

A Meta-Analytic Review of Interventions That Promote Meaning in Life

American Journal of Health Promotion
2021, Vol. 35(6) 866-873
© The Author(s) 2021
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/0890117121995736
journals.sagepub.com/home/ahp



Nicholas Manco, B.S¹  and Sherry Hamby, PhD²

Abstract

Objective: Increasing meaning in life (MiL) among people experiencing disease or adversity may improve coping and resilience. The purpose of this review is to characterize the effects of MiL interventions.

Data Source: A systematic search of PubMed, PsycInfo, and Google Scholar was conducted encompassing the following parameters: meaning in life, purpose in life, or sense of purpose with randomized controlled trials.

Study Inclusion & Exclusion Criteria: Randomized controlled trials (RCTs) of interventions with at least one outcome that measured improvement in MiL and were published in English between January 2000 and January 2020.

Data Extraction & Synthesis: 33 randomized controlled trials ($k = 35$) were identified. Data were coded by authors and a research assistant for intervention type, control group type, and risk of bias. The random effects model of Review Manager 5.3 was used to produce SMD and evaluate heterogeneity.

Results: The effect size for studies with a passive control group was $SMD = 0.85$ (95% CI 0.54 to 1.17) and for studies with an active control group was $SMD = .032$ (95% CI 0.09 to 0.55). Mindfulness programs produced the largest effect size (1.57) compared to passive controls, while narrative programs produced the largest effect relative to active controls (0.61). There was considerable heterogeneity in most estimates.

Conclusion: Several interventions increase MiL, including some that are relatively brief and do not require licensed professionals.

Keywords

meaning in life, intervention, randomized controlled trial, mindfulness, narrative, meaning making

Objective

Meaning in life (MiL) is a concept that dates back thousands of years and has been operationalized in numerous ways. These include a system of beliefs, the pursuit and subsequent achievement of one's goals, or, most commonly, a sense of purpose and connection to something larger than yourself.^{1,2} Modern scholarly interest in MiL began with Viktor Frankl's logotherapy, an approach based on the idea that we are motivated to live purposefully and meaningfully.³ Considerable research supports Frankl's assertion that increasing meaning in life increases well-being, coping, and resilience in many populations.⁴ Implicated in this is the idea that there is more to one's quality of life than just the absence of physical ailments. Interventions designed to increase meaning in life have become a focus of treatment for individuals who have experienced various forms of illness or other adversity.¹ These interventions have taken a range of approaches, including logotherapy, mindfulness, narrative, and psychoeducation. The purpose of this meta-analytic review is to examine the average effect sizes for different types of interventions on measures of meaning in life.

Existing Research on Meaning in Life

There is a very large literature on MiL, also sometimes called "purpose in life" or "sense of purpose",⁵ and a comprehensive review is beyond the scope of this paper. We note the findings of prior efforts to review and summarize this literature, especially reviews of interventions. Winger et al⁶ found in their review that MiL and sense of coherence were related to distress in cancer patients. There have also been reviews of interventions designed to improve meaning in life. Although noting the small number and generally low quality of studies, Vos et al⁷ found that existential therapies can increase positive meaning in life in certain populations, especially those facing physical illness. Wang et al⁸ found that life review interventions can

¹ Yale Child Study Center, Yale University, New Haven, CT, USA

² Department of Psychology, University of the South, Sewanee, TN, USA

Corresponding Author:

Nicholas Manco, Yale Child Study Center, Yale University, 230 South Frontage, New Haven, CT, USA.
Email: nicholas.manco@yale.edu

increase spiritual well-being in patients nearing the end of life. Guerrero-Torrealles et al¹ reviewed MiL interventions in individuals with advanced disease, finding that these interventions benefitted purpose and quality of life. Finally, Chu and Mak⁹ found positive effects of mindfulness-based interventions on meaning in life.

However, prior reviews have been limited either by focusing on a single type of intervention, such as existential therapy, or a single population, such as patients with terminal cancer. A key question for any provider is identifying the intervention with the potential for the largest impact. Toward this end, the current meta-analysis examines the effects of a range of interventions designed to increase meaning in life. We did not limit our search by population, intervention type, or control type. We searched for all randomized controlled trials that had meaning in life as an outcome measure, including psychotherapy, mindfulness, narrative, and psychoeducational programs. This meta-analytic review also includes studies with a range of populations. We also explore whether the type of control group (active or passive) and level of bias in the study (using the Cochrane risk-of-bias coding scheme) affects the results.

