESS], that were similar to the PERMA elements to combine subjective and objective measures of well-being in twenty-three European nations. Their findings indicate that more PERMA elements are associated with higher well-being (cf. Huppert & So, 2009).

The mechanism how well-being can contribute to positive short-term and long-term effects can be described via the broaden and build theory (Fredrickson, 2001). Positive emotions such as joy, interest, contentment and love can broaden an individual's momentary thought-action repertoire (Fredrickson, 2004) on the short term. Positive emotions promote discovery of new and creative ideas, actions or social bonds. Further, the build effect can help building personal resources ranging from social-, cognitive- and physical resources (Fredrickson, 2004) in the long term. Thus, people might benefit from positive emotions not only in the short term, but also in the long term, because it broadens people's mindsets and facilitates well-being (Fredrickson, 2009).

The two continua model explains mental health via two related but distinct dimensions, well-being and mental illness (Westerhof & Keys, 2010). Research indicates that well-being and mental illness combine in the two continua model to better describe a person's mental health than

either approach separately (Westerhof & Keyes, 2010). Mental health can therefore be viewed as a complete state, thus not only the absence of mental illness but also the presence of well-being (Keys, 2005). In other words, the mere absence of psychiatric disorder does not equal well-being.

In total, three different meta-analyses about PPIs have been conducted. The aim was to find a conclusion over the general effectiveness of PPIs for the general public, i.e. non-clinical (Sin & Lyubomirsky, 2009; Bolier, Haverman, Westerhof, Riper, Smit, Bohlmeijer, 2013). Sin and Lyubomirsky included a total of 49 controlled studies with a sample size of 4235 individuals. They tested the effectiveness of PPIs on well-being and depression. Their findings suggest that PPIs compared to control conditions are significantly more effective in increasing well-being ($r$ = .29) and decreasing depression ($r$ = .31). Bolier et al. (2013) used more stringent methodological and inclusion criteria, resulting in a selection of 39 randomized controlled studies with a sample size of 6139 individuals. They reported small but significant effects on subjective well-being (Cohen's $d$ = 0.34), psychological well-being (Cohen's $d$ = 0.20) and depression (Cohen's $d$ = 0.23) (Bolier et al., 2013; Chakhssi et al., 2017).

Between January 1998 and May 2017, Chakhssi et al. included thirty studies targeting clinical samples with a total sample size of 1864 participants in their meta-analysis. The results show that PPIs have the potential to both increase a person's well-being ($g$ = 0.24; 95% CI: 0.13 to 0.35, $p < 0.001$) and reduce depression ($g$ = 0.23, 95% CI: 0.11 to 0.34, $p < 0.001$), anxiety ($g$ = 0.36 (95% CI: 0.20 to 0.53, $p < 0.001$) and stress ($g$ = 0.27; 95% CI: -0.19 to 0.73, $p$ = .247) in a population with clinical disorders. Chakhssi et al. (2017) did not examine if the number of PERMA elements were related to higher effect sizes in outcome measures of well-being, depression, anxiety and stress.

Regarding the growing interest of PPIs within a clinical sample, this systematic literature review reviewed the effect of PPIs within a clinical sample with psychiatric disorders on well-being and distress. Further, the studies from the meta-analysis conducted by Chakhssi et al. (2017) were used to examine if the number of elements from the PERMA model present in the PPIs is related to higher effect sizes in outcome measures of well-being, depression, anxiety and stress.

## Sub-questions

In regard to the above described research questions, the following sub-research questions were formulated.

I. What characteristics do PPIs display in the treatment of psychiatric disorders within clinical samples?
II. What methodological characteristics do studies focusing on PPIs display in the treatment of psychiatric disorders within clinical samples?
III. What is the effectiveness of the PPIs on well-being and distress?
IV. What is the association between the sum of the PERMA elements with the effect sizes?

# Method

The study at hand followed the guidelines of a systematic literature review and meta-analysis (PRISMA). The method for the study at hand extrapolates on a previously conducted meta-analytic review (Chakhssi et al., 2017). The original data gathered by Chakhssi et al. (2017) concerning the methodological qualities and effect sizes are again recently gathered for the study at hand. A recent search was conducted to eventually include further studies.

## Search strategy and Databases

The databases PsycINFO, PubMed, Scopus and Google Scholar were used for the search process and the original search strategy by Chakhssi et al. (2017) was adjusted to clinical samples with psychiatric disorders. All search terms were related to 'well-being' and 'positive psychology' (Appendix A). These databases -using text word search terms, medical subject headings (PubMed) or thesaurus terms (PsycINFO) - were searched regarding their relation to 'well-being' and 'positive psychology'. Further, terms such as 'interventions' and 'outcome' were used within the search. Studies, that were previously used in the systematic review and meta-analysis by Chakhssi et al. (2017) were also used for the current study and cross-checked. The search was performed in October 2017.

## Inclusion and exclusion criteria

The inclusion of relevant studies was done by following the inclusion criteria from the previously conducted study by Chakhssi et al. (2017). First of all, studies which followed the tradition of the positive psychology were included. Therefore, only these studies were included that had a psychological intervention (i.e. training, exercise, therapy) which was meant to increase positive feelings, positive cognitions or positive behavior (Chakhssi et al., 2017; Sin & Lyubomirsky, 2009). Second of all, only studies with samples of adult participants, 18 years or older, that meet the criteria for a psychiatric disorder, according to the International Classification of Diseases and Related Health Problems (WHO, 1992). Fourth of all, all studies

used a control condition and fifth of all, an effect size or enough information to calculate an effect size had to be present within the studies.

Further, the exclusion of studies was done by following the exclusion criteria from the previously conducted study by Chakhssi et al. (2017). First of all, studies were excluded if they were not published in an English language peer-reviewed journal. If they made use of physical exercise to increase well-being. Additionally, studies were excluded if they focused on reminiscence, mindfulness and/or meditation(s) as these interventions have been examined in previous meta-analyses (cf. Bohlmeijer, Prenger, Taal, & Cuijpers, 2010; Bohlmeijer, Roemer, Cuijpers, & Smit, 2007; Gotink, Chu, Busschbach, Benson, Fricchione, & Hunink, 2015; Khoury, Lecomte, Fortin, Masse, Therien, Bouchard, Chapleau, Paquin, & Hofmann, 2013; Strauss, Cavanagh, Oliver, Pettman, 2014). Abstracts and/or study protocols that were unpublished were also excluded from the selection process.

## Data extraction

After reading the selected studies, relevant data were extracted. For the data collection, studies were screened based on their population characteristics, age, gender, disorder and sample size (per condition). Further, the intervention characteristics, like name of PPI, PPI component (s), target group, target age, goal, duration in weeks (with number of sessions), guidance (i.e. with or without therapist) were used for data extraction. The methodological characteristics -study design, participants per condition and dropout, assessment points (i.e. pre, post and/or follow up), outcome measures, results (including effect sizes) and the quality- were also used for extraction. To operationalize the PERMA model (c.f. Table 2) qualitatively, all used PPIs were screened and accordingly assigned to one or more of the five PERMA domains.

As an example, for the categorization Fava (2005) (Table 2) made use of the PPIs: 1) Report only on well-being episodes, 2) Automatic thoughts of decreasing well-being identified, 3) Mastery and pleasure tasks and exposure. By focusing on well-being episodes, the PPI can mainly trigger positive emotions, while other PERMA elements such as engagement or relationships may only randomly occur. The second PPI enhances the PERMA element meaning by identifying negative thought patterns and therefore making deeper connections between cognitive and emotional states, generating a meaningful connection thereof. Other PERMA

elements within the second PPI again are only randomly targeted such as relationships can occur within the negative thoughts, but do not necessarily do so. The third PPI meets four PERMA elements, positive emotions, engagement, meaning and accomplishments as pleasure tasks and exposure trigger positive emotions. As mastery and pleasure are discovered to be separate entities, meaning can be generated while the fulfillment of the tasks generates engagement and accomplishments. The PPIs did not incorporate the PERMA element relationships.

