

The effects of psychological meaning-centered therapies on quality of life and psychological stress: A metaanalysis

JOËL VOS PH.D., AND DIEGO VITALI, M.SC.

Counselling Psychology, Department of Psychology, University of Roehampton, London, United Kingdom

(RECEIVED September 6, 2017; ACCEPTED September 7, 2017)

ABSTRACT

Objective: Many psychotherapists speak with clients about meaning in life. Meaning is an neutral evidence-based term for a subjective sense of purpose, values, understanding, self-worth, action-directed goals, and self-regulation. Since little is known about its effectiveness, our study aimed to determine the effects of meaning-centered therapies (MCTs) on improving quality of life and reducing psychological stress.

Method: Independent researchers selected and scored articles in multiple languages in multiple search engines. Weighted pooled mean effects were calculated following a random-effects model. Sensitivity analyses included moderators, study and sample characteristics, risk of bias, randomization, types of MCT, control condition, and outcome instruments.

Results: Some 52,220 citations included 60 trials (total sample $N = 3,713$), of which 26 were randomized controlled trials ($N = 1,975$), 15 nonrandomized controlled trials ($N = 709$), and 19 nonrandomized noncontrolled trials with pre/post measurements ($N = 1,029$). Overall analyses showed large improvements from baseline to immediate posttreatment and follow-up on quality of life (Hedges' $g = 1.13$, $SE = 0.12$; $g = 0.99$, $SE = 0.20$) and psychological stress ($g = 1.21$, $SE = 0.10$; $g = 0.67$, $SE = 0.20$). As effects varied between studies, further analyses focused only on controlled trials: MCT had large effect sizes compared to control groups, both immediate and at follow-up, on quality of life ($g = 1.02$, $SE = 0.06$; $g = 1.06$, $SE = 0.12$) and psychological stress ($g = 0.94$, $SE = 0.07$, $p < 0.01$; $g = 0.84$, $SE = 0.10$). Immediate effects were larger for general quality of life ($g = 1.37$, $SE = 0.12$) than for meaning in life ($g = 1.18$, $SE = 0.08$), hope and optimism ($g = 0.80$, $SE = 0.13$), self-efficacy ($g = 0.89$, $SE = 0.14$), and social well-being ($g = 0.81$, $SE = 13$). The homogeneity of these results was validated by the lack of significance of moderators and alternative ways of selecting studies. Metaregression analyses showed that increases in meaning in life predicted decreases in psychological stress ($\beta = -0.56$, $p < 0.001$).

Significance of results: MCT strongly improves quality of life and reduces psychological stress. MCT should be made more widely available, particularly to individuals in transitional moments in life or with a chronic or life-threatening physical illness as they explicitly report meaning-centered concerns.

KEYWORDS: Logotherapy, existential analysis, meaning-centered psychotherapy, existential therapy, psychotherapy, counseling, systematic literature review

INTRODUCTION

What are the effects of addressing meaning in life with clients? In past millennia, talking about mean-

ing in life was often restricted to clergy and philosophers, but in modern secular societies this task is more often taken up by psychological therapists, pioneered by Viktor Frankl and others (Vos, 2016a). Although some therapists have used strong metaphysical formulations in the past, meaning in life is nowadays used as a nonreligious term to describe a set of psychological experiences that can be

Address correspondence and reprint requests to: Joël Vos, Metanoia Institute, W5 2QB, London, United Kingdom and New School of Psychotherapy and Counselling, NW6 1DR, London, United Kingdom. E-mail: Joel.Vos@metanoia.ac.uk.

empirically distinguished from such phenomena as happiness, meaninglessness, and ordinary daily life (Steger, 2012; Vos, 2017a). For instance, a large number of cognitive laboratory experiments, psychometric studies, and surveys have established that most people search for meaning, experience its presence, or use meaning-related coping styles (e.g., Batthyany & Russo-Netzer, 2014; Hicks & Routledge, 2013; Greenberg et al., 2013; Wong, 2013; Reker, 2000). Meaning has been empirically defined as an individual's subjective sense of purpose, values, understanding of self and the world, self-worth, action-directed goals, self-regulation, and coping with existential challenges (Wong, 2012; George & Park, 2014; MacKenzie & Baumeister, 2014; Vos, 2016b). Individuals in more than 150 studies worldwide reported five types of meaning: material, social, self-oriented, higher types, and existential-philosophical types (Vos, 2016a).

Across a range of research, meaning has been shown to be important for clients. For instance, individuals with moderate to severe psychopathology described "living a meaningful and satisfying life" as the core of their psychological recovery in 75 studies (Andresen et al., 2003; 2011; Slade et al., 2012). Perceiving life as meaningful is strongly correlated with a higher quality of life, lower levels of psychological stress (e.g., depression and anxiety), and better physical well-being (Ryff et al., 2004; 2006; Steger, 2012; Brandstätter et al., 2012; Roepke et al., 2014). Furthermore, perceived meaning functions as a source of resilience and meaning-centered coping styles reduce stress after traumatic life events (Folkman, 2008; Park & Folkman, 1997; Park, 2010; Vos, 2016a). However, mental healthcare has traditionally overlooked meaning-centered concerns, such as experiencing a lack of meaning or purpose in life, or being unable to adjust life goals after such life-changing experiences as the loss of a loved one or a chronic disease (Vos, 2016a). In response, it has been argued that mental healthcare should be transformed from curing psychiatric symptoms to supporting clients to live a meaningful life (Seligman et al., 2005).

Many authors suggest that meaning-centered concerns and their treatment are specifically relevant at transitional moments in life: adolescence, midlife, retirement (Battista & Almond, 1973), bereavement (Neimeyer et al., 2011), or trauma (Schulenberg et al., 2014). Researchers have particularly focused on individuals with a chronic or life-threatening disease, a majority of whom wonder how to live a meaningful life despite their illness (e.g., Henoach & Danielson, 2009; Vehling et al., 2012; Vos et al., 2013). However, only a fifth report clinical depression or anxiety (e.g., Mitchell et al., 2011), which explains the modest effect sizes of psychological treatments

that focus on reducing psychopathology and not on meaning-centered concerns (Faller et al., 2013; Hart et al., 2012; van Straaten et al., 2010). Furthermore, cross-sectional studies demonstrate that patients cope better with their disease when they "create meaning out of chaos" (Bullington et al., 2005; King et al., 2006) and use meaning-centered coping styles (Park, 2010; Folkman, 2008).

To address the clients' meaning-centered needs, more than 28 different meaning-centered therapeutic approaches have evolved (see an overview in Vos [2017]). Some 21 include meaning among other therapeutic aims, such as acceptance and commitment therapy (Hayes et al., 2012) and positive psychology (Seligman & Csikszentmihalyi, 2000), and 7 for whom meaning is the predominant focus. This last group will be referred to as meaning-centered therapy (MCT), defined as a therapeutic approach addressing meaning in life as its main aim, with a systematic approach. Worldwide, 69 MCT institutes exist, associated with tens of thousands of therapists (Correia, 2015). Preliminary metaanalyses of a small sample of six MCT trials showed large effect sizes on psychological well-being and quality of life, but this included only English publications with an existential-therapeutic focus (Vos et al., 2015). Thus, despite its popularity and positive preliminary findings, the precise effectiveness of MCT remains unclear. However, practitioners need to understand the potential beneficial effects of addressing meaning, with respect to self-selection biases and such nonspecific effects as time, attention, treatment expectations, and the difference in effectiveness between other therapeutic treatments (Chambless & Hollon, 1998).

We have therefore systematically reviewed effectiveness studies on different types of MCT in multiple languages. As psychological treatments are usually complex and consist of multiple therapeutic techniques, eligible studies were semistructured and standardized via treatment manuals (Carroll & Nuro, 2002). As placebo conditions and complete blinding are impossible in talking therapies, no type of control conditions were considered (Chambless & Hollon, 1998). It has been recommended to focus reviews only on bona fide psychological treatments that address specific therapeutic aims via specific therapeutic methods (Wampold et al., 2002). Therefore, this review only included MCT manuals primarily and were solely aimed at improving quality of life, such as meaning in life (primary outcome) and reducing such psychological stress as depression and anxiety (secondary outcome), via explicitly addressing meaning in life with a systematic method (mediator). Meaning-centered therapists hypothesize that MCT improves the client's meaning-making skills, which subsequently reduces their psychological

stress (comprehensive reviews of the logical and conceptual model of MCT can be found elsewhere: Vos, 2016a; 2016b). This was tested via metaanalyses, examining the effects of MCT on quality of life and psychological stress, and testing the hypothesis that improvements in perceived meaning reduce psychological stress.