Methods

Data Sources

The search process occurred from January–March 2020, beginning with a search of PubMed and APA PsycINFO was conducted encompassing the following parameters: “randomized controlled trial” AND one of the following: “meaning in life” OR “purpose in life” OR “sense of purpose”. See Figure 1 for a flow chart of the search, which yielded 39 and 41 results, respectively. Titles and abstracts were screened independently, narrowing the number of relevant articles to 65 for further examination. Then, a search of Google Scholar was conducted using the same search terms. Given the large number of “hits” and Google’s ranking of results by relevance, pages were screened until reaching an entire page with no relevant articles, screening 70 articles, 5 of which were not duplicated by earlier searches. We also reviewed the reference lists of 6 review articles, yielding 2 additional studies. Eight other articles were identified by reference searches of other papers. The final pool of articles that were further reviewed was 72. Full texts were screened individually by the 2 authors for inclusion, requiring an intervention group, a control group, and baseline and post-trial ratings of MiL. We emailed 4 authors to request data needed for inclusion in the meta-analysis and received one reply with additional data. This process resulted in 33 studies with 35 effect sizes (2 mindfulness articles presented data from 2 datasets, so $k = 35$) with sufficient data for analysis. See Figure 1 for the flow diagram of the search process.

Inclusion and Exclusion Criteria

Randomized controlled trials (RCTs) of interventions with at least one outcome (primary or secondary) that measured

improvement in meaning in life, purpose in life, or sense of purpose were included in this review. These variables were most often measured by the self-report scales of the Meaning in Life Questionnaire,¹⁰ Purpose in Life Questionnaire,¹¹ Quality of Life scale,¹² or the Functional Assessment of Chronic Illness Therapy–Spiritual scale.¹³ We included articles published in English between January 2000 and January 2020.

Data Extraction and Data Synthesis

Results of the trial were extracted and data on intervention type and control type were coded. Studies were independently coded by NM and a research assistant. Interrater agreement averaged 85.0% (range 80.0% to 94.2% across all codes). Discrepancies were resolved by consensus, also involving SH. Data extraction of means and standard deviations were independently extracted by NM and a research assistant and then checked for discrepancies until consensus was reached.

Interventions were categorized as 1 of 6 types: **Psychotherapy** (talk therapy designed to help people eliminate or control troubling symptoms to increase one’s functioning and quality of life. Can be individual, couple, family, or group); **Mindfulness** (techniques for promoting conscious, non-judgmental awareness of the present moment and increasing awareness of thoughts and feelings); **Narrative** (Individuals reviewing and writing about their lives to achieve a sense of peace or empowerment. Most often Life Review or Non-spiritual Reminiscence approaches); **Psychoeducational** (providing information to help people better understand and become accustomed to living with health conditions or dealing with trauma); **Prosocial** (promoting altruistic helping behavior in order to promote the meaning and wellbeing of the helper); **Spiritual reminiscence** (a narrative approach to determining where an individual is on their spiritual journey and relationship with a higher power).

Active controls included studies that provided an alternative treatment with a similar level of contact time versus waitlist or other passive control, such as being provided brochures. The protocol is available from the authors.

Risk of Bias in Individual Studies

Risk of bias was independently assessed using the Cochrane Risk of Bias Tool (RoB 2) by the 2 authors.¹⁴ Categorization was checked by a research assistant. This quality appraisal instrument assesses risk of bias based on the following 5 domains: the randomization process, deviations from the intended interventions, missing outcome data, measurement of the outcome, and selection of the reported result. Each section is rated as low, some, or high risk of bias for each section. For a study to be rated as low risk, it had to be rated as low risk in all 5 domains. A rating of some risk was given for studies with one or more domains rated as “some risk” and no domain rated as “high risk.” A rating of high risk in any domain resulted in the study being rated as high risk.