## Quality assessment

Regarding the methodological quality studies were rated on the Cochrane Collaboration's tool for assessing risk of bias (Higgins, Altman, Gøtzsche, Jüni, Moher, Oxman, Savović, Schulz, Weeks, Sterne, 2011) and the Jadad scale (Jadad, Moore, Carroll, Jenkinson, Reynolds, Gavaghan, McQuay, 1996). This rating consists of seven items (0 = "absent", 1 = "present"). Studies that receive the identification of "good" had the highest quality with a score of 7 points. Studies are rated as "fair" with five or six points and "poor" with four or less criteria points. The included items cover sequence generation and allocation concealment, blinding, incomplete outcome data (e.g. dropouts, and withdrawals), selective outcome reporting, group similarity at baseline, adequate sample size/power analysis, and reliability of the diagnostic assessment.

## Statistical power analyses using G*Power

To check for the adequacy of the sample sizes for the articles (cf. Appendix B) the power for the analyses is calculated by considering the design, α, the power (γ), sample size, and effect size of each study, and using G*Power. G*Power is an open source program for power analysis and sample size calculations. An adequate power is considered to be .80, α is always .05 (Faul, Erdfelder, Buchner, & Lang, 2009).

## Quantitative Analyses

All quantitative analyses (i.e. regarding sub-questions III & IV) were conducted with SPSS (Statistical Packages for the Social Sciences), version 24. Missing values are excluded casewise and per analysis. Via skewness, kurtosis and Shapiro-Wilk, normality of the effect sizes was

investigated. Due to low sample sizes outcome measure anxiety (n = 8) and stress (n = 5) the indication for eventually not-normal distributions are ignored and further results have to be handled with caution. For sub-questions III, the effect sizes were determined with Cohen's *d*, i.e. $\frac{\Delta Pre-Post_{\ experimental} - \Delta Pre-Post_{\ control}}{\sqrt{SD_{pooled}}}$ (*d* = 0.00 as small, *d* = 0.50 as medium, *d* = 1.00 as large and *d* = 2.00 as very large) (cf. Ruscio & Mullen, 2012). For sub-questions IV, Pearson's bivariate correlation coefficients were calculated and tested for statistical significance with a standard $\alpha = .05$.

# Results

## Selection of studies

The selection process of this literature review was conducted similarly to a previous study (cf. Chakhssi et al. 2017). In a first step (Figure 1) all containing research about PPIs and well-being were identified and duplications were removed. Two studies were extra identified through Google Scholar and added to the abstract review phase. In a second step a total of 241 abstracts were screened. In a third step, 102 full-text articles were assessed for eligibility. In a fourth step, 31 articles were included. Articles focusing on somatic disorders (n = 16) were excluded as these studies are examined in another literature review (Niewerth, 2018). Only articles focusing on psychiatric disorders (n = 15) were included (Appendix B). Six studies were conducted in the United States of America, three in the United Kingdom, two each in Germany and Italy, and one each on Iran and Canada.

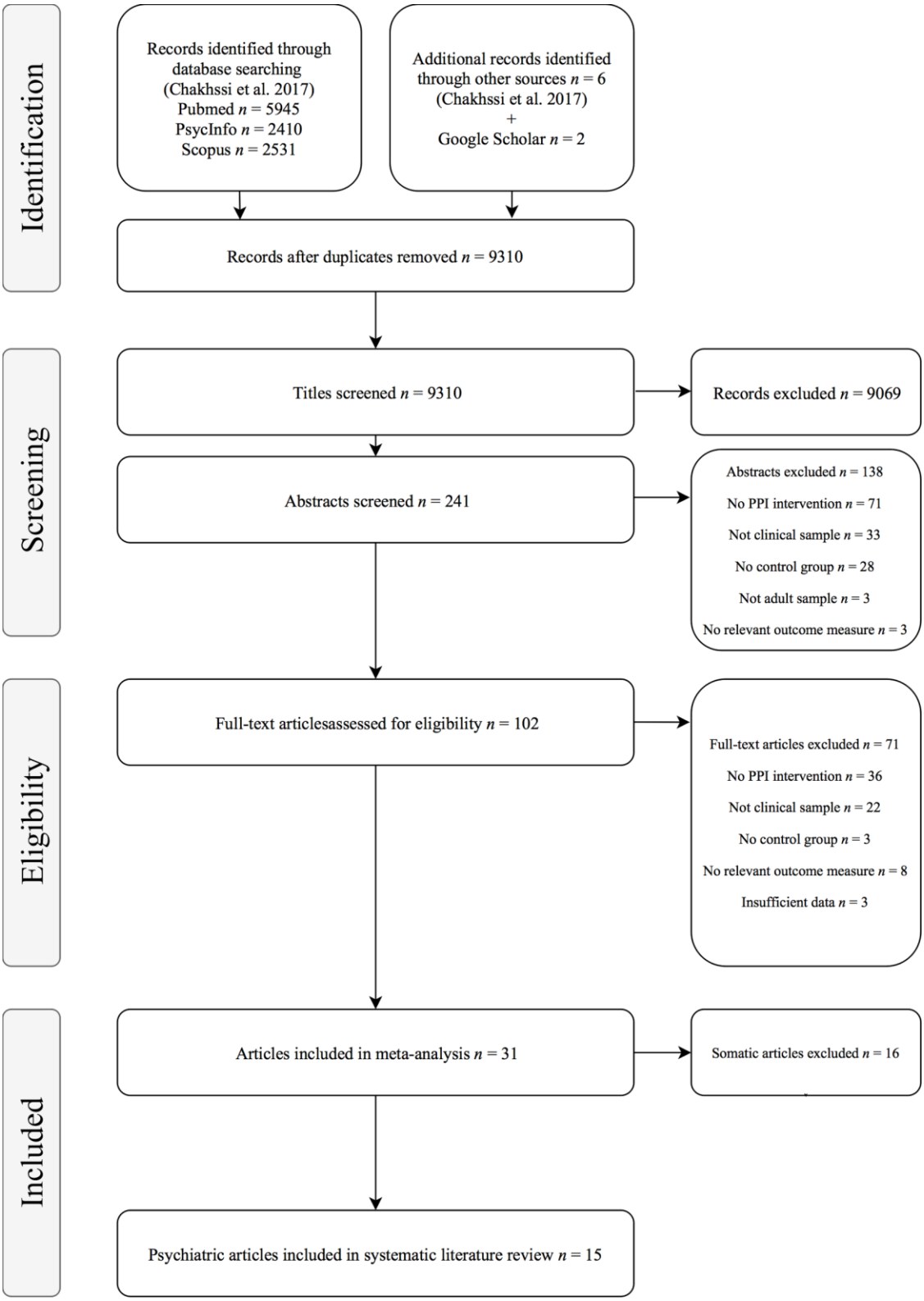


**Figure 1.** ***Flowchart of the study selection process (PRISMA, 2009).***

# Characteristics of PPIs

## *Population characteristics*

The target population were adult individuals having psychiatric disorders. Adding all participants together, a total of 950 adults were included in the studies. A total of 461 adults in the control condition and 489 in the PPI condition. The participants' age ranged between 18 and 68 years with a total mean age of 40.29. Psychiatric disorders were diagnosed via either the DSM-IV/V criteria (1; 2; 3 ;4; 5; 6; 7; 8a; 8b; 9; 11; 12; 13; 14; 15) or the International Neuropsychiatric Interview the MINI (10; 13). A broad range of psychiatric disorders was found. Depressive disorders were the most frequently diagnosed disorder (3; 4; 6; 7; 10; 11; 12). Followed by anxiety disorders (2; 14) and various mental health problems (8; 9). The target group of the disorders post-traumatic stress syndrome (5), affective disorders (1), psychosis (13) and paranoid ideation (15) were each once used within one study.