METHOD

Study Selection Rounds

The systematic literature review was conducted in nine consecutive rounds, as Figure 1 shows, in line with the PRISMA and MOOSE guidelines (Liberati et al., 2009; Stroup et al., 2000). First, multiple databases were employed: PubMed, the Web of Knowledge, PsycINFO, Medline, Embase, scholar.google.com, and Scopus. Search terms and key authors were based on an exploratory review (Vos et al., 2015). These combined intervention terms included (therap*/counsel*/coach*/intervention/analys*/treat*/care/support/psychol*/psychiat*/outcome*/result*/ effect*/change/eval*/assess*/trial*) and the meaning-centered nature (meaning-in-life/meaning-of-life/search-for-meaning/noogenic/noetic/logo-ther*/logo-anal*/purpose-in-life/life-purpose/goals-in-life/life-goals/meaning-cent*/meaning-mak*/meaning-orient*/existential-analys*/logo-anal*), or key authors (Breitbart/Fabry/Fillion/Frankl/Henry/Langle/Lee/Lukas/Marshall/Neimeyer/Starck/Wong/Zuehlke). Given the large number of findings, we added PubMed Mesh terms ([counselling] OR [psychotherapy] OR [psychology]) and capped scholar.google.com results at 10,000 hits.

Second, we hand-searched the journals *Existential Analysis* and *International Forum for Logotherapy* and the websites of MCT institutes (Correia, 2015). Third, 10 experts searched and translated references in Arabic, Chinese, Dutch, Farsi, French, German, Indonesian, Italian, Korean, Portuguese, Russian, and Spanish. Fourth, all included authors were contacted to identify other studies. All 10 experts were fluent in their mother tongue and English, were professionally educated in MCT and/or existential therapy, at least at the master's level, had more than two years of therapeutic experience, and were trained to search and translate references. Fifth, additional studies were identified via reference lists. Sixth, all titles and abstracts were initially screened for eligibility. Seventh, studies were excluded through a thorough reading of abstracts. Eighth, studies were excluded on the basis of full-text manuscripts. Ninth, studies were excluded from their analyses, when they did not have enough data or did not measure quality of life or psychological stress.

Eligible studies had the following characteristics: (1) aiming to treat specific individual psychological problems (self-discovery, religious, and philosophical practices excluded); (2) primarily aiming to support clients to live a meaningful life without other primary therapy aims that could conflate study effects (e.g., acceptance and commitment therapy [ACT] was excluded, as its founders explicitly state that it has a range of aims and methods and does not merely focus on meaning (see Vos [2016a] for a description of differences between ACT and MCT)); (3) having a systematic approach (e.g., stepwise exploration of different meaning-centered topics); (4) being designed as a full therapeutic approach, consisting of multiple therapeutic techniques, and not only one specific technique, such as autobiographic writing or paradoxical intention (e.g., Chochinov et al., 2005; Bohlmeijer et al., 2003); (5) using valid and reliable psychometric outcome instruments; (6) meeting Wampold et al.'s (2002) criteria for bona fide interventions; (7) having a retrievable and intelligible full-text manuscript; and (8) not having unrealistically large effect sizes (Hedges' $g > 3$) or a high risk of bias, such as nonselective reporting according to Cochrane's risk-of-bias criteria (Higgins & Green, 2008) to prevent biased results (Rosenthal, 1991; 1995).

Given the large number of references, author J.V. conducted all rounds. His selection was consistent with author D.V., who independently searched and screened a random sample of 500 references and conducted rounds 3–5 (interrater $\kappa = 0.92$ and 0.82). Interrater reliability of independent bias assessment and coding of study characteristics were high ($\kappa = 0.87, 0.85$). Both raters have a clinically and scientifically relevant background in MCT, existential therapy, and empirical research.

Metaanalytic Steps

All studies had sufficient clinical homogeneity, as identified by the 10 experts. Of course, clinical homogeneity does not necessarily imply statistical homogeneity findings. Instead of cherry-picking and only presenting the most statistically homogenous and effective findings, or only the largest samples—as seems common practice in metaanalyses—it was decided to be transparent. This article will describe how studies were excluded and included and present findings at each metaanalytic step. Presenting all findings seems particularly relevant for new therapies with relatively few studies. The authors believe that transparency about the metaanalytic steps may yield relevant information about validity and generalizability, and guide the future direction of

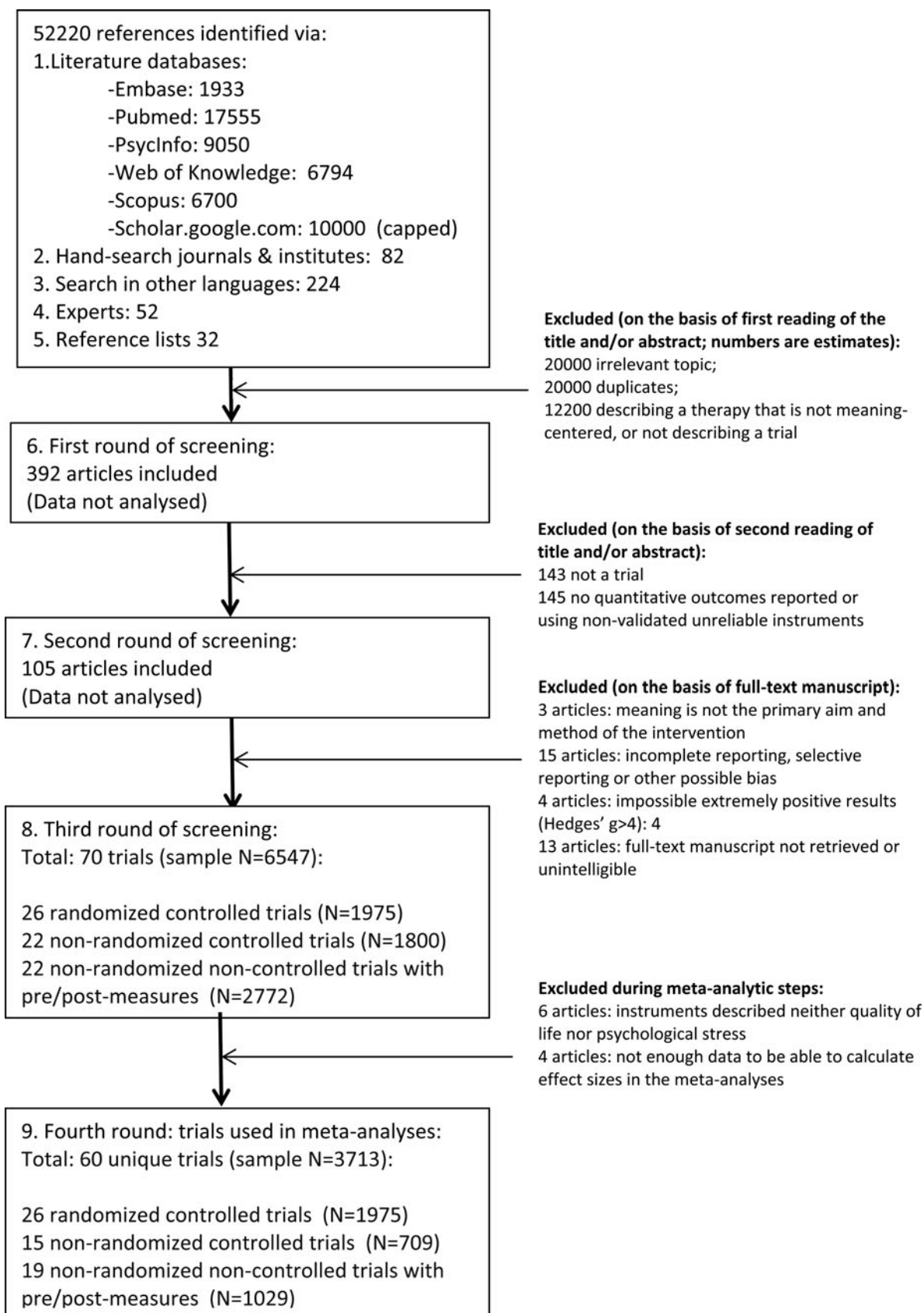


Fig. 1. Flowchart of included and excluded studies.

the therapeutic field, especially in the case of heterogeneity.

The studies were coded and metaanalyses conducted and presented in nine consecutive steps (see Table 1). In the first step, overall effects for all trials were calculated. Second, metaanalysis tested the hypothesis that there was a significant difference between effects measured immediately after the last therapy session and effects at follow-up between 4 and 12 months later. As differences were found, all next metaanalytic steps were separately conducted for immediate and follow-up measurements. Third, metaanalysis tested the hypothesis that different outcome instruments have different effects. To test this hypothesis, each outcome instrument in each study was coded in either the overall categories “quality of life” and “psychological stress,” following previous studies (Vos et al., 2013). If multiple instruments were used in one study to measure one category, average effect sizes were calculated. Whether an instrument belonged to a category was decided on the basis of content and nonsignificant small heterogeneity ($p(Q) > 0.05$ and $I^2 < 50\%$). As large heterogeneity was found, more specific subcategories were created on the basis of their content and low heterogeneity (see Table 2).