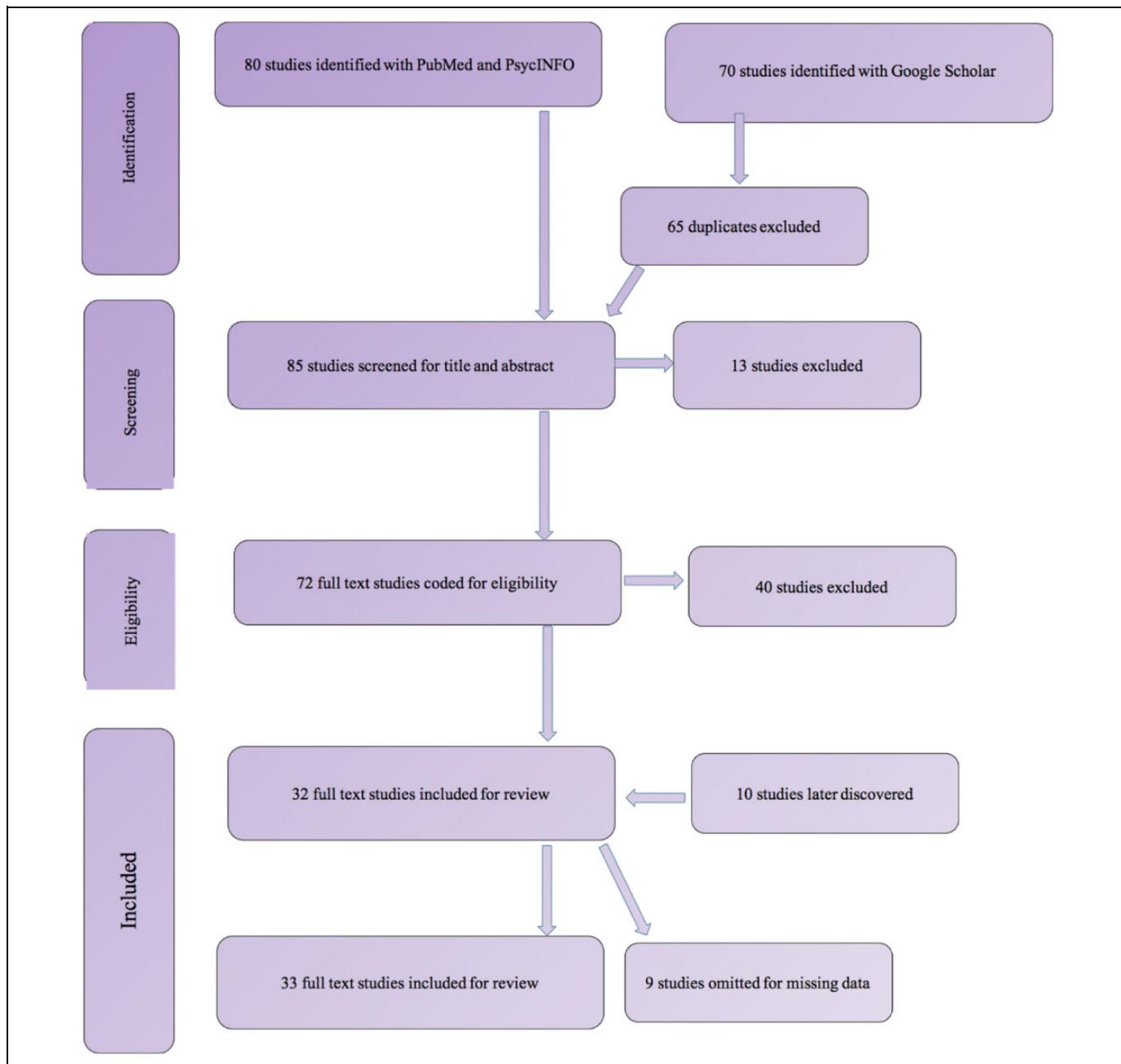


Figure 1. Flow diagram for search process.

Data Analysis

Effects of meaning-making interventions from baseline to post-treatment were analyzed and compared to control interventions in the same time interval. Analyses were conducted using Review Manager (RevMan) 5.3 software. Due to the range of interventions and populations, a random effects model was used. Random effects models are appropriate when effect sizes are thought to differ not only because of random error within studies (as in the fixed effects model), but also from true variation across studies. All outcome measures were continuous, and analyses were based on standardized mean differences

(SMD) with 95% confidence intervals (CI). Standardized mean differences are equivalent to Cohen's *d*. A positive SMD indicated a favorable effect of the meaning-making interventions compared to the control intervention for all outcomes. Heterogeneity was examined with the *Q* statistic. A significant *Q* statistic indicates that the null hypothesis of homogeneity in effect sizes (the preferred result) is rejected.

Results

The 33 articles that met inclusion criteria were published between 2004-2020. The sample sizes for the studies ranged

Table 1. Study Characteristics.