The vast majority of studies (cf. Table 2) compared two groups (mean = 42.8, range = [17; 96]) (1; 2; 4; 5; 6; 7; 8a; 8b; 9;10; 11; 12; 13; 14; 15). Only one study (3) compared three groups (n = 45), one group with a PPI, one group with a treatment as usual without medicine, and one group with a treatment as usual with medicine. G*Power analyses reveal that none of the studies had adequate sample size. The studies comparing two groups would need a sample size of 102 participants to achieve a power of 80%, at alpha 5%, and a medium effect size, the studies comparing three groups would need a sample size of 159 participants at the same power-relevant parameters.

## *Intervention characteristics*

A total of 15 studies were used for this systematic literature review (Appendix B). In the following, numbers 1-15 were ascribed to each of these 15 studies in the ongoing analyses. One study (Kerr, 2015) contained two different PPIs performed with two different groups. Each PPI was given the same number, while indexed as a or b. Table 1 outlines the intervention characteristics.

The duration of the interventions and number of sessions (Table 1) ranged from 1 day and 1 session (15) to 16 weeks with 8 sessions (1; 2). Three interventions (4; 5; 14) lasted 12 weeks with 12 sessions. Further, three interventions were implemented with a duration of 2

weeks and 14 sessions. Two interventions lasted for 10 weeks with 10 sessions (11; 13). All remaining interventions varied both in duration and number of sessions. Starting with 4 weeks with 3 sessions (7), 6 weeks with 6 sessions (10), 11 weeks with 12 sessions (12) and 12 weeks with 14 sessions (3). One intervention (6) was implemented over 5 weeks, with 0 sessions. The participants had to work individually over the 5 weeks. They received a telephone call after the end of the second week. At the end, participants were sent the outcome measures to complete and return by post (Coote & MacLeod, 2012). Summarizing, a broad range of intensity of the interventions can be found.

All interventions having a group format were guided by a professional. The remaining studies were individually delivered either guided by a professional (3; 10; 13) or unguided (6; 8a; 8b; 9). No group interventions were unguided, whereas individual interventions were equally distributed over guided and unguided.

### *Goal of the Interventions*

The general goal of the interventions (Table 1) was in line with positive psychology. Accordingly, the focus of these interventions was to improve well-being by increasing positive emotions, cognitions or behavior. Thereby targeting symptoms of depression, anxiety or stress to extend traditional treatment of psychiatric disorders within clinical samples. All interventions provided psychoeducation at baseline aiming to ensure sufficient knowledge about the disorder and the intervention procedure. Summarizing, the enhancement of well-being was the primary goal of the interventions, whereas no intervention had the primary goal of only symptom reduction.

**Table 1.**
***Intervention characteristics, components and goals***

| | First author (year) | Intervention Name (n) | Goal | PPI component(s) | Duration+ (sessions) | Format (Guidance) |
|---|---|---|---|---|---|---|
| 1 | Fava (1998) | Well-being therapy (10) | 1. Change beliefs and attitudes detrimental to well-being<br>2. Stimulate awareness of personal growth and recovery from affective illnesses<br>3. To reinforce well-being promoting behavior | 1. Rational emotive therapy<br>2. Fostering acceptance of symptoms | 16w (8) | Group (Yes) |
| 2 | Fava (2005) | Well-being therapy (10) | 1. Change beliefs and attitudes detrimental to well-being<br>2. Stimulate awareness of personal growth and recovery from affective illnesses<br>3. To reinforce well-being promoting behavior | 1. Report only on WB episodes in diary<br>2. Automatic thoughts of decreasing WB identified<br>3. Mastery & pleasure tasks + exposure to feared situations | 16w (8) | Group (Yes) |
| 3 | Seligman (2006) | Positive psychotherapy (11) | 1. Increase positive emotion, engagement and meaning | 1. Using Your Strengths<br>2. Three Good Things/Blessings<br>3. Obituary/Biography<br>4. Gratitude Visit<br>5. Active/Constructive Responding<br>6. Savoring | 12w (14) | Individual (Yes) |
| 4 | Asgharipoor (2010) | Positive psychotherapy (9) | 1. Increase pleasure, engagement and meaningfulness<br>2. Increase general subjective well-being | 1. Identify strengths<br>2. Appreciating positive affairs<br>3. Four lifestyles: Nihilism, pleasure-seeking, competition & happiness<br>4. Produce life map of pleasure & meaningful activities<br>5. Value list/hierarchy | 12w (12) | Group (Yes) |
| 5 | Kent (2011) | Resilience-Oriented Treatment (20) | 1. Bolster positive emotions and social bonds | 1. Awareness of positive emotions<br>2. Social connectedness<br>3. Develop emotional resources and strong social bonds | 12w (12) | Group (Yes) |
| 6 | Coote (2012) | Goal-setting and Planning (26) | 1. Think about positive goals and how to move towards these goals | 1. Think of self-concordant goals and how to achieve them<br>2. Identify obstacles & how to overcome them<br>3. How to maintain progress | 5w (0) | Individual (No) |
| 7 | Pietrowsky (2012) | Positive Psychology Interventions (9) | 1. Induce positive affect and minimize negative affect<br>2. Enhance optimism, gratefulness and happiness | 1. Best possible self-task<br>2. Three good things | 4w (3) | Group (Yes) |
| 8a | Kerr (2015) Group 1 | Gratitude Interventions (16) | 1. Increase gratitude to further stimulate improvements in psychological functioning (well-being) | 1. Counting gratefulness<br>2. Rate own gratitude intensity | 2w (14) | Individual (No) |
| 8b | Kerr (2015) Group 2 | Kindness Interventions (16) | 1. Increase kindness to further stimulate improvements in psychological functioning (well-being) | 1. Counting kindnesses<br>2. Rate own kindness intensity | 2w (14) | Individual (No) |
| 9 | Kentzman (2015) | Web-based gratitude exercise (11) | 1. Cultivate positive feelings, behaviors and cognition | 1. Three Good Things exercise | 2w (14) | Individual (No) |
| 10 | Celano (2016) | Positive Psychology Intervention (32) | 1. Promote psychological well-being by increasing optimism, gratitude, use of personal strengths and altruism | 1. Gratitude for positive events/Thee good things<br>2. Identifying & using personal strength<br>3. Gratitude letter<br>4. Enjoyable & meaningful activities<br>5. Leveraging past success<br>6. Acts of kindness or participants choice | 6w (6) | Individual (Yes) |