Fourth, metaanalysis tested the hypothesis that different study designs would cause different effect sizes. Studies were coded for being randomized and controlled, and for type of control condition (Table 1). A difference was found on the basis of large heterogeneity between studies and small heterogeneity within studies, and significant moderate/large contrasts (Cohen's $d > 0.30$, $p < 0.05$). The effect sizes were found to be inflated in noncontrolled trials. It was thus decided to focus on controlled trials only, to focus on estimating true effect sizes and not on artificially inflated effects. The next metaanalytic steps included both randomized and nonrandomized trials and all types of control conditions, as these did not differ in effects. When randomized and nonrandomized controlled and noncontrolled trials were compared, the effect sizes described changes in scores from baseline to posttreatment/follow-up measurement (“change effect”). This answered the question “How much change do individuals experience between the measurements before and after MCT?” When randomized and nonrandomized controlled trials were compared, the effect sizes described the effects of MCT compared with control groups (“relative effects”). This answered the question “What is the difference between the improvements in clients receiving MCT compared with clients in control conditions?”

Fifth, the hypothesis was tested that sample characteristics influence effect sizes, such as participants' inclusion criteria, age, and gender (Table 1), via con-

trasts, moderator, and metaregression analyses. The variables included were based on conceptual reviews and preliminary metaanalyses of MCT (Vos et al., 2015; Vos, 2016a; 2016b). Sixth, similar analyses were employed to test the hypothesis that the study results were influenced by treatment characteristics, such as type of MCT, group or individual format (Table 1, based on Vos et al., 2015). Seventh, similar analyses were used to test whether studies differed in effect size due to describing different types of therapeutic skills in the treatment manuals, which answered the question of whether therapeutic skills lead to larger effects. The treatment manuals were coded according to the presence of 39 core meaning-centered therapist skills that have been described elsewhere (Vos, 2016a; 2017), such as: providing didactics about meaning in life, stimulating clients to set and experiment with achievable goals in daily life, focusing on self-worth, and doing mindfulness exercises (Table 1).

In step eight, similar analyses tested the hypothesis that effects were influenced by sample size, year of publication, or precision of effects (Dechartres et al., 2014; Capellini et al., 2012). Additional reanalyses of steps 1–6 were conducted, first only in studies with the 25% largest sample sizes, second only in studies published since 2000, and third only in studies with the 25% most precise effects. The effects were regarded similar to the original findings if the significance and magnitude of the effects were similar (significant/nonsignificant; small/moderate/large) and effect sizes did not differ by more than 10%.

In step nine, we tested the unique assumption of this therapeutic approach that MCT improves the client's perceived meaning, which subsequently reduces their psychological stress. The effects of MCT on improving meaning was already tested in previous steps, as part of the effects on quality of life. Metaanalyses tested the hypothesis that the changes in meaning in life predicted the changes in psychological stress. We assumed that the results from this statistical test would suggest mediation, that is, the improvement of perceived meaning explains the effects of MCT on stress (mediation). Thus, we did not only assume a correlation between these change scores but also a causal relationship: the reason for assuming mediation is that all treatment manuals described therapeutic techniques that explicitly and systematically addressed meaning with the aim of reducing stress, while the manuals in control conditions did not.

STATISTICAL PROCEDURES

We entered means, standard deviations, N , p value (or other statistics if not available, e.g., t value or F

Table 1. Description of coding of variables and metaanalytic steps

Step	Hypothesis	Categorizing and coding variables	Metaanalytic step
1	All studies: overall, MCT has large effects.		Inclusion of low-risk-of-bias trials on MCT only (see paragraph on “study selection steps”).
2	Measurement moment: different measurement moments have different effects.	<ul style="list-style-type: none"> ■ Immediate effects: outcomes within 4 months after the last MCT session. ■ Follow-up effects: outcomes between 4 and 12 moments after the last MCT session. 	All next metaanalytic steps are separately conducted for immediate and for follow-up effects.
3	Outcome instruments: different outcome instruments have different effects.	<ul style="list-style-type: none"> 3.1. Quality of life (1), psychological stress (2) or other (3). 3.2. Quality of life instruments: general quality of life (1), meaning in life (2), hope and optimism (3), self-efficacy (4), social relationships (5), and other (6). 3.3. Psychological stress instruments: depression (1), anxiety (2), existential stress (3), and other (4). 3.4. Individual instruments. 	<p>Steps 3.1–3.4 are conducted separately for immediate and follow-up effects.</p> <p>3.1. Each outcome instrument in each study is placed within one category. If multiple instruments are used in one study to measure one category, average effect sizes are calculated for that study. Whether an instrument belongs to a category is decided on the basis of content, $p(Q) > 0.05$ and $I^2 < 50\%$. As large heterogeneity between and within studies could be due to how instruments are categorized, steps 3.2, 3.3, and 3.4 will follow if instruments appear to be statistically heterogeneous, to find less heterogeneous categories. The next steps will only be conducted in nonheterogeneous categories ($p(Q) > 0.05$ and $I^2 < 50\%$). See procedures in Vos et al. (2015).</p>
4	Study design: different study designs have different effects.	<ul style="list-style-type: none"> 4.1. Randomized controlled trials (1), nonrandomized controlled trials (2), nonrandomized noncontrolled trials (3). 4.2. Type of control condition: active treatment (1), care as usual (2), waiting list, or no treatment (3). 4.3. Type of alternative intervention or care as usual: support group (1), cognitive behavioral intervention (2), psychoeducation/biblio-therapy (3), relaxation (4), combination of best-practice treatments (5), other (6). 	<p>Steps 4.1–4.3 are conducted separately for immediate and follow-up effects, only in the most nonheterogeneous instrument categories.</p> <p>4.1. Moderation analyses and contrasts with dummy variables are calculated to analyze whether studies with different designs differ in effect sizes, as indicated by large heterogeneity between studies and small heterogeneity within studies, and significant moderate/large contrasts (Cohen’s $d > 0.30$, $p < 0.05$). If shown significant, all next steps will be conducted only in the category with the least inflated effect sizes, to focus on the most robust studies.</p> <p>4.2. Similar moderation analyses and contrasts are calculated for studies with different types of control conditions, and if significant moderate/large differences exist, only studies with the least inflated control conditions will be presented.</p>

Continued

Table 1. *Continued*

Step	Hypothesis	Categorizing and coding variables	Metaanalytic step
5	Sample characteristics: different samples have different effects.	5.1. Physical disease as inclusion criterion (1) or not (0). 5.2. High level of psychological stress as inclusion criterion (1) or not (0). 5.3. Type of sample: cancer (1), noncancer physical disease (2), psychological disease (3), transitional moments in life(4), caregivers (5), other (6). 5.4. Education level: low (1), mean (2), high (3). 5.5. Age (years). 5.6. Proportion of male participants (%). 5.7. Continent of treatment: Europe (1), USA (2), Asia (3), Australia (4), Africa (5) 5.8. Individual country of treatment. 5.9. Different types of ethnicity of participants (each ethnicity is reported by its percentage of the total sample size).	Steps 5.1–5.9 are conducted separately for immediate and follow-up effects, only in the most nonheterogeneous instrument categories in studies with the least conflating study designs. 5.1–5.3. Moderation analyses and contrasts are calculated to analyze whether studies with different sample characteristics differ in effect size. 5.4–5.9. Metaregression analyses are conducted to examine whether age, gender, country and ethnicity influence effect size.
6	Treatment characteristics: different types of meaning-centered treatment have different effects.	6.1. MCT types: Frankl’s logotherapy (1), General MCT based on Frankl’s principles (2), meaning-centered psychotherapy (3), meaning-making intervention (4), existential analysis (5), meaning therapy (6). 6.2. Format: group (1), individual (2), couples (3). 6.3. Number of sessions. 6.4. Level of structure of therapy: low (1)– high (5). 6.5. Level of manualization: low (1) to high (5). 6.6. Level of using religious/spiritual terminology and theory in the treatment manual: low (1) to high (5).	Steps 5.1–5.9 are conducted separately for immediate and follow-up effects, only in the most nonheterogeneous instrument categories in studies with the least conflating study designs. 6.1.–6.6. Moderation analyses and contrasts are calculated to analyze whether studies with different treatment characteristics differ in effect sizes.
7	Therapist skills: Different therapist skills (as described in the treatment manuals) have different effects.	7.1. 39 MCT skills each scored as relatively important (1) or relatively unimportant (0) in the treatment manual. 7.2. 39 MCT therapist skills each scored as low (1) to high (5) attention for this skill (See Vos, 2016a for an overview of skills).	Step 7 is conducted separately for immediate and follow-up effects, only in the most nonheterogeneous instrument categories in studies with the least conflating study designs. 7.1. Moderation analyses and contrasts are calculated to analyze whether studies focusing on different therapy skills differ in effect size. 7.2. Metaregression analyses tests whether MCT skills predict overall study effects. Subsequently, all significant therapist skills ($p < 0.05$) are inserted as predictors in multiple regression analyses.