Study	Year	Intervention type	Control group	Sample	N
Allen et al.	2014	Narrative	Active	Palliative care patients	28
Ando et al.	2010	Narrative	Active	Terminally ill cancer patients	68
Bach and Guse	2015	Mindfulness	Passive	Adolescents	44
Bohlmeijer et al.	2008	Narrative	Passive	Older adults with depressive symptomology	93
Bormann et al.	2013	Mindfulness	Active	Veterans w/PTSD	146
Bower et al.	2015	Mindfulness	Passive	Young breast cancer survivors	65
Breitbart et al.	2018	Psychotherapy	Passive	Patients with advanced cancer	123
Carlson et al.	2016	Mindfulness	Active	Distressed breast cancer survivors	252
Chiba et al.	2014	Psychoeducational	Active	Long-term mental illness	46
Chippendale & Boltz	2015	Narrative	Active	Community-dwelling older adults	39
Damreihani et al.	2018	Psychoeducational	Passive	Mothers of children with cancer	40
Das et al.	2019	Psychoeducational	Passive	Worksite employees	220
Dik et al.	2015	Spiritual Reminiscence	Passive	Christian clients	101
Fard et al.	2018	Mindfulness	Passive	Women with infertility	30
Fillion et al.	2009	Psychoeducational	Passive	Palliative care nurses	109
Garland et al.	2019	Mindfulness	Active	Patients with opioid treated chronic pain	95
George and Singer	2011	Prosocial	Active	Persons with mild to moderate dementia	30
Hallford and Mellor	2016	Narrative	Active	Young adults with depression	28
Henry et al.	2010	Psychotherapy	Passive	Patients with advanced ovarian cancer	24
Hsiao et al.	2016	Mindfulness	Active	Breast cancer survivors and their partners	80
Ivtzan et al.	2018	Mindfulness	Passive	Hong Kong Chinese and British participants	79
Jacobs et al.	2011	Mindfulness	Passive	Participants submitted applications that were screened	60
Lan et al.	2018	Narrative	Active	Older adults with frailty	74
MacKinnon et al.	2015	Psychotherapy	Active	Bereft individuals	20
Mosher et al.	2017	Prosocial	Active	Advanced gastrointestinal cancer patients	50
Robatmili et al.	2015	Psychotherapy	Passive	Iranian university students	20
Rodin et al.	2018	Psychotherapy	Active	Patients with advanced cancer	305
Saeedi et al.	2019	Psychotherapy	Passive	Patients with cancer	61
van der Speck et al.	2017	Psychotherapy	Passive	Cancer survivors	97
Waite and Richardson	2004	Psychotherapy	Passive	Worksite employees	138
Westerhof et al.	2010	Narrative	Passive	Older adults with slight depressive symptomology	171
Wolever et al.	2010	Psychoeducational	Passive	Patients with Type 2 diabetes	56
Wu and Koo	2015	Spiritual Reminiscence	Passive	Elderly with mild and moderate dementia	103
				Total n	2895

from 15-305, with an average sample size of 87.72 (SD = 67.63). The overall percentage of female participants was 69.3%. The studies' interventions were grouped into the following 6 categories: mindfulness¹⁵⁻²³ (9 studies, $k = 11$), psychotherapy^{4,24-30} (8), narrative³¹⁻³⁷ (7), psychoeducational³⁸⁻⁴² (5), prosocial^{43,44} (2), and spiritual reminiscence^{45,46} (2). Forty-two percent of the studies used active control groups, with the rest utilizing passive or waitlist controls. See Table 1 for study characteristics.

Analyses of Effect Sizes

The overall effect size for all studies, regardless of whether they used active or passive controls, was $SMD = 0.62$ (95% CI 0.410 to 0.829); see the forest plot in Figure 2. However, there was considerable heterogeneity in the scores, with a highly significant Q statistic of 233.7 ($p < .0001$). The 19 studies ($k = 20$) that employed passive control groups had an average effect size (SMD) = .852 (95% CI 0.543 to 1.171), with a Q statistic of 163.5 ($p < .0001$). The 14 studies ($k = 15$) with active control groups had an average effect size that was less

than half of that; $SMD = 0.323$ (CI 0.093 to 0.552), with a Q statistic of 47.0 ($p < .0001$). The results indicate that these kinds of programs can successfully increase a person's sense of meaning.