**Table 1. (continued)**
***Intervention characteristics, components and goals***

| | First author (year) | Intervention Name (n) | Goal | PPI component(s) | Duration[+] (sessions) | Format (Guidance) |
|---|---|---|---|---|---|---|
| 11 | Chaves (2016) | Positive Psychology Intervention (47) | 1. Increase well-being and satisfaction with life | 1. Identify positive emotions<br>2. Mindfulness exercise<br>3. Best possible self<br>4. Counting kindnesses<br>5. Self-compassion<br>6. Using one's signature strengths<br>7. Obituary/Biography Goal Setting<br>8. Resilience | 10w (10) | Group (Yes) |
| 12 | Schrank (2016) | Positive psychotherapy (47) | 1. Improve well-being by increasing positive experiences, amplifying strengths, fostering positive relationships and creating a more meaningful self-narrative | 1. Increasing positive experiences<br>2. Amplifying strengths<br>3. Fostering positive relationships<br>4. Creating a more meaningful self-narrative | 11w (11) | Group (Yes) |
| 13 | Taylor (2016) | Positive Activity Intervention (16) | 1. Increase positive emotions and psychological well-being | 1. Noticing & amplifying positive events<br>2. Counting one's blessings<br>3. Acts of kindness<br>4. Increasing positive experiences<br>5. Affirming values<br>6. Best possible future<br>7. Make someone else happier<br>8. Live this month like it's your last<br>9. Gratitude letter<br>10. Develop personalized positive activity plan<br>11. Termination plan | 10w (10) | Individual (Yes) |
| 14 | Uliaszek (2016) | Positive Psychotherapy (27) | 1. Enhance positive emotions, engagement, relationships, meaning and accomplishments | 1. Gratitude Journal<br>2. Real-life story of resilience<br>3. Signature strengths/ Values in Action model<br>4. Fostering positive relationships | 12w (12) | Group (Yes) |
| 15 | Ascone (2017) | Compassion-Focused Imagery Intervention (26) | 1. Create an image conveying warmth and compassion<br>2. Increase well-being | 1. Fostering (self-) compassion | 1d (1) | Group (Yes) |

Note. [*] WB = well-being [+] d = day(s), w = weeks, n = number of participants

# Methodological characteristics

In the following, the methodological characteristics including the design, the drop-outs, the assessment points, the outcome measures and the quality of the studies are presented (cf. Table 2).

### *Design*

Thirteen of the 15 studies used a randomized controlled trial [RCT] (1; 2; 3; 4; 5; 7; 8a; 8b; 9; 10; 12; 13; 14). Ten (1; 2; 4; 5; 7; 9; 10; 12; 13; 14) studies distributed their sample in two groups, whereas two studies (3; 8a; 8b) divided their sample in three groups. In one of these studies (3) the PPI group was also compared to a nonrandomized matched group receiving treatment as usual with antidepressant medications [TAUMED]. The third group was not randomized regarding the researchers doubts about the ethics and the scientific logic of assigning participants to medication regardless of their preferences for drugs or psychotherapy (Seligman, Rashid & Parks, 2006). Kerr et al. (8a; 8b) compared three groups with one another; one received a gratitude intervention, the second a kindness intervention, where the third received a mood-monitoring placebo. Besides, a cross-over design (6), a controlled clinical trial which was blindly evaluated and then allocated to two groups (11) and a repeated measure randomized design (15), were used for research. Summarizing, most studies had a randomized controlled trial design. Only three studies were either not randomized or did not control.

**Table 2.**
*Methodological characteristics*

| First author (year) | Study design | Participants per condition (N; Dropout) | Assessment points | Outcome measures related to 1) WB 2) DEP 3) ANX 4) S | Results (Effect size): WB | Results (Effect size): DEP | Results (Effect size): ANX | Results (Effect size): S |
|---|---|---|---|---|---|---|---|---|
| 1. Fava (1998) | Two-groups, RCT | Well-being therapy (10; 0)<br>CBT (10; 0) | Pre- and post-intervention | 1) Psychological Well-Being Scale<br>2) Paykel's Clinical Interview for Depression<br>3) Kellner's Symptom Questionnaire | | 1.8 | 0.51 | |
| 2. Fava (2005) | Two-groups, RCT | CBT+WBT (10; 0)<br>CBT (10; 0) | Pre- and post-intervention | 1) Ryff's Psychological Well-being Scale<br>2) Paykel's Clinical Interview for Depression<br>3) Kellner's Symptom Questionnaire | 1.11 | 1.8 | 2.53 | |
| 3. Seligman (2006) | Randomly assigned to PPT or TAU; Non Randomly assigned to TAUMED | Group PPT (13; 2)<br>Treatment as usual TAU (15; 6)<br>TAUMED (17; 5) | 1) Baseline 2) Posttest 3) Three-month follow-up 4) Six-month follow-up 5) One-year follow-up | 1) Positive Psychotherapy Inventory<br>2) Zung Self-Rating Scale | 1.26 | 1.22 | | |
| 4. Asgharipoor (2010) | Two-groups, RCT | Positive Psychotherapy (9; 0)<br>CBT (9; 0) | Pre- and post-every session | 1) Emotional well-being subscale<br>2) Beck Depression Inventory<br>3) Subjective Units of Distress scale | 1.00 | 0.28 | | -2.05 |
| 5. Kent (2011) | A preliminary randomized clinical trial | Intervention (20; 1)<br>Control (19; 2) | Pre- and post-intervention | 1) Ryff's Psychological Well-being Scale<br>2) Beck Depression Inventory<br>3) State-Trait Anxiety Inventory<br>4) Posttraumatic Stress Diagnostic | 1.30 | 1.25 | 1.02 | 1.40 |
| 6. Coote (2012) | Cross-over design | Goal-setting and Planning (26; 0)<br>Wait-list control group (29; 0) | Pre- and post-intervention + follow-up | 1) Positive Affect Scale<br>2) Centre for Epidemiological Studies-Depression Scale | 0.54 | 0.40 | | |

**Table 2. (continued)**
*Methodological characteristics*

| First author (year) | Study design | Participants per condition (N; Dropout) | Assessment points | Outcome measures related to 1) WB 2) DEP 3) ANX 4) S | Results (Effect size): WB | Results (Effect size): DEP | Results (Effect size): ANX | Results (Effect size): S |
|---|---|---|---|---|---|---|---|---|
| 7. Pietrowsky (2012) | RCT | Experimental group (9; 2)<br>Control group (8; 2) | Pre- and post-intervention | 1) Satisfaction with Life Scale<br>2) Beck Depression Inventory | -0.27 | 0.5 | | |
| 8a. Kerr (2015) Group 1 | Three groups, RCT | Gratitude (16; 0)<br>Control (15; 0) | Pre- and post-intervention | 1) Meaning in Life questionnaire<br>2) Depression Anxiety Stress Scale<br>3) Depression Anxiety Stress Scale<br>4) Depression Anxiety Stress Scale | 1.13 | 0.12 | 0.59 | 0.43 |
| 8b. Kerr (2015) Group 2 | Three groups, RCT | Kindness (16; 0)<br>Control (15; 0) | Pre- and post-intervention | 1) Meaning in Life questionnaire<br>2) Depression Anxiety Stress Scale<br>3) Depression Anxiety Stress Scale<br>4) Depression Anxiety Stress Scale | 0.81 | -0.13 | 0.80 | 0.43 |
| 9. Kentzman (2015) | Mixed-methods randomized controlled study | Three Good Things (11; 0)<br>Placebo (12; 1) | Pre- and post intervention + 2x follow-up | 1) Positive Affect Subscale | 1.81 | | | |
| 10. Celano (2016) | A Single-blind, two-site Randomized Controlled Trial | PP (32; 3)<br>CF (33; 4) | Baseline, 6 weeks post, 12 weeks post | 1) Positive Affect Schedule<br>2) Quick Inventory of Depressive Symptomatology, Self-Report | 0.53 | -1.00 | | |
| 11. Chaves (2016) | Controlled Clinical Trial blindly evaluated and then allocated to groups | PPI (47; 8)<br>CBT (49; 15) | Pre-and post intervention | 1) Satisfaction with life<br>2) Beck Depression Inventory<br>3) Beck Anxiety Inventory | 0.41 | 0.96 | 0.54 | |
| 12. Schrank (2016) | RCT | Experimental: (47; 4)<br>Control (47; 6) | Pre- and post intervention + follow-up | 1) Warwick-Edinburgh Mental Well-Being Scale<br>2) Short Depression-Happiness Scale | 0.15 | 0.38 | | |