8	Study characteristics: different study characteristics have different effects.	7.1. Sample size. 7.2. Year of publication. 7.3. Precision of effect (standard error of the effect).	In each of steps 3–6, the possible influence of sample size, year of publication, and precision of effects is tested via metaregression. Subsequently, all analyses in steps 1–6 are redone, first only in studies with the 25% largest sample sizes, second only in studies published since 2000, and third only in studies with the 25% most precise effects. Metaregression analysis was performed in the studies identified in steps 1–4, with “effect on the meaning in life” predictor and “effect on psychological stress as predicted variable.”
9	Changed meaning as predictor: changes in meaning in life after MCT predicts changes in psychological stress.	A variable for the average effect on meaning in life was created.	

value), according to *Introduction to Meta-Analysis* (Borenstein et al., 2009). When correlations among pre-, post-, and follow-up assessments were not reported, formulas were used (Morris & DeShon, 2002; Dunlap et al., 1996) or the average correlation of 0.70 was inserted. In case of multiple control groups, psychological treatments with the largest effect size were selected.

Effects were calculated with Hedges' g and its 95% confidence interval (95% CI). This is a variation on Cohen's d , corrected for biases due to small sample sizes and regarded a robust technique in the social sciences (Hedges, 1985). This may be conservatively interpreted with Cohen's (1988) convention of small (0.2), medium (0.5), and large (0.8) effect sizes. Random effects were calculated, as studies differed in terms of population and MCT type, and random effects adequately mirrored heterogeneity in behavioral studies with non-inflated alpha (α) levels (Hunter & Schmidt, 2000). Spurious outliers were identified in each metaanalytic step and discarded by using a trimming technique that excluded studies where the 95% CI was lower than the aggregated confidence interval of all studies (Borenstein et al., 2009). Publication bias was tested in each metaanalytic step by visual inspection of funnel plots and calculation of Egger intercepts, using a trim-and-fill procedure, which provides an estimate of effect size after publication bias has been taken into account (Duval & Tweedie, 2000) (n.b.: publication bias will only be reported in this article in case of significant bias). A-priori power analyses estimated that five or more studies are required to detect moderately large effect sizes, similar as what was done in previous studies (Vos et al., 2013), with a power over 0.80 (Valentine et al., 2010; Borenstein et al., 2009). If fewer than five studies reported on an outcome, this outcome was not presented.

RESULTS

Description of Included Trials

We found 52,220 citations (see Table 1), most of which were excluded due to irrelevance, duplication, or non-quantitative/non-trial designs. Some 32 trials were excluded for high risk of bias, 6 for irrelevant outcome measures, and 4 for lacking useful data. A total of 60 trials were included in the final review, covering 3,713 participants. This comprised 26 randomized controlled trials ($N = 1,975$), 15 non-random controlled trials ($N = 709$) and 19 non-randomized noncontrolled trials with pre/post measures only ($N = 1,029$).

Studies were conducted in the Middle East ($k = 18$), North America ($k = 16$), South-East Asia ($k =$

Table 2. Overview of included instruments and subcategories

Source	Instruments measuring quality of life	Instruments measuring psychological stress
Randomized controlled trials		
Breitbart et al., 2010	MiL: FACIT Hope: BHS; LOT	Anxiety: HADS Depression: HADS Other: SAHD
Breitbart et al., 2012	QoL: MQoL MiL: SWB; FACIT Hope: BHS	Anxiety: HADS Depression: HADS Other: MSAS
Breitbart et al., 2015	QoL: MQoL MiL: FACIT	Depression: BDI; HADS Anxiety: HADS Other: SAHD
Cheng et al., 2015	MiL: MLQ; CSMLS SE: RSES	Other: GHQ-20
Koç et al., 2013	N/A	Anxiety: Social Anxiety Scale
Crumbaugh & Carr, 1979	SE: PIL	N/A
Fillion et al., 2009	MiL: FACIT	Other: POMS
Farhadi et al., 2014	QoL: WHOQoL Soc: WHOQoL-social	Other: WHOQoL-mental health
Hamidi & Manshaee, 2013	SOC: ENRICH marital satisfaction	N/A
Henry et al., 2010	QoL: MQoL MiL: FACIT SE: GSES Soc: MQoL-social	Anxiety: HADS; Depression: HADS Other: MQoL psychological
Herawati & Sudiyanto, 2010		Depression: BDI
Hosseinzadeh-Khezri et al., 2014	N/A	Other: GHQ-28
Jafary & Afzali, 2013	QoL: SF-36	N/A
Lai et al., 2012	QoL: QoLC-E total, quality of life item MiL: QoLC-E value; Soc: QoLC-E support, alienation	Other: QoLC-E negative emotion, Existential distress
Lee et al., 2006a	Hope: LOT SE: RSES; GSES	N/A
MacKinnon et al., 2015a	MiL: PIL	Depression: CES-D Anxiety: STAI Other: HGRC; CBI; RGEI
Mohammadi et al., 2014	Hope: AHS	Depression: BDI
Lai et al., 2012	QoL: QoLC-E-total MiL: QoLC-E-value Soc: QoLC-E-alienation, support	Other: QoLC-E-negative emotions, existential distress
Moosavi et al., 2012	N/A	Depression: Geriatric Depression Scale-15
Mosalanejad & Koolee, 2013	N/A	PSS Anxiety: PSWQ
Ramin et al., 2014	QoL: WHOQoL Soc: WHOQoL-social	Other: WHOQoL-mental health
Shin, 2007	QoL: MiL: MLQ SE: GSES-Soc	Depression: DASS; PSS
Shoaakazemi et al., 2012	QoL: WHOQoL Soc: WHOQoL-social	Other: WHOQoL-mental health
Starck, 1979	PIL; SONG	N/A
van der Spek et al., 2014	QoL: EORTC-QLQ-C30-global MiL: SPWB; PMP; Hope: MAC; LOT; BHS; SE: SPWB; Soc: SPWB; PMP; PTGI; EORTC-QLQ-C30	Other: EORTC-QLQ-C30 Anxiety: HADS; MAC-anxiety
Zuehlke & Watkins, 1977	MiL: PIL	Depression: DAS Other: BPRS
Nonrandomized controlled trials		
Aghajani, 2015	QoL: WHOQoL	Other: WHOQoL-mental health

Continued

Table 2. *Continued*

Source	Instruments measuring quality of life	Instruments measuring psychological stress
Cho, 2008	MiL: PIL	Other: SCL-90-R
Cho et al., 2013	MiL: PIL	Depression: CES-D
Hosseini et al., 2013	QoL: WHOQoL	Other: WHOQoL-mental health
Idris et al., 2015	N/A	Depression: DASS
Kang et al., 2009a	QoL: QoL MiL: AMIL	N/A
Kang et al., 2009b	MiL: AMIL; SWS	N/A
Kang et al., 2013	MiL: AMIL; Respect for Life Scale	Depression: CDI
Lee, 2006	MiL: Meaning in Life in the elderly; SE: Ego Integrity	N/A
Moazinezhad et al., 2015	SE: SPWB Soc: SPWB MiL: SPWB	Other: Stress Scale
Mohabbat-Bahar et al., 2014	N/A	Anxiety: BAI
Kim et al., 2013	MiL: AMIL	N/A
Tobing et al., 2014	MiL: MLQ	Anxiety: HADS Depression: HADS
Wijayanti, 2010	N/A	Anxiety: HAS
Wimberly, 2006	MiL: PIL	N/A
Nonrandomized noncontrolled trials (pre/post measurement only)		
Delavari & Nasirian, 2014	N/A	Depression: BDI Anxiety: BAI
Beltrán, 2011	N/A	Other: Davidson Trauma Scale
Cheraghi & Tajar, 2015	N/A	Other: GHQ-28
Gil & Breitbart, 2013	MiL: FACIT; PTGI Hope: LOT SE: PTGI Soc: PTGI	Anxiety: HADS Depression: HADS
Lantz & Raiz, 2004	MiL: PIL	N/A
Langle et al., 2005	MiL: ESK; EWL Soc: KASSL	Other: TPF; KASSL
Langle et al., 2014	MiL: ESK; EWL Soc: KASSL	Other: KASSL
Lee et al., 2006b	MiL: PIL Hope: LOT SE: RSES	Anxiety: HADS; IES Depression: HADS
Makola, 2014a	MiL: PIL	Depression: BDI
Makola, 2014b	MiL: PIL MiL: Life Purpose Questionnaire; QoL: Professional Quality of Life Scale	N/A Other: Nursing Stress Scale
Lau et al., 2012	QoL: QoLC-E	N/A
MacKinnon et al., 2015b	MiL: PIL	Anxiety: STAI Depression: CES-D Other: Integration of Stressful Life Experiences Scales (ISLES) Revised Grief Experience Inventory; Core Bereavement Items; Hogan Grief Reaction Checklist
Rios, 2012	MiL: Logotest	N/A
Thompson, 2015	MiL: PIL; MLQ	Other: Behavioral and Symptom Identification Scale-32
Torres & Noblejas de la Flor, 2007	MiL: PIL; SONG	N/A
Ukus et al., 2015	MiL: MLQ	N/A
Van der Spek et al., 2014	MiL: PMP, PTGI, SPWB Hope: LOT SE: PMP, SWBS; SPWB Soc: PMP, PTGI	Anxiety: HADS; MAC Depression: HADS Other: MAC

Continued

Table 2. *Continued*

Source	Instruments measuring quality of life	Instruments measuring psychological stress
Vos & Hutchinson, 2016	N/A	Anxiety: General Anxiety Disorder (GAD-7) Other: Patient Health Questionnaire (PHQ-9)

N/A = not applicable; ND = no data available.