Four intervention categories had studies with both active and passive control groups. The mindfulness studies with active control groups^{16,18,20,21} ($k = 5$) had an average effect size (SMD) = 0.165 (CI -0.175 to 0.506), $Q = 13.9$ ($p < .001$), while the mindfulness studies with a passive control group^{15,17,19,22,23} ($k = 6$) had an average effect size (SMD) = 1.565 (CI 0.435 to 2.70), $Q = 79.8$ ($p < .0001$). The psychoeducational study with an active control group³⁸ had an average effect size (SMD) = 0.181 (CI -0.399 to 0.760) $Q = 0.0$ ($p < .0001$), the psychoeducational studies with passive control groups³⁹⁻⁴² (4) had an average effect size (SMD) = 0.829 (CI 0.052 to 1.606), $Q = 36.6$ ($p < .0001$). The psychotherapy studies with active control groups^{26,28} (2) had an average effect size $SMD = 0.220$ (CI 0.002 to 0.438), $Q = 0.01$ ($p > .90$), the psychotherapy studies with passive control groups^{4,24,25,27,29,30} (6) had an average effect size (SMD) = 0.688 (CI 0.430 to 0.947) $Q = 8.1$ ($p < .15$). The

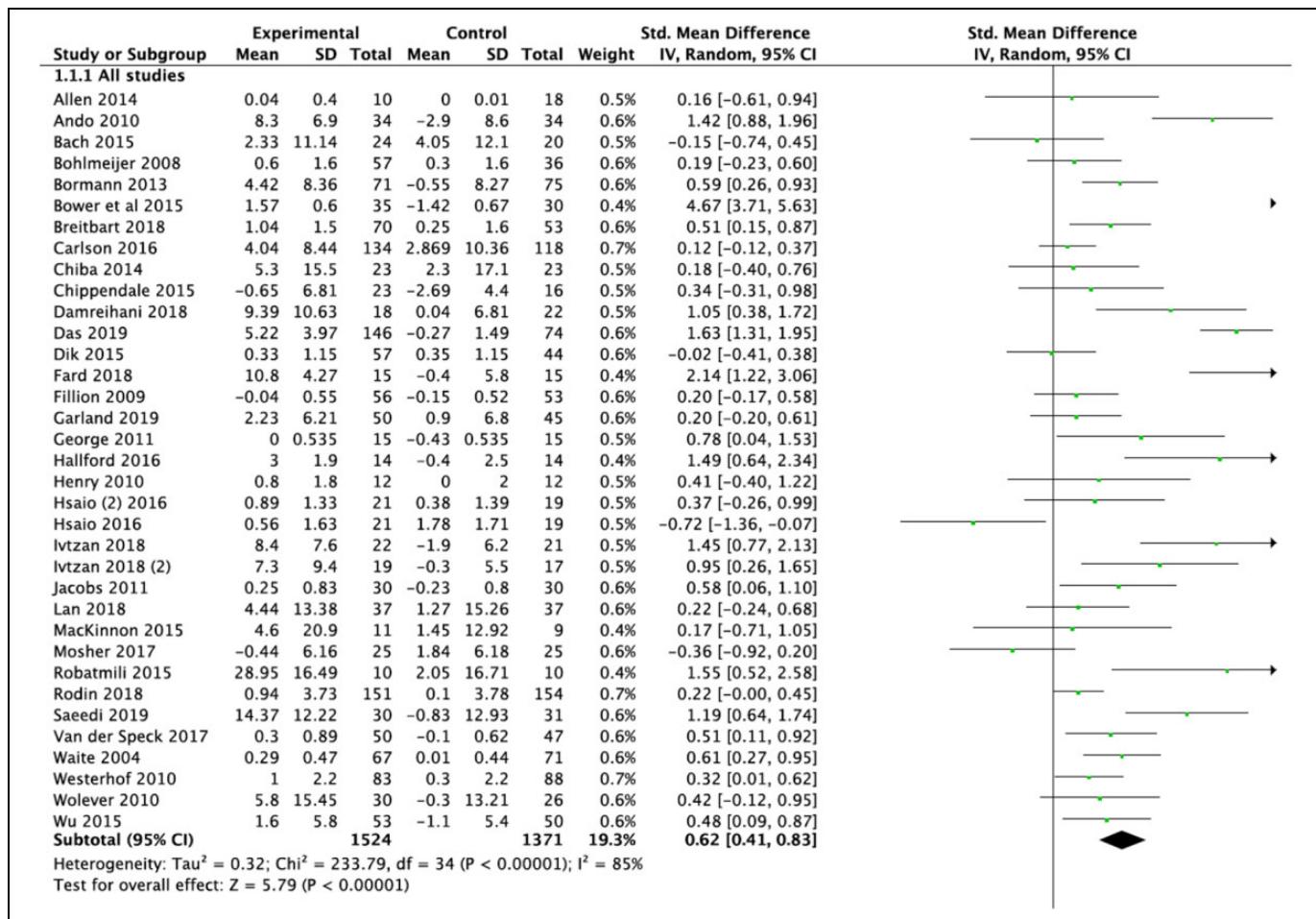


Figure 2. Forest plot of all studies.