**Table 2. (continued)**
*Methodological characteristics*

| First author (year) | Study design | Participants per condition (N; Dropout) | Assessment points | Outcome measures related to<br>1) WB<br>2) DEP<br>3) ANX<br>4) S | Results (Effect size): WB | Results (Effect size): DEP | Results (Effect size): ANX | Results (Effect size): S |
|---|---|---|---|---|---|---|---|---|
| 13. Taylor (2016) | RCT | PAI group (16; 1)<br>Waitlist group (13; 1) | Pre- and post intervention + 3 month follow-up + 6 month follow-up | 1) Satisfaction with life Scale<br>2) Beck Depression Inventory<br>3) Spielberger State-Trait Anxiety Inventory | 1.73 | 1.3 | 0.3 | |
| 14. Uliaszek (2016) | RCT | PPT group (27; 12)<br>DBT group (27; 4) | Pre- and post intervention | 1) Positive Psychotherapy Inventory<br>2) Symptom Checklist-90- Depression subscale<br>3) Symptom Checklist-90- Anxiety subscale<br>4) Distress Tolerance Scale | 0.26 | 0.33 | 0.44 | 0.38 |
| 15. Ascone (2017) | Repeated Measures Randomized Design | Experimental group (26; 0)<br>Control group (25; 0) | Pre- and post intervention | 1) Positive self-rating Self-Compassion Scale<br>2) Inadequate Self subscale & Hated Self subscale | 0.97 | 2.13 | | |

Note. Cognitive Behavior Therapy (CBT), Cognition Focused (CF), Dialectical Behavior Therapy (DBT), Effect Size (d), Goal-setting and Planning (GAP), Positive Activity Intervention (PAI), Positive Psychology (PP), Positive Psychology Intervention (PPI), Positive Psychotherapy (PPT), Randomized Controlled Trial (RCT), Treatment As Usual (TAU), Treatment As Usual plus Medicine (TAUMED), Well-Being Therapy (WBT),

## *Dropout*

In regard to the highest number of respondents leaving a study, the study conducted by Chaves et al. (11) recorded 23 dropouts. The study with the highest percentage of dropouts is Uliaszek et al. (14). This study recorded a loss of 29.6% which left a remaining sample of 38 respondents.

Studies containing a follow-up assessment, all but one (6), recorded dropout rates (3; 9; 10; 12; 13). The studies (5; 7; 11; 14) had no follow-up, but recorded the highest percentages of dropout, range = {7.7; 29.6}. The remaining studies (1, 2, 4; 6; 8a; 8b; 15) recorded no dropouts. Kentzman et al. (9) made use of two follow-ups, having one dropout within the control group. Summarizing, the adherence seems to be low in half of the studies; the other half reported no dropouts.

## *Assessment points*

To ensure long-lasting effects of the intervention, five studies (6; 9; 10; 12; 13) also assessed outcomes in the long term. Two studies (6; 12) had one follow-up assessment, three studies (9; 10;

13) had two follow-up assessments. Seligman et al. (3) assessed at four-time points. At baseline, post intervention, three months follow-up and six months follow-up. Asgharipoor et al. (4) had a total of 12 assessment points. During this study, assessment took place after every session. The remaining studies (1; 2; 5; 7; 8a; 8b; 11; 14; 15) assessed at pre- and post-treatment. Summarizing, half of the studies assessed during follow-ups; the other half assessed at pre- and post-treatment.

### *Outcome measures*

The outcome measures were related to 1) well-being, 2) depression, 3) anxiety and 4) stress (Table 2). Measures most often used for well-being were the psychological well-being scale [PWB] (1; 2; 5) and the satisfaction with life scale [SWLS] (7; 11; 13). For the majority of studies, the Beck Depression Inventory [BDI-II] was used to assess symptoms of depression (4; 5; 7; 11; 13). Anxiety was most often measured using the Kellner's Symptom Questionnaire for Anxiety [SQ-A] (1; 2) or the Spielberger State-Trait Anxiety Inventory [STAI] (5; 13). Five of the 15 studies measured the category stress. Measurements used were the Depression Anxiety Stress Scale [DASS-S] (8a; 8b) or the Subjective Units of Distress Scale [SUDS] (4). The used measurement instruments that were related to these four categories were all standardized, valid and reliable.

### *Quality of the studies*

In regard to the quality scores of the studies (cf. Table 3), the label "unclear" was used in cases where the criterion was rated as not satisfied. The label "Yes" or "No" was used when the study did or did not meet the criterion. None of the studies was of high quality. The majority was of poor quality (1; 2; 3; 4; 5; 6; 7; 8a; 8b; 9) followed by fair quality (10; 11; 12, 13; 14; 15). The criterion of adequate allocation sequence generation and allocation concealment was most poorly rated with five studies meeting this criterion. The most highly rated criterion was that of the diagnostic was conducted by a professional whereby only the study carried out by Coote et al. (6) did not meet this criterion. No differences were observed in regard to the quality assessment conducted by Chakhssi et al. (2017).

**Table 3.**
***Methodological quality of studies***

| First author (year) | 1. Adequate allocation sequence generation and allocation concealment | 2. Blinding of main outcome assessments | 3. Description of withdrawals/drop-outs | 4. Intention-to-treat analysis is performed or there are no drop-outs | 5. The sample size is based on an adequate power analysis | 6. The groups are similar on prognostic indicators at baseline (and this was explicitly assessed) or adjustments were made to correct for baseline imbalance (using appropriate covariates) | 7. Diagnostic assessment was conducted by a professional, or there were no diagnostic assessments necessary for the recruitment | Score |
|---|---|---|---|---|---|---|---|---|
| 1. Fava (1998) | Unclear | Yes | Yes | Yes | No | Unclear | Yes | 4 |
| 2. Fava (2005) | Unclear | Yes | No | No | No | Unclear | Yes | 2 |
| 3. Seligman (2006) | Unclear | Yes | Yes | No | No | Yes | Yes | 4 |
| 4. Asgharipoor (2010) | Unclear | No | Unclear | Unclear | No | Yes | Yes | 2 |
| 5. Kent (2011) | Unclear | Unclear | Yes | Yes | No | Yes | Yes | 4 |
| 6. Coote (2012) | Unclear | Yes | No | No | Yes | Yes | No | 3 |
| 7. Pietrowsky (2012) | Unclear | No | No | Yes | No | Yes | Yes | 3 |
| 8a. Kerr (2015) Group 1 | Unclear | Unclear | Yes | Yes | No | Yes | Yes | 4 |
| 8b. Kerr (2015) Group 2 | Unclear | Unclear | Yes | Yes | No | Yes | Yes | 4 |
| 9. Kentzman (2015) | Unclear | Yes | No | No | No | Yes | Yes | 3 |
| 10. Celano (2016) | Yes | Yes | No | Yes | Yes | Yes | Yes | 6 |
| 11. Chaves (2016) | Unclear | Yes | Yes | Yes | Yes | Yes | Yes | 6 |
| 12. Schrank (2016) | Yes | No | Yes | Yes | Yes | Yes | Yes | 6 |
| 13. Taylor (2016) | Yes | Unclear | Yes | Yes | No | Yes | Yes | 5 |
| 14. Uliaszek (2016) | Yes | No | No | Yes | Yes | Yes | Yes | 5 |
| 15. Ascone (2017) | Yes | Yes | Yes | Yes | Unclear | Yes | Yes | 6 |

## Effectiveness of the PPIs on well-being and distress

All studies provided sufficient information for an indication of the effectiveness (Table 2) of the used PPIs. In the following the effects related to the positive psychological process well-being are described at first. Afterwards, the psychopathological symptoms, depression, anxiety and stress are discussed.