Groups of outcome instruments: QoL = general instruments or subscales measuring quality of life; MiL = meaning in life; hope = hope, hopelessness and optimism; SE = self-efficacy; Soc = social relationships.

Specific categories of outcome instruments: AHS = Adult Hope Scale; AMIL = Adolescent Meaning in Life; BDI = Beck Depression Inventory; CDI = Children Depression Inventory; BHS = Beck Hopelessness Scale; BPRS = Brief Psychiatric Rating Scale; CBI = Core Bereavement Inventory; CES-D = Center for Epidemiological Studies Depression Scale; CSMLS = Chinese Sources of Meaning in Life Scales; DAS = Death Anxiety Scale; DASS = Depression and Anxiety Symptoms Scale; EWL = Eigenschaftsworterliste; ESK = Eksistenzskala; FACIT = Functional Assessment of Chronic Illness Therapy; GSES = Generalized Self-Efficacy Scale; HADS = Hospital Anxiety and Depression Scale; HAI = Hopelessness Assessment in Illness Questionnaire; HAS = Hamilton Anxiety Scale; HGRC = Hogan Grief Reaction Checklist; KASSL = Kieler Anderungssensitive Symptomliste; LOT = Life Orientation Test-Revisited; MAC = Mental Adjustment to Cancer Scale; MLQ = Meaning in Life Questionnaire; MQoL = McGill Quality of Life Questionnaire; MSAS = Memorial Symptom Assessment Scale; OHQ = Oxford Happiness Questionnaire; PSS = Perceived Stress Scale; PIL = Purpose in Life Scale; PMP = Personal Meaning Profile; PSWQ = Penn State Worry Questionnaire; POMS = Shortened Profile of Mood States; QoL = Quality Of Life scales; QoLC-E = Quality of Life Concerns at the End of Life; RGEI = Revised Greif Experience Inventory; RSES = Rosenberg Self-Esteem Scale; PTGI = Posttraumatic Growth Inventory; SAHD = Schedule of Attitudes Towards Hastened Death; SONG = Seeking of Noetic Goals; SPWB = Ryff's Scale of Psychological Well-Being; STAI = State-Trait Anxiety Inventory (only state used); SWB = Spiritual Well-Being Scale; TPF = Trier Persönlichkeitsfragebogen; WHOQoL = World Health Organization Quality of Life Short Scale.

14), Europe ($k = 6$), South Africa ($k = 3$), and South America ($k = 2$). Samples included physical illness ($k = 26$), psychiatric diagnoses ($k = 8$), transitional moments in life ($k = 12$), caregivers ($k = 7$), substance misuse ($k = 4$), marital issues ($k = 2$), and prisoners ($k = 1$). The mean age was 42.4 ($SD = 16.2$) years, ranging from 15 to 79. Some 31% were male ($M = 31.7\%$, $SD = 20.2\%$), 32.6% ($SD = 19.7\%$) held their highest degree in higher education, 52.5% ($SD = 17.6\%$) in secondary school/college, and 14.9% ($SD = 4.9\%$) in primary school or had no education.

The control conditions included care as usual ($k = 23$), alternative treatment ($k = 15$), and waiting list ($k = 3$). As most care as usual included an alternative treatment ($k = 16$), these groups were reformulated as treatment. Alternative treatments ($k = 23 + 15 = 38$) included support groups ($k = 19$), cognitive behavioral therapy ($k = 4$), psychoeducation/bibliotherapy ($k = 3$), relaxation/mindfulness ($k = 3$), or a best-practice integration of treatments ($k = 9$). The mean number of MCT sessions was 8.65 ($SD = 3.3$). Some 32 trials included individual treatments, 26 groups, and 2 coupled treatments. Treatments included logotherapy ($k = 15$), general MCT ($k = 29$), meaning-centered psychotherapy ($k = 9$), meaning-making interventions ($k = 3$), existential analysis ($k = 2$), and meaning therapy ($k = 1$). **Tables 3** and

4 describe these treatments, their differences and their overlaps.

Metaanalytic Results

Step 1. Overall effect sizes were large ($g = 1.62$, $SE = 0.32$). This result was discarded due to its very large heterogeneity ($I^2 = 95\%$).

Step 2. Significant differences were found between immediate and follow-up effects ($d > 0.46$, $p < 0.001$). Therefore, all the next meta-analytic steps were conducted separately for immediate and follow-up effects.

Step 3. Large heterogeneity was found, both immediate and at follow-up (respectively, $I^2 = 92$, 94%). Therefore, the outcome instruments were recategorized. Some 49 studies included quality-of-life instruments and 49 psychological stress instruments (i.e., 21 studies measured both meaning and stress and 39 described either meaning or stress; see **Table 5**). Metaanalyses showed large improvements from baseline measurement to immediate posttreatment and follow-up on quality of life (Hedges' $g = 1.13$, $SE = 0.12$; $g = 0.99$, $SE = 0.20$) and psychological stress ($g = 1.21$, $SE = 0.10$; $g = 0.67$,

Table 3. Characteristics of the trials included in the metaanalyses

Source	Type of MCT	Target population	Group or individual therapy	Control condition as formulated by authors	Subcategories of quality of life instruments	Subcategories of psychological stress instruments	Country	N
Randomized controlled trials								
Breitbart et al., 2010	Meaning-centered group psychotherapy	Advanced cancer	Group	AI (Alternative Intervention): Support Group	Meaning in life Hope	Anxiety Depression	USA	90
Breitbart et al., 2012	Meaning-centered psychotherapy	Advanced cancer	Individual	AI: Therapeutic massage	Quality of life Meaning in life Hope	Anxiety Depression	USA	78
Breitbart et al., 2015	Meaning-centered group psychotherapy	Advanced cancer	Group	AI: Support Group	Quality of life Meaning in life	Anxiety Depression Other	USA	253
Cheng et al., 2015	General MCT	College students	Group	CAU (Care As Usual)	Meaning in life Self-efficacy	Other	China	66
Koç et al., 2013	Logotherapy	Social anxiety	Group	AI: support group	N/A	Anxiety	Turkey	16
Crumbaugh & Carr, 1979	Logotherapy	Alcohol abuse	Group	AI: Jellinek-type multidisciplinary support & education	Self-efficacy	N/A	USA	150
Fillion et al., 2009	Meaning-centered group intervention	Palliative care nurses	Group	WL (Waiting List)	Meaning in life	Other	Canada	109
Farhadi et al., 2014	General MCT	Cancer	Group	AI: support group	Quality of life Social relationships	Other	Iran	42
Hamidi & Manshaee, 2013	Logotherapy	Marital relationship	Couples	AI: supportive couple therapy	Social relationships	N/A	Iran	78
Henry et al., 2010	Meaning- making intervention	Advanced ovarian cancer	Individual	CAU	Quality of life Meaning in life Self-efficacy Social relationships	Anxiety Depression Other	Canada	24
Herawati & Sudyanto, 2010	Logotherapy	Chronic pain	Individual	CAU		Depression	Iran	18
Hosseinzadeh-Khezri et al., 2014	General MCT	Colorectal cancer, receiving chemotherapy	Group	CAU	N/A	Other	Iran	35
Jafary & Afzali, 2013	General MCT	Menopausal women	Group	AI: Self-efficacy intervention; Body Image Intervention	Quality of life	N/A	Iran	54