narrative studies with active control groups³¹⁻³⁶ (6) had an average effect size SMD = 0.606 (CI 0.121 to 1.092), $Q = 21.0$ ($p < .001$), the narrative study with a passive control group³⁷ had an average effect size SMD = 0.317 (CI 0.015 to 0.619), $Q = 0.0$ ($p = 1.0$).

Both prosocial studies had active control groups. The effect size for the prosocial interventions was SMD = 0.181 (CI -0.940 to 1.302) with a Q score of 5.8 ($p < .02$). This score was not different from zero, but because these studies had an active control group, this result only indicates that prosocial interventions were not better than alternatives. Both spiritual reminiscence studies had passive control groups. Nonetheless, they still showed a small average effect size that was not differ from zero; SMD = 0.230 (CI -0.255 to 0.716) with a Q score of 3.1, ($p < .08$).

Effect sizes did not differ much as a function of bias rating. Five articles were rated as high in bias,^{30,33,35,38,43} with an average effect size (SMD) = .556 (CI 0.184 to 0.927) with a Q score of 9.5 ($p = .051$). The articles rated as some bias had a similar average effect size (SMD) = 0.621 (CI 0.382 to 0.903) with a Q score of 233.8 ($p < .0001$). One article rated low in bias²⁸ and had an effect size (SMD) = 0.223 (CI 0.115 to -0.002) (no Q score is reported because there was only one study).

Conclusions & Discussion

Current evidence suggests that meaning making is a key strength that promotes better biopsychosocial outcomes⁴⁷ and increases in meaning making are a likely mechanism for many effective psychosocial interventions. In this meta-analytic review of interventions that promote meaning making, moderate evidence for improvements in meaning making were found, with a significant overall effect size of 0.62. Analyses by type of control group found that interventions compared to a waitlist or other passive control group had an average effect size of .85, while studies with an active control group had an average effect size of only .32.

Mindfulness interventions showed the largest effect size (1.57) compared to waitlist or other passive controls, while narrative programs showed the largest effect size (0.61) compared to active control groups. Psychotherapy and psychoeducational interventions also showed significant, nonzero effect sizes, especially in comparison to a passive control. The 2 prosocial interventions did not show effects different from zero, but because both had an active control group, it can only be said that they were not better than the alternative presented. The 2 spiritual reminiscence programs also were not different

from zero, despite both being compared to passive control, suggesting caution in that approach despite the limitations of currently available data.

There was substantial heterogeneity in most effect sizes, suggesting caution in interpreting results and the need for more data. We examined risk of bias and found that studies with lower methodological quality did not affect the strengths of these associations. Interestingly, the 5 studies rated as high in bias had slightly smaller effects size as those rated lower in bias.

Our findings were largely in line with prior, more narrow reviews,⁶⁻⁹ and the public health significance of this study lies chiefly in its comparisons of interventions across populations, which can provide guidance to providers and policymakers regarding the best use of scarce resources. As of the date of this review, mindfulness and narrative interventions are best supported. However, most located studies involved non-clinical populations or clinical populations with cancer or other diseases, with only a few involving people with known psychiatric diagnoses. Other have noted the limited literature on MiL among psychiatric patients as well as evidence that MiL can be an important protective factor against psychiatric issues such as suicidality.^{48,49} More work is needed to determine if the most effective interventions might vary for other populations. Hopefully more future studies will follow standards set by Cochrane, CONSORT guidelines, or other RCT standards. Studies with larger sample sizes may help reduce heterogeneity and allow for more distinction across intervention types.

Limitations

There are some limitations to note. In the existing body of literature, many of the trials had small cell sizes, and almost every paper was rated with at least some level of bias. Older studies seldom used intention-to-treat analyses or pre-registered their protocols. Further, compared to medication trials, it is usually not possible in psychology studies to have fully masked trials where neither provider nor client is aware of the condition. Regarding our search process, it is always possible that we missed some pertinent studies that were not included in major indices or cited in the literature we reviewed by hand.