Most studies had large (2; 3; 4; 5; 8a; 9; 13) or medium (6; 8b; 10; 15) effect sizes. Three studies (11; 12; 14) displayed small effect sizes regarding the positive psychological process of well-being ($d$ = 0.41; $d$ = 0.15; $d$ = 0.26). One study reported a small negative effect size for the PPI condition (7) ($d$ = -0.27). Well-being was not affected by time or treatment (7). The control condition outperformed the PPI once, (Celano et al., 2016) (10). Compared to the PPI, the control condition was associated with significant greater improvements ($\beta$ = -3.15, 95% CI = {-6.18; -0.12}, $d$ = -0.84, $p$ = 0.04) at 6 weeks follow-up.

Although, a broad range of different psychiatric disorders was used for the study at hand, psychopathology was measured by the symptoms of depression, anxiety and stress (Table 2). Six studies reported high reductions of depression in the PPI groups (1; 2; 3; 5; 13; 15), medium effect sizes were reported in two studies (7; 11). Five studies reported small (4; 6; 8a; 12; 14) effect sizes and two displayed negative effect sizes (8b; 10). The PPI condition once (10) resulted into a reverse effect ($d$ = -1.00) for the depressed clients. One study (9) did not measure depression. Anxiety was measured by eight studies, displaying very large (2) ($d$ = 2.53) large (5) ($d$ = 1.02), medium (1; 8a; 8b; 11) or small (13; 14) ($d$ = 0.3; $d$ = 0.44) effect sizes. The remaining eight studies did not measure anxiety. The psychopathological symptom of stress was measured by five studies. One study reported a high effect size (5) ($d$ = 1.40), three studies displayed small effect sizes (8a; 8b; 14) ($d$ = 0.43; $d$ = 0.43; $d$ = 0.38), whereas one study (4) reported a high negative effect size (4) ($d$ = -2.05). The remaining eleven studies did not measure the psychopathological symptom of stress within their studies.

Summarizing, for increasing well-being 14 of the 15 studies reported small to large effect sizes (range = [0.15; 1.81]), 13 of the 15 for symptom reduction of depression (range = [0.12; 2.13]), 8 out of 8 for anxiety (range = [0.30; 2.53]) and 4 out of 5 for stress (range = [0.38; 1.40]). Most of

the studies displayed an increase in well-being and a reduction of pathological symptoms in the PPI conditions. One study (10) reported a reverse effect on the participants' depressive symptoms while using PPIs.

## PERMA elements in PPI

The PPI-components used within the interventions (cf. Table 1) were categorized according the five elements of Martin Seligman's well-being theory (PERMA) (Seligman, 2010) (Table 4). The PERMA element meaning is the most frequently appearing element (present in 16 studies), followed by engagement (present in 10 studies) and positive emotions (present in 10 studies). Relationships (present in 7 studies) and accomplishments (present in 6 studies) are the least often appearing elements within the PPI components.

**Table 4.**
***Five elements of Seligman's well-being theory (PERMA)***

| First author (year) | Positive emotions | Engagement | Relationships | Meaning | Accomplishments |
|---|---|---|---|---|---|
| 1. Fava (1998) | 0 | 0 | 0 | 1 | 0 |
| 2. Fava (2005) | 1 | 1 | 0 | 1 | 1 |
| 3. Seligman (2006) | 1 | 1 | 1 | 1 | 1 |
| 4. Asgharipoor (2010) | 1 | 1 | 1 | 1 | 0 |
| 5. Kent (2011) | 1 | 0 | 1 | 1 | 0 |
| 6. Coote (2012) | 0 | 1 | 0 | 1 | 0 |
| 7. Pietrowsky (2012) | 1 | 1 | 0 | 1 | 1 |
| 8a. Kerr (2015) Group 1 | 0 | 0 | 0 | 1 | 0 |
| 8b. Kerr (2015) Group 2 | 0 | 0 | 0 | 1 | 0 |
| 9. Kentzman (2015) | 1 | 0 | 0 | 1 | 1 |
| 10. Celano (2016) | 1 | 1 | 1 | 1 | 1 |
| 11. Chaves (2016) | 1 | 1 | 0 | 1 | 0 |
| 12. Schrank (2016) | 1 | 1 | 1 | 1 | 0 |
| 13. Taylor (2016) | 1 | 1 | 1 | 1 | 1 |
| 14. Uliaszek (2016) | 0 | 1 | 1 | 1 | 0 |
| 15. Ascone (2017) | 0 | 0 | 0 | 1 | 0 |

*Note*. 1 = present, 0 = absent.

### *Bivariate correlations of effect sizes and sum of PERMA elements*

The parametric Pearson Correlation was used to check for an eventual connection between the sum of the PERMA elements and the effect sizes. For no outcome measure was the sum of the PERMA associated with the effect size: well-being, $r = .294$, $p = .287$, depression, $r = -.256$, $p = .356$, anxiety, $r = -.296$, $p = .476$, stress, $r = -.701$, $p = .187$.

# Discussion

The present study set out to examine the effects that PPIs have on well-being and distress in a clinical sample with psychiatric disorders and pioneered in categorizing PPIs with the five PERMA elements (Seligman, 2010). The results suggest that PPIs improve to a great extent well-being in a clinical sample. Half of the studies report high effect sizes; one study reported a reverse effect. Further, the results display high effect sizes in the reduction of depressive symptoms in half of the included studies, whereas one study (Celano et al., 2016) reported PPIs might produce a reverse effect. Medium to small effect sizes were found in the reduction of anxiety and stress.

Seven studies reported high effect sizes for the PPIs on well-being (cf. Bolier et al., 2013; Chakhssi et al., 2017). PPIs such as three good things, using/identify your strengths or counting gratefulness (cf. Table 1) seem to help people with psychiatric disorders. Clinical patients experience underdeveloped well-being where PPIs can have greater effects due to higher improvement potential than in a non-clinical person (cf. Schrank et al., 2016), which might be an enormous potential for psychotherapy. PPIs can be included into normal treatment and might improve well-being of patients with psychiatric disorders (Wong, 2016).

The finding that four studies found no effect and one study found an adverse effect of PPIs could be explained by instructions too difficult for patients to follow. Patients with psychiatric disorders tend to focus on the disorders/problems, where re-focusing on positives (that may be lacking) may seem too difficult (cf. Seligman & Csikszentmihaly, 2000). The necessary energy needed to follow PPIs may not be consistently available (Celano et al., 2016). It seems to be important to be aware of the patient's therapy history before implementing a PPI (cf. Stewart, 1995). Yet, the results might also suggest that PPIs are not consistently useful in all cases and could possibly not be compatible with all forms of therapy (Celano et al., 2016;

Hervás, 2017). Experiencing intensive positive emotions was also associated with poorer life satisfaction (Diener, Sandvik, & Pavot, 1991) and a vulnerability to mania (Johnson, 2005; Gruber, 2011). It seems to be relevant not to erase common therapy methods (Hervás, 2017), but rather see the PPIs as a possibility to supplement it (Seligman et al., 2005).