Continued

Table 3. Continued

Source	Type of MCT	Target population	Group or individual therapy	Control condition as formulated by authors	Subcategories of quality of life instruments	Subcategories of psychological stress instruments	Country	N
Lai et al., 2012	General MCT	Advanced cancer	Individual	CAU	Quality of life Meaning in life Social relationships	Other	China	84
Lee et al., 2006a,b	Meaning-making intervention	Colorectal cancer	Group	CAU	Hope Self-efficacy	N/A	Canada	74
MacKinnon et al., 2015a,b	Meaning-centered bereavement group	Uncomplicated grief	Group	AI: support group	Meaning in life	Anxiety Depression Other	Canada	20
Mohammadi et al., 2014	Logotherapy	Women with depression	Individual	CAU	Hope	Depression	Iran	36
Lai et al., 2012	General MCT	Advanced cancer	Individual	AI: Active Care as usual	Quality of life Meaning in life Social relationships	Other	China	84
Moosavi et al., 2012	Logotherapy	Elderly men	Individual	AI: Cognitive Therapy	N/A	Depression	Iran	45
Mosalanejad & Koolee, 2013	Logotherapy	Infertile women	Group	AI: psycho-education	N/A	Anxiety	Iran	65
Ramin et al., 2014	Logotherapy	Mothers of hearing-impaired children	Group	CAU	Quality of life Social relationships	Other	Iran	30
Shin, 2007	General MCT	Year 1 university students	Individual web-based	CAU	Quality of life Meaning in life Self-efficacy	Depression	USA	285
Shoaakazemi et al., 2012	Logotherapy	Posttraumatic stress disorder	Group	CAU	Quality of life Social relationships	Other	Iran	24
Starck, 1979	Logotherapy	Spinal cord injury	Individual	CAU	Meaning in life	N/A	USA	25
van der Spek et al., 2014	Meaning-centered group psychotherapy	Cancer, treatment with curative intent	Group	AI: support group; CAU: care as usual	Quality of life Meaning in life Hope Self-efficacy Social relationships	Anxiety Depression Other	Netherlands	170
Zuehlke & Watkins, 1977	Logotherapy	Terminal cancer, male veterans	group	WL	Meaning in life	Depression Other	USA	20
Non-randomized controlled trials (quasi-experimental trials)								
Aghajani, 2015	Logotherapy	Women heads of households	group	WL	Quality of life	Other	Iran	30

Cho, 2008	Logo-autobiography	Wives of alcoholics	Individual	CAU	Meaning in life	Other	Korea	40
Cho et al., 2013	Logo-autobiography	Depressed immigrant women	Individual	CAU	Meaning in life	Depression: CES-D	Korea	40
Hosseini et al., 2013	General MCT	Students	Group	CAU	Quality of life	Other	Iran	20
Idris et al., 2015	General MCT	Elderly	Individual	AI: occupational therapy	N/A	Depression	Indonesia	30
Kang et al., 2009a	General MCT	Late adolescents with cancer	Group	CAU	Quality of life Meaning in life	N/A	Korea	44
Kang et al., 2009b	General MCT	Adolescents with cancer	Group	CAU	Meaning in life	N/A	Korea	29
Kang et al., 2013	General MCT	Older school-age children	Group	CAU	Meaning in life	Depression	Korea	142
Lee et al., 2006a,b	General MCT	Elderly	Individual	CAU	Meaning in life Self-efficacy	N/A	Korea	51
Moazinezhad et al., 2015	General MCT	Multiple Sclerosis	Group	CAU	Self-efficacy Social relationships Meaning in life	Other	Iran	24
Mohabbat-Bahar et al., 2014	General MCT	Breast cancer	Group	CAU	N/A	Anxiety	Iran	30
Kim et al., 2013	General MCT	Early adolescents with cancer	Group	CAU	Meaning in life	N/A	Iran	22
Tobing et al., 2014	General MCT	Cancer	Individual	AI: Relaxation	Meaning in life	Anxiety Depression	Indonesia	90
Wijayanti, 2010	General MCT	Female prisoners	Group	CAU	N/A	Anxiety	Indonesia	58
Wimberly, 2006	General MCT	African American elementary students	Group	CAU	Meaning in life	N/A	USA	59
Noncontrolled nonrandomized trials (pre/post effects only)								
Delavari & Nasirian, 2014	General MCT	Mothers of children with cancer	Individual	N/A	N/A	Anxiety Depression	Iran	30
Beltrán, 2011	General MCT	Victims of sexual abuse	Individual	N/A	N/A	Other	Ecuador	6
Charghi & Tajar, 2015	General MCT	Women with a psychiatric diagnosis	Individual	N/A	N/A	Other	Iran	ND
Gil & Breitbart, 2013	Meaning-centered group psychotherapy	Cancer, Palliative Care	Group	N/A	Meaning in life Hope Self-efficacy Social relationships	Anxiety Depression	Spain	6
Lantz & Raiz, 2004	Marital meaning therapy	Older couples	Couple	N/A	Meaning in life	N/A	USA	29

Continued

Table 3. Continued

Source	Type of MCT	Target population	Group or individual therapy	Control condition as formulated by authors	Subcategories of quality of life instruments	Subcategories of psychological stress instruments	Country	<i>N</i>
Langle et al., 2005	Existenzanalyse	Alcohol or drugs misuse, inpatient setting	Individual	N/A	Meaning in life Social relationships	Other	Austria	337
Langle et al., 2005	Existenzanalyse	Nationwide psychotherapy practices	Individual	N/A	Meaning in life Social relationships	Other	Austria	248
Lee et al., 2006a,b	Meaning-making intervention	Breast cancer	Individual	N/A	Meaning in life Hope Self-efficacy	Anxiety Depression	Canada	18
Makola, 2014a; 2015	General MCT	HIV and AIDS educators	Group	N/A	Meaning in life	Depression	South Africa	24
Makola, 2014b	General MCT	Manager of higher education	Group	N/A	Meaning in life	N/A	South Africa	14
Lai et al., 2012	General MCT General MCT	Student nurses Advanced stage cancer, inpatient setting	Group Individual	N/A N/A	Meaning in life Quality of life	Other N/A	South Africa Hong Kong	80 58
MacKinnon et al., 2015b	General MCT	Bereavement	Group	N/A	Meaning in life	Anxiety Other	Canada	11
Rios, 2012	General MCT	Tuberculosis	Individual	N/A	Meaning in life	N/A	Guatemala	44
Thompson, 2015	Wong's MCT	Substance misuse	Individual	N/A	Meaning in life	Other	Canada	11
Torres & Noblejas de la Flor, 2007	General MCT	Substance misuse	Individual	N/A	Meaning in life	N/A	Spain	66
Ukus et al., 2015	General MCT	Elderly	Individual	N/A	Meaning in life	N/A	Indonesia	15
van der Spek et al., 2014	Meaning-centered group psychotherapy	Cancer, treatment with curative intent	Group	N/A	Meaning in life Hope Self-efficacy Social relationships	Anxiety Depression Other	Netherlands	24
Vos & Hutchinson, 2016	Individual meaning-centered therapy	Cardiovascular disease	Individual	N/A	N/A	Anxiety Other	United Kingdom	120

MCT = meaning-centered therapy; *N* = number; N/A = not applicable; ND = no data available.

Types of control condition: AI = active intervention; CAU = care as usual; WL = waiting list.

Groups of outcome instruments: QoL = general instruments or subscales measuring quality of life; MiL = meaning in life; Hope = hope, hopelessness, and optimism; SE = Self-Efficacy; Soc = social relationships.

Table 4. Description of differences and overlap of the different types of meaning-centered therapy included in the metaanalyses

Differences and overlaps	Types of meaning centered therapy	Description
Differences	Logotherapy	Logotherapy ($k = 12$ studies) has been developed by Frankl (1948/1986) and elaborated by others (e.g., Lukas, 1986/2014, Marshall & Marshall, 2012). Logotherapists assume that all individuals have an inner striving toward meaning (“will to meaning”), that everyone is always free to take a stance toward any conditions in life (“freedom of will”), and that every situation has the potential of being meaningful (Lukas, 2014, p. 14). Usually, logotherapeutic studies are moderately long therapies based on the elaborate therapeutic models of Frankl, embedded in a holistic meaning-centered philosophy and anthropology, and often consists of a range of techniques, including didactics, phenomenological exploration, Socratic dialogue, de-reflection, and paradoxical intention (cf. Lukas, 1986/2014). Logo-autobiography ($k = 2$) is a specific type of logotherapy using autobiographic writing exercises. Lantz & Raiz (2004) has integrated logotherapy with family systems and relationship therapeutic methods ($k = 1$).
	General meaning-centered therapy	General MCT ($k = 30$) is loosely centered around Frankl’s three values (creativity and productivity, inner attitude, and experiencing), and addresses these via psychoeducation, discussion, guided exercises, and homework. The approach is often relatively directive and non-phenomenological.
	Meaning-centered psychotherapy	Meaning-centered psychotherapy ($k = 6$) was originally developed as a structured manualized brief psychotherapy aimed at supporting cancer patients to live a meaningful life despite their disease. Manuals include didactics and exercises about coping with change and physical challenges, systematic exploration of Frankl’s three sources of meaning, but particular attention is given to positively modulating the inner attitude toward the disease. This approach is often relatively directive and nonphenomenological (Breitbart et al., 2012). Meaning-based group counseling for bereavement ($n = 2$) integrates techniques from other therapeutic approaches (Neimeyer et al., 2011) to support individuals in coming to terms with loss of meaning, and explore ways of experiencing meaning in life in the context of grief therapy (MacKinnon et al., 2015a). Meaning-centered therapy for physically ill patients follows the same approach ($k = 1$; Vos & Hutchinson, 2016) but systematically explores five evidence-based sources of meaning, explicates therapeutic-relational skills and coping with existential limitations (Vos, 2016a).
	Meaning-making interventions	Meaning-making interventions ($k = 3$) are narrative storytelling approaches helping cancer patients to review their lives and chronologically embed the cancer experience in the historical context of other important life events (Lee et al., 2006a). This includes a reflection on old and new assumptions about self-worth, controllability of events, and distribution of good and bad outcomes in the world. The clients appraise the current response to cancer, explore past significant life events, the influence of past coping strategies on current situation, and discuss life priorities within the context of mortality.
	Existential analysis	Existential analysis ($k = 2$) elaborates the logotherapeutic theory within a phenomenological, client-directed, and dialogical approach. Clients are supported to develop an authentic and responsible attitude towards their lives and contexts, so they can experience themselves freely and “say yes” with an inner consent to the world (feeling we exist), life (feeling life is good and valuable), self (feeling and showing authentic uniqueness) and meaning: “Yes, I exist, my life is good, I can be myself, and I can achieve my goals” (Langle, 2014, p. 23).