Implications for Providers

In terms of practice implications, we note that interventions such as mindfulness and narrative typically do not require licensed professionals and may be more accessible to many people than psychotherapy, which was also effective but not more so than other alternatives. In comparison to active control groups, narrative had the highest effect size, suggesting that this approach may offer benefits in addition to common standards of care. Although few of these studies were app-based or online, there are many free online versions of mindfulness and narrative programs. More research is needed to see if these have similar effects, but this is an avenue worth pursuing. For providers seeking to improve meaning in life in their clients, there are several effective choices.

SO WHAT? (Implications for Health Promotion Practitioners & Researchers)

What is already known on this topic?

Higher levels in meaning in life are associated with improved well-being and other positive outcomes and increasing meaning in life is an important mechanism for many interventions.

What does this article add?

This meta-analytic review found that many common interventions increase meaning in life, including mindfulness, narrative, psychoeducational programs, and psychotherapy. Mindfulness and narrative showed the largest effect sizes relative to passive and active controls, respectively. The limited existing data on prosocial interventions (such as volunteering) and spiritual reminiscence suggest minimal impacts for these programs. Mindfulness and narrative are both relatively brief interventions that do not require licensed professionals to administer and have potential to be scaled up and provide access to effective interventions even for people with limited access to health care.

Authors' Note

SH conceived the study, NM and SH acquired the data, NM and SH prepared the data analysis plan and analyzed the data, NM wrote the manuscript, and SH critically revised the manuscript.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Nicholas Manco  <https://orcid.org/0000-0002-0112-9880>

References

1. Guerrero-Torrelles M, Monforte-Royo C, Rodríguez-Prat A, Porta-Sales J, Balaguer A. Understanding meaning in life interventions in patients with advanced disease: a systematic review and realist synthesis. *Palliat Med*. 2017;31(9):798-813.
2. Hamby S, Segura A, Taylor E, Grych J, Banyard V. Meaning making in rural Appalachia: age and gender patterns in seven measures of meaning. *J Happiness Well-being*. 2017; 5(2):168-186.
3. Frankl VE. Logotherapy and existential analysis—a review. *Am J Psychother*. 1966;20(2):252-260.