Nevertheless, this systematic literature review outlines high effect sizes in the reduction of depressive symptoms in half of the PPI conditions. Anxiety was used less often as an outcome measure, yet most studies reported medium effects in a reduction of anxiety. A reduction of stress was also found attributable to the PPIs. These findings are interesting considering that PPIs are typically not used for a reduction of psychiatric disorders but rather for increasing positive psychological processes (Sin & Lyubomirsky, 2009). However, promoting the experience of positive psychological processes such as positive emotions seem to mitigate the adverse effects of negative emotions (cf. Fredrickson et al., 2000). Further, improving positive emotions helps patients to be more resilient and cope with their disorders (Fredrickson et al., 2003). Yet, one study reported patients that experience ongoing symptoms of depression, including suicidal risks, might also be at a high risk of experiencing adverse effects while using PPIs (Celano et al., 2016). It seems that these patients could have difficulty identifying with positive aspects of themselves or their lives. While being asked to focus on positive feelings (e.g. gratitude or three good things) these patients might only perceive the discrepancy between the positive ideation and their current negative reality (cf. Joormann, Siemer & Gotlib, 2007). Thus, even if for most people in most situations PPIs have beneficial effects, an increase in positive psychological processes such as positive emotions should not result into inhibiting negative emotionality (Hervás, 2017). Negative emotions seem to have a high adaptive value and should not be forgotten in the treatment of patients with psychiatric disorders (Hervás, 2017).

The present study further examined if the number of elements from the PERMA model (Seligman, 2011) present in the PPIs is related to higher effect sizes in the outcome measures of well-being, depression, anxiety and stress. The element meaning is the most frequently appearing PERMA element, followed by engagement and positive emotions, while relationships and accomplishments are the least often appearing PERMA elements within the PPIs. It could be argued that meaning, engagement and positive emotions are most readily associated elements of positive psychology or more easily targeted by a PPI. Targeting relationships and accomplishments may be especially cumbersome for a clinical group as these may be very

limited in experiencing these (cf. Celano et al., 2016). For a clinical group, focusing on relationships and accomplishments may be too burdensome, because these patients may struggle with low energy or interest for significant interpersonal contact (Celano et al., 2016).

For no outcome measure was the sum of the PERMA elements within an intervention associated with an increase or decrease of the effect size. According to Seligman (2011), the five PERMA elements are meant to be "the best approximation of what humans pursue for their own sake". It could be argued that the five PERMA elements might not incorporate all elements that individuals would freely choose for their own sake (Winton, 2011). As different individuals might have different values, they might also choose different things or elements for different reasons (Winton, 2011). Even if the connection between more PERMA elements resulting in possible higher effect sizes seems plausible, the PERMA model might be a paradigm to describe well-being, but not a necessity for functioning PPIs per se.

The operationalization of the PERMA model that was chosen in the present study may be flawed as the binary coding into present and absent may not reflect the actual therapeutic potential of the PERMA element. For instance, the therapeutic potential of the element positive emotions may gradually differ between the PPIs. The PPI Three Good Things Exercise (9) contains the PERMA element positive emotions and displayed the largest positive effect on well-being, while the PPI Increasing Positive Experiences (12) also contains the PERMA element positive emotions but displayed the smallest positive effect on well-being. The Three Good Things Exercise (9) is an undemanding, easy to follow task that can be accomplished in a few minutes by recapitulating the day and noting down – therefore possibly reliving – three good things that happened that day. Contrastingly, the Increasing Positive Experiences (12) tasks the patient with increasing effort while making positive experiences, possibly overstraining the already low energy of the patients (cf. Celano, 2016). This gradual difference between the quality of the PERMA elements within the PPIs may reveal further insights into the mechanisms of what works and what does not for the clinical population.

Another finding suggests that the format of the PPIs is rather heterogeneous. The included studies reported varying durations of the used PPIs. This variation of the duration of the used PPIs seems to even cause conflicting results of two different meta analyses (Bolier et al., 2013; Chakhssi et al., 2017). Bolier et al. (2013) outlined that longer duration is characterized with larger effect sizes, whereas Chakhssi et al. (2017) did not confirm this finding. Whether

duration of PPI predicts its effectiveness is not clearly answered yet. Future research might also include new approaches such as fractional factorial designs to uncover insights into which duration works best for a clinical sample (Guns & Mason, 2009).

Individual interventions existed guided as well as unguided, whereas group interventions only existed in guided form. That there are no unguided group interventions seems to be a missed opportunity possibly due to perceived dangers of letting a group self-determine how they conduct a PPI. Especially within a clinical context an unguided group, PPI may not only be ineffective but rather have unforeseeable consequences for the participants. PPIs are meant to assist normal treatment (Seligman et al., 2005), therefore research is trying to verify its usability as a guided and an unguided method, whereas the unguided method is – so far – limited to individual application. Maybe unguided group interventions can be developed, after enough insights about the function of PPIs in individuals and guided groups are gathered.

According to Seligman et al. (2005) using multiple PPIs at the same time should increase effectiveness. The included studies made use of a broad range of different PPIs resembling a shotgun approach (Sin & Lyubomirsky, 2009). However, the present study could not confirm this suggestion. More PERMA elements, resembling more PPIs, were not related to higher effect sizes.

The findings indicate a need for improvement within the research methodology and reporting in the field of PPIs. All used studies were of low or medium quality. Yet, the quality score of the studies could have been underestimated. The present literature review validates the data of the meta-analysis by Chakhssi et al. (2017). Yet, the more recent studies were of higher quality which might indicate that research methodology in the field of PPIs is improving as most studies had a randomized control trial design. Only three studies were either not randomized or did not control. One study used a cross-over design (6), which is more effective than a parallel design when the sample is small (Hussey & Hughes, 2007). Further, a cross-over design can attain the same level of statistical power as a parallel design (cf. Hussey & Hughes, 2007). Another study used a controlled clinical trial included blind evaluations and then allocated to two groups (11). In clinical trials, the blinding can serve as a more effective method, because when evaluating the PPI, placebo effects, observer bias or conscious deception can be prevented (cf. Day & Altman, 2000). The third study (15) used a repeated measure randomized design. The main advantages of a repeated measures design can be that it tests with more precision

determined by variation within the same participant (cf. Ende, 2001). Accordingly, it does not mean that these three studies are of lower quality but try to avoid biases.

None of the studies had adequate power. Small sample sizes are vulnerable to sampling biases. The sample sizes might not be representative of the target population and further the outcome must be interpreted with caution, because the effects of the treatment method might be over- or underestimated (Cuijpers, van Straten, Bohlmeijer, Hollon & Andersson, 2010; Taylor et al., 2017). Further, the difficulties with acquiring bigger samples could be attributed to the fact that research on PPIs with clinical samples is still very young (Owens & Patterson, 2013) and that people with psychiatric disorders might not be willing to test novel treatments, because they may struggle with low energy or interest (cf. Celano et al., 2016). They may rather want the best possible and validated treatment available.