Continued

Table 4. *Continued*

Differences and overlaps	Types of meaning centered therapy	Description
	Meaning-centered counseling or meaning therapy	Meaning-centered counseling or meaning therapy ($k = 1$; Wong, 2013) is a short action-oriented therapeutic approach with specific exercises, based on the theoretical ABCDE model: helping clients to accept events in life, believe in strengths and the possibility of change, commit to actions, discover hidden meanings, and evaluate change and progress.
Overlaps	Therapeutic skills	Analyses of the manuals revealed that the treatments in the controlled trials were homogenous in using meaning-centered didactics, concretizing, and specifying meaning in daily life instead of abstract philosophizing, exploring meanings in the past, focusing on long-term meaning instead of short-term gratification, reflective questions and specific exercises, unconditional positive regard about the ability to experience meaning, stimulating a self-reflective/experiential attitude instead of intellectualizing, recognizing life's limitations such as mortality, and stimulating clients to be responsible for themselves (Vos, 2016a).
	Structure of sessions	Some 40 studies used a similar structure: after sessions introducing the topic of meaning in life and discussing its relevance for clients, every subsequent session focused on another type of meaning (i.e., individual sessions on experiential meanings, attitudinal meanings or productivity–creativity) that was applied to daily life via homework and sessions about specific changes in life.

$SE = 0.20$). As analyses showed large between-study heterogeneity ($I^2 > 90\%$) and positive nonsignificant publication bias, the outcome instruments were recategorized into more specific instrument categories. The subcategories for quality of life that had the least heterogeneity and smaller nonsignificant publication biases were: general quality of life; meaning in life; hope, hopelessness, and optimism; self-efficacy; and social relationships. The least heterogeneous subcategories for psychological stress were depression, anxiety, and existential anxiety (Table 2). Regardless of how the instruments were categorized, heterogeneity remained large ($I^2 > 45\%$), suggesting that other moderators influenced heterogeneity. Therefore, the findings in this step are not further described (see Table 5).

Step 4. Controlled trials were significantly less effective than noncontrolled trials ($d = 0.51$, $p < 0.01$), but there were no significant differences between randomized and nonrandomized controlled trials ($d = 0.11$, $p > 0.05$). Thus, the effect sizes were significantly higher in noncontrolled studies: these effects are caused by the study characteristics and not by the MCT. To compensate

for the effects of this artificial inflation and develop a more valid estimate of the true effect sizes, all further steps were only conducted in controlled trials that had low heterogeneity and high homogeneity. Compared with control groups, MCT had large effect sizes, immediately posttreatment and at follow-up, on quality of life ($g = 1.02$, $SE = 0.06$; $g = 1.06$, $SE = 0.12$) and psychological stress ($g = 0.94$, $SE = 0.07$, $p < 0.01$; $g = 0.84$, $SE = 0.10$). As the immediate effects on quality of life were heterogeneous, subcategories of outcome instruments were analyzed: the effects were larger on general quality of life ($g = 1.37$, $SE = 0.12$) than on meaning in life ($g = 1.18$, $SE = 0.08$); self-efficacy ($g = 0.89$, $SE = 0.14$); social well-being ($g = 0.81$, $SE = 0.13$); and hope, hopelessness, and optimism ($g = 0.80$, $SE = 0.13$). The effects on psychological stress were nonheterogeneous and therefore not further specified (see Table 5).

Steps 5–8. In controlled trials, moderation and metaregression analyses were not significant ($p > 0.05$) with respect to sample, treatment, therapy skills, and study characteristics. In the combination of all controlled and uncontrolled

Table 5. Pre–post effects of meaning-centered therapies on quality of life and psychological stress in the combined group of all trials ($k = 60$): overall effects and effects for significant subgroups

Metaanalytic step	Included outcomes	Measurement moment	Studies, N	Hedges' g	SE	95% CI (lower–upper)	Z	p	Q	$df(Q)$	$p(Q)$	I^2 (%)
Change effects on quality of life												
3.1. Main analyses	Quality of life:	Immediate	49	1.13	0.12	0.91–1.35	10.08	0	656.55	48	0*	92.68**
	All instruments together	Follow-up	16	0.99	0.2	0.59–1.38	4.91	0	198.58	15	0*	92.44
3.2. Significant differences between different outcome instruments	Subgroup of quality of life:	Immediate	11	1.02	0.22	0.58–1.46	4.52	0	66.93	10	0*	85.06
	General quality of life instrument	Follow-up	5***	0.66	0.11	0.43–0.90	4.3	0	1.53	4	0.8	0
	Subgroup of quality of life: Meaning in life	Immediate	29	1.12	0.16	0.79–1.45	6.65	0	346.92	29	0*	91.9
		Follow-up	7	1.01	0.35	0.32–1.70	2.88	0	122.09	7	0*	94.26
	Subgroup of quality of life: Hope, hopelessness, and optimism	Immediate	12	0.74	0.14	0.46–1.01	4.56	0	52.72	11	0*	79.14
		Follow-up	3***	0.72	0.23	0.27–1.17	2.27	0	3.72	2	0.15	46.25
	Subgroup of quality of life: Self-efficacy	Immediate	11	0.93	0.19	0.54–1.30	4.75	0	88.47	10	0*	88.69
		Follow-up	2***	0.56	0.31	0.44–1.15	1.15	0.2	0.85	1	0.35	0
	Subgroup of quality of life: Social relationships	Immediate	12	1.41	0.23	0.96–1.86	6.11	0	255.99	11	0*	95.7
		Follow-up	6	0.97	0.4	0.17–1.76	2.4	0	105.1	5	0*	95.24
Change effects on psychological stress												
3.1. Main analyses	Psychological stress:	Immediate	49	1.21	0.1	1.01–1.42	11.58	0	510.17	48	0*	90.59**
	All instruments together	Follow-up	11	0.67	0.2	0.27–1.05	2.53	0	121	10	0	91.73
3.2. Significant differences between different outcome instruments	Subgroup of stress: all	Immediate	29	1.01	0.12	0.76–1.26	7.96	0	191.4	28	0*	85.37
	Psychiatric diagnoses	Follow-up	5***	0.66	0.11	0.43–0.89	4.8	0	5.87	4	0.2	31.95
	Subgroup of stress: Depression	Immediate	18	0.98	0.15	0.68–1.29	6.4	0	139.99	17	0*	87.85
		Follow-up	5***	0.58	0.17	0.25–0.90	2.28	0	11.35	4	0.02*	64.76
	Subgroup of stress: Anxiety	Immediate	18	0.94	0.15	0.62–1.25	5.89	0	110.58	17	0*	84.62
		Follow-up	4***	0.55	0.12	0.29–0.89	3.07	0	0.63	3	0.88	0
	Subgroup of stress: Existential stress	Immediate	8	1.18	0.23	0.73–1.63	5.13	0	47.61	7	0*	85.29
		Follow-up	3***	0.77	0.21	0.37–1.20	3.19	0	0.98	2	0.61	0
		Follow-up	8	0.84	0.11	0.64–1.05	8.07	0	9.3	7	0.23	24.74

Metaanalytic steps are explained in Table 2. All subgroups/moderators are significant with $p < 0.05$ and Cohen's $d > .50$; SE = standard error; 96^ CI = 95% confidence interval; I^2 test for heterogeneity in %; all Q values for heterogeneity are not significant except where indicated.

*($p < 0.05$).

**Heterogeneity can be explained by significant differences between different outcome instruments (all moderators: Cohen's $d \geq .50$, $p(d) < 0.01$); therefore, the effect sizes for different groups of outcome instruments are presented in this table.