More than half of the studies reported a low adherence. A low adherence could hint at a bias which could skew the results (Adams, Soumerai, Lomas & Ross-Degnan, 1999). The low adherence could possibly be due to a lack of guidance especially in the unguided, individual PPIs (cf. Christensen, Griffiths & Farrer, 2009; Schueller, 2010). While in large groups, a lack of personality match could account for the low adherence (Bolier et al., 2013). Further, PPIs are only recently implemented for clinical populations and might not be attuned to the needs of this population yet. Clinical patients may be unable to follow instructions well individually, process information and may have negative cognitive heuristics negatively impacting their adherence to the PPIs (Bless & Fiedler, 2006; Celano et al., 2016). It could be argued that a well-organized structure and positive reinforcement may be necessary to achieve high levels of adherence and its associated benefits (Krentzman, 2015).

## Strength and Limitations

This systematic literature review combines different data and provides an adequate overview of the research of PPIs on well-being and psychiatric symptoms in clinical samples with psychiatric disorders. An important strength was the stringent collection criteria, allowing repetition and validation. Further, the methodological quality was assessed and included in the analyses, lending insights into developments of research methods in the field. Using the PERMA model to

categorize and operationalize the PPI components seems to be a pioneering attempt within research on PPIs within clinical samples.

Another important strength was added by G*Power analyses providing insights into the power of the designs. It was revealed that many studies did not achieve an adequate sample size for their respective research design. It may be questioned whether unpublished work may have found effects if the designs had adequate power, regarding the reported articles did not have adequate power and yet found effects.

A limitation to the generalizability of the study at hand is the low number of available articles (N = 15). For a broader interpretation of PPIs in a clinical context for patients with psychiatric disorders, this amount may be insufficient. However, the stringent inclusion criteria and therefore the reduction of the number of all possible articles may have provided the most adequate articles for targeting the research questions of the study at hand. PPIs in clinical samples are still a novel research focus and may not yet provide enough support for bolder statements than the tentative indications that the study at hand found. Additionally, the outcome measures anxiety and stress were found with low frequency within the used studies. All findings considering these outcome measures must be viewed with caution, due to the lower data quantity.

All studies provided sufficient information for an indication of the effectiveness of the used PPIs, although most effect sizes had to be calculated by the researcher of the study at hand. It is recommended to list the effect sizes of the outcomes in the study, even if they were not convenient (Sullivan & Feinn, 2012). Otherwise the effectiveness of the PPIs could have been overestimated (Cuijpers et al., 2010) if standard parameters are not used to guide the interpretations.

Finally, the way both positive and negative emotions are measured is a little different in every study (Fredrickson, 2013). This could impair all gathered results and an error-free advice for an optimal rate of positive emotions within one intervention for a clinical sample with psychiatric disorder is far from perfect.

# Conclusion

This systematic literature review demonstrates that PPIs are innovative and for many patients with psychiatric disorders effective. They appear to increase well-being and reduce symptoms of depression, anxiety and stress in clinical populations with psychiatric disorders. PPIs have an enormous potential, yet, this does not mean that PPIs are sufficiently explored, but like any other psychological intervention, they also might create adverse effects. Further, the PERMA model appears to be a fitting paradigm to describe well-being but is not a necessity for the function of PPIs in clinical samples. It may be time to explore the applicability of PPIs as complementary programs to psychotherapy by practitioners to garner more practical insights and further the scientific efforts.

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# Appendix A: Search strategy

Search strategy: Scopus

#1 TITLE-ABS-KEY(({well-being} OR {wellbeing} OR {well being} OR happiness OR happy OR {life satisfaction} OR {satisfaction with life} OR {positive psych*} OR {positive emotion*} OR {positive feeling*} OR {positive cognition} OR {positive behavio*} OR compassion OR optimism OR gratitude OR kindness)

#2 TITLE-ABS-KEY(intervention* OR therap* OR treatment* OR training* OR program* OR exercise)

#3 TITLE-ABS-KEY(symptom* OR disorder* OR illness* OR disease* OR impairment OR clinic*)

#4 TITLE-ABS-KEY(effect* OR effic* OR outcome* OR evaluat*)

#5 TITLE-ABS-KEY(random* OR RCT* OR control* OR non-random* OR pilot* OR condition)

#6 #1 AND #2 AND #3 AND #4 AND #5 (filters: English, article, limit to subject area psychology and social sciences)

Search strategy: PubMed

#1 ("well-being"[tiab] OR happiness OR happy OR “life satisfaction”[tiab] OR “satisfaction with life”[tiab] OR "positive psychology"[tiab] OR "positive emotion"[tiab] OR "positive feeling"[tiab] OR "positive cognition"[tiab] OR "positive behavior"[tiab] OR "positive behaviour"[tiab] OR compassion[tiab] OR optimism[tiab] OR gratitude[tiab] OR kindness [tiab])

#2 (Happiness[Mh] OR Positive Psychology[Mh] OR Well Being[Mh] OR Optimism[Mh] OR Life Satisfaction[Mh] OR Compassion[Mh] OR Optimism[Mh])

#3 (intervention*[tiab] OR therap*[tiab] OR treatment*[tiab] OR training*[tiab] OR program*[tiab] OR exercise[tiab])

#4 (Therapy[Mh] OR Psychotherapy[Mh] OR Training[Mh] OR Exercise[Mh])

#5 (symptom*[tiab] OR disorder*[tiab] OR illness*[tiab] OR disease*[tiab] OR impairment[tiab] OR “clinical sample”[tiab])

#6 (disorder[Mh] OR disease[Mh] OR clinical psychology[Mh])

#7 (effect*[tiab] OR effic*[tiab] OR outcome*[tiab] OR evaluat*[tiab])

#8 (random*[tiab] OR RCT*[tiab] OR control*[tiab] OR non-random*[tiab] OR pilot*[tiab] OR condition[tiab])

#9 #1 OR #2

#10 #3 OR #4

#11 #5 OR #6

#12 #9 AND #10 AND #11 AND #7 AND #8 (filters: English, Adults)

Search strategy: PsycINFO

#1 ("well-being" OR happiness OR happy OR “life satisfaction” OR “satisfaction with life” OR "positive psych*" OR "positive emotion*" OR "positive feeling*" OR "positive cognition" OR "positive behavio*" OR compassion OR optimism OR gratitude OR kindness)

#2 (DE “optimism” OR DE “well being” OR DE “life satisfaction” OR DE “happiness” OR DE “positive psychology” OR DE “gratitude”)

#3 (intervention* OR therap* OR treatment* OR training* OR program* OR exercise)

#4 (DE “Intervention” OR DE “Therapy” OR DE “Psychotherapy”)

#5 (symptom* OR disorder* OR illness* OR disease* OR impairment OR “clinical sample”)

#6 (DE “Symptoms” OR DE “Disorders” OR DE “Clinical Psychology”)

#7 (effect* OR effic* OR outcome* OR evaluat*)

#8 (random*OR RCT* OR control* OR non-random* OR pilot* OR condition)
#9 #1 OR #2
#10 #3 OR #4
#11 #5 OR #6
#12 #9 AND #10 AND #11 AND #7 AND #8 (filter: academic journals, adults, English)'

# Appendix B: Literature Corpus


1. Fava, G. A., Rafanelli, C., Cazzaro, M., Conti, S., Grandi, S. (1998). Well-being therapy. A novel psychotherapeutic approach for residual symptoms of affective disorders. *Psychol Med*, 28(2), 475-480.

2. Fava, G. A., Ruini, C., Rafanelli, C., Finos, L., Salmaso, L., Mangelli, L., Sirigatti, S. (2005). Well-being therapy of generalized anxiety disorder. *Psychother Psychosom*, 74(1), 26-30.

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13. Taylor, C. T., Lyubomirsky, S., Stein, M. B. (2017). Upregulating the positive affect system in anxiety and depression: Outcomes of a positive activity intervention. *Depress Anxiety*, *34*(3), 267-280.

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