***Number of studies too small to interpret findings, based on a-priori power calculations.

trials, nine MCT therapist skills were moderately strong moderators: studies had larger effect sizes when the treatment manuals did not include religious/spiritual formulations, were structured, explicitly stimulated clients to set and experiment with achievable goals in daily life, used mindfulness exercises, explicitly discussed one type of meaning per session, addressed self-worth, discussed existential limitations, mentioned the coherence of time, and focused on creating a positive therapeutic relationship (respectively, $d = 0.47, 0.39, 0.36, 0.33, 0.32, 0.27, 0.26, 0.24, 0.23$; all $p < 0.01$). Analyses of steps 1–6 with the 25% largest samples, published after 2000, and the 25% most precise effects showed similar effects as the main analyses and are therefore not further described.

- Step 9. Changes in meaning and psychological stress were statistically heterogeneous ($p(Q) = 0.67, I^2 > 75%$). Changes in meaning in life predicted changes in psychological stress with strong negative effects ($\beta = -0.56$, VAF (Variance Accounted For) = 31.4%, $SE = 0.11, p < 0.001$; intercept $\beta = 0.13, SE = 0.10, p = 0.09; N = 20$) (see Table 6).

DISCUSSION

Our findings indicate that MCT largely improves the client's quality of life and reduces their level of psychological stress. Compared with control groups, MCT had larger effects on all outcome instruments. MCT was primarily effective in improving the general quality of life and meaning in life, secondarily in reducing psychological stress, and also in improving social relationships, self-efficacy, and hope/hopelessness/optimism. All positive effects were maintained between 4 and 12 months after the last therapy session.

To put our findings into perspective: these effects seem slightly larger than the moderate-to-large effects of excluded therapies that address meaning as one of many therapeutic aims and methods, such as broad positive psychology interventions, acceptance and commitment therapy, structured life review, and autobiographic writing (Chochinov et al., 2005; Seligman et al., 2005; Sin & Lyubomirsky, 2009; Davis et al., 2015; Ost, 2014; Bohlmeijer et al., 2003;

Ando et al., 2010). Thus, our metaanalysis indicates that clients benefit from explicitly and systematically addressing meaning in life, either as a standalone MCT or as part of a complex treatment. The finding that the effects of MCT are slightly larger than the multiple-aims/multiple-methods interventions may suggest that therapies are more effective when they focus primarily and systematically on meaning.

MCT is based on the hypothesis that the client's level of psychological stress decreases because it helps them to experience life as more meaningful. Indeed, the treatment manuals described therapeutic techniques that directly addressed meaning in life, MCT clients experienced significant improvements in terms of meaning in life, and that these improvements correlated positively with decreased stress—it mediated stress. This is in concord with studies indicating that the meaning-centered coping skills taught in MCT predict better long-term well-being (Folkman, 2008; Park, 2010; Steger, 2012).

These conclusions are based on the most robust studies and a categorization process selected via nine metaanalytic steps. Overall, effects were statistically larger in the short term as opposed to the long term, but the absolute differences were small and the effects large. The differences between instrument categories can be explained by the fact that quality of life and psychological stress are related but different phenomenological experiences. MCT also focuses primarily on improving quality of life, due to which the effects on quality of life are larger than those on psychological stress (Vos et al., 2013). The publications reported herein included trials from all of the continents (save Antarctica) with different client populations, although with an overrepresentation of physical illnesses (which did not significantly influence effect sizes). For example, more trials should be conducted in populations that were absent from the current analyses, such as Africa, South America, Australia, and Russia. Control groups mainly comprised psychological treatments. No differences were found between different types of treatments (e.g., care-as-usual practices or new standardized treatments). Most control groups are considered best practice or the gold standard in the field, which supports the ecological validity of the metaanalytic findings, as these are likely valid estimations of true effect sizes (Cuijpers et al., 2008). Moderator analyses showed that the heterogeneity of the included samples did not lead to statistical heterogeneous findings (the type of MCT was only slightly different in different samples, but the core clinical model was the same, so that there was relatively little clinical heterogeneity). This seems to confirm the hypothesis that MCT is equally effective across different populations.

Table 6. Effects of meaning-centered therapies on quality of life and psychological stress compared with control groups in randomized and non-randomized controlled trials: overall effects and effects for significant subgroups

Metaanalytic step	Included outcomes	Measurement moment	Studies, <i>N</i>	Hedges' <i>g</i>	<i>SE</i>	95% CI (lower-upper)	<i>Z</i>	<i>p</i>	<i>Q</i>	<i>df</i> (<i>Q</i>)	<i>p</i> (<i>Q</i>)	<i>P</i> (%)
Relative effects on quality of life, compared with control groups												
3.1. Main analyses	Quality of life:	Immediate	30	1.02	0.06	0.90–1.14	16.73	0	39.84	29	0.09	27.21**
	All instruments together	Follow-up	10	1.06	0.12	0.82–1.31	8.62	0	14.84	9	0.1	39.37
3.2. Significant differences between different outcome-instruments	Subgroup of quality of life:	Immediate	11	1.37	0.12	1.12–1.62	10.84	0	13.52	9	0.14	33.42
	General quality of life instruments	Follow-up	5	1.33	0.15	1.03–1.62	8.85	0	0.45	4	0.98	0
	Subgroup of quality of life: Meaning in life	Immediate	21	1.18	8.2	1.02–1.33	14.35	0	59.14	20	0	66.18
	Subgroup of quality of life: Hope, hopelessness, and optimism	Follow-up	9	0.85	0.16	0.52–1.18	5	0	26.93	8	0	70.3
	Subgroup of quality of life: Self-efficacy	Immediate	8	0.8	0.13	0.53–1.05	5.98	0	13.72	7	0.56	48.96
	Subgroup of quality of life: Social relationships	Follow-up	3	0.61	0.23	0.15–1.06	2.19	0.03	5.87	2	0.05	65.95
	Subgroup of quality of life: Psychological stress	Immediate	7	0.89	0.14	0.61–1.18	6.2	0	8.41	5	0.13	40.59
	Subgroup of quality of life: All instruments together	Follow-up	1	0.66	0.19	0.28–1.03	3.43	0	0	0	1	0
	Subgroup of quality of life: All instruments together	Immediate	7	0.81	0.13	0.55–1.07	6.12	0	9.03	6	0.17	33.58
Relative effects on psychological stress, compared with control groups												
3.1. Main analyses	Psychological stress:	Immediate	25	0.94	0.07	0.80–1.09	12.64	0	48.99	26	0.01*	46.93
	All instruments together	Follow-up	12	0.84	0.11	0.64–1.05	8.07	0	9.30	7	0.23	24.74

Metaanalytic steps are explained in Table 2.

All moderators are significant with $p < 0.05$ and Cohen's $d > 0.50$.

SE = standard error; 95% CI = 95% confidence interval; I^2 test for heterogeneity in %; all *Q* values for heterogeneity are not significant except when indicated.

* $p < 0.05$.

**Heterogeneity can be explained by significant differences between different outcome instruments (all moderators: Cohen's $d \geq 0.50$, $p(d) < 0.01$).

Therefore, the effects sizes for different groups of outcome instruments are presented in this table.

***Sample size too small to interpret findings, based on a-priori power calculations

The only significant moderators were eight therapeutic skills. The skills predicted larger effect sizes in the analyses of all noncontrolled, controlled, non-randomized, and randomized studies taken together. These skills did not influence effect size in controlled trials, which can be explained by the fact that almost all controlled trials used these therapeutic skills, leaving little variation between the studies. In the light of this, MCT therapists may consider using nonreligious/spiritual formulations, structure, mindfulness, practical goal-setting exercises, focusing on one type of meaning per session, and addressing self-worth, existential limitations, coherence of time, and establishing positive therapeutic relationships.

In the light of the current findings, MCT can be seen as a bona fide intervention from which many clients appear to benefit. This warrants making MCT more widely available. Although effects were statistically similar in clients with primary mental or physical health concerns, from a clinical perspective MCT seems particularly relevant to individuals in transitional moments in life or with a physical disease, as many of them report meaning-centered concerns (Vos, 2016b). For example, the relevance for individuals with a chronic or life-threatening physical disease is underlined by metaanalyses of the 10 MCT trials, showing large effect sizes for physical well-being (Vos, 2016b). Although more cost-effectiveness studies are required, one randomized controlled trial indicated its cost-effectiveness (van der Spek et al., 2014), and our metaanalysis found large effect sizes with a small number of sessions. MCT is therefore strongly recommended for inclusion in healthcare guidelines.

ACKNOWLEDGMENTS

The authors are grateful to the large consortium of colleagues who helped in a range of ways: by searching the literature in multiple languages, by sharing data for metaanalyses, and by proofreading.

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Types of trials included in the metaanalysis (see after date of citation):

* randomized controlled trial

** nonrandomized controlled trial

*** nonrandomized noncontrolled trial

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