4. van der Spek N, Vos J, van Uden-Kraan CF, et al. Efficacy of meaning-centered group psychotherapy for cancer survivors: a randomized controlled trial. *Psychol Med.* 2017;47(11):1990.
5. George LS, Park CL. Meaning in life as comprehension, purpose, and mattering: Toward integration and new research questions. *Rev Gen Psychol.* 2016;20(3):205-220.
6. Winger JG, Adams RN, Mosher CE. Relations of meaning in life and sense of coherence to distress in cancer patients: a meta-analysis. *Psychooncology.* 2016;25(1):2-10.
7. Vos J, Craig M, Cooper M. Existential therapies: a meta-analysis of their effects on psychological outcomes. *J Consult Clin Psychol.* 2015;83(1):115.
8. Wang C-W, Chow AYM, Chan CLW. The effects of life review interventions on spiritual well-being, psychological distress, and quality of life in patients with terminal or advanced cancer: a systematic review and meta-analysis of randomized controlled trials. *Palliat Med.* 2017;31(10):883-894.
9. Chu ST-W, Mak WWS. How mindfulness enhances meaning in life: A meta-analysis of correlational studies and randomized controlled trials. *Mindfulness.* 2020;11(1):177-193.
10. Steger MF, Frazier P, Oishi S, Kaler M. The meaning in life questionnaire: assessing the presence of and search for meaning in life. *J Couns Psychol.* 2006;53(1):80.
11. Crumbaugh JC, Maholick LT. An experimental study in existentialism: the psychometric approach to Frankl's concept of noogenic neurosis. *J Clin Psychol.* 1964;20(2):200-207.
12. Burckhardt CS, Anderson KL. The Quality of Life Scale (QOLS): reliability, validity, and utilization. *Health Qual Life Outcomes.* 2003;1(1):60.
13. Peterman AH, Fitchett G, Brady MJ, Hernandez L, Cella D. Measuring spiritual well-being in people with cancer: the functional assessment of chronic illness therapy—Spiritual Well-being Scale (FACIT-Sp). *Annals of Behavioral Medicine.* 2002;24(1):49-58.
14. Sterne JAC, Savović J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ.* 2019. doi:10.1136/bmj.l4898
15. Bach JM, Guse T. The effect of contemplation and meditation on 'great compassion' on the psychological well-being of adolescents. *J Posit Psychol.* 2015;10(4):359-369.
16. Bormann JE, Thorp SR, Wetherell JL, Golshan S, Lang AJ. Meditation-based mantram intervention for veterans with post-traumatic stress disorder: a randomized trial. *Psychol Trauma Theory Res Pract Policy.* 2013;5(3):259.
17. Bower JE, Crosswell AD, Stanton AL, et al. Mindfulness meditation for younger breast cancer survivors: a randomized controlled trial. *Cancer.* 2015;121(8):1231-1240.
18. Carlson LE, Tamagawa R, Stephen J, Drysdale E, Zhong L, Speca M. Randomized-controlled trial of mindfulness-based cancer recovery versus supportive expressive group therapy among distressed breast cancer survivors (MINDSET): long-term follow-up results. *Psychooncology.* 2016;25(7):750-759.
19. Fard TR, Kalantarkoush M, Faramarzi M. Effect of mindfulness-based cognitive infertility stress therapy on psychological well-being of women with infertility. *Middle East Fertil Soc J.* 2018;23(4):476-481.
20. Garland EL, Hanley AW, Riquino MR, et al. Mindfulness-oriented recovery enhancement reduces opioid misuse risk via analgesic and positive psychological mechanisms: a randomized controlled trial. *J Consult Clin Psychol.* 2019;87(10):927.
21. Hsiao F-H, Jow G-M, Kuo W-H, et al. The long-term effects of mindfulness added to family resilience-oriented couples support group on psychological well-being and cortisol responses in breast cancer survivors and their partners. *Mindfulness (N Y).* 2016;7(6):1365-1376.
22. Ivitan I, Young T, Lee HC, Lomas T, Daukantaitė D, Kjell ONE. Mindfulness based flourishing program: a cross-cultural study of Hong Kong Chinese and British participants. *J Happiness Stud.* 2018;19(8):2205-2223.
23. Jacobs TL, Epel ES, Lin J, et al. Intensive meditation training, immune cell telomerase activity, and psychological mediators. *Psychoneuroendocrinology.* 2011;36(5):664-681.
24. Breitbart W, Pessin H, Rosenfeld B, et al. Individual meaning-centered psychotherapy for the treatment of psychological and existential distress: a randomized controlled trial in patients with advanced cancer. *Cancer.* 2018;124(15):3231-3239.
25. Henry M, Cohen SR, Lee V, et al. The Meaning-Making intervention (MMi) appears to increase meaning in life in advanced ovarian cancer: a randomized controlled pilot study. *Psychooncology.* 2010;19(12):1340-1347.
26. MacKinnon CJ, Smith NG, Henry M, et al. Reconstructing meaning with others in loss: a feasibility pilot randomized controlled trial of a bereavement group. *Death Stud.* 2015;39(7):411-421.
27. Robatmili S, Sohrabi F, Shahrok MA, Talepasand S, Nokani M, Hasani M. The effect of group logotherapy on meaning in life and depression levels of Iranian students. *Int J Adv Couns.* 2015; 37(1):54-62.
28. Rodin G, Lo C, Rydall A, et al. Managing cancer and living meaningfully (calm): a randomized controlled trial of a psychological intervention for patients with advanced cancer. *J Clin Oncol.* 2018;36(23):2422.
29. Saeedi B, Khoshnood Z, Dehghan M, Abazari F, Saeedi A. The effect of positive psychotherapy on the meaning of life in patients with cancer: a randomized clinical trial. *Indian J Palliat Care.* 2019;25(2):210.
30. Waite PJ, Richardson GE. Determining the efficacy of resiliency training in the work site. *J Allied Health.* 2004;33(3):178-183.
31. Allen RS, Harris GM, Burgio LD, et al. Can senior volunteers deliver reminiscence and creative activity interventions? Results of the legacy intervention family enactment randomized controlled trial. *J Pain Symptom Manage.* 2014;48(4):590-601.
32. Ando M, Morita T, Akechi T, Okamoto T, Japanese Task Force for Spiritual Care. Efficacy of short-term life-review interviews on the spiritual well-being of terminally ill cancer patients. *J Pain Symptom Manage.* 2010;39(6):993-1002.
33. Bohlmeijer ET, Westerhof GJ, Emmerik-de Jong M. The effects of integrative reminiscence on meaning in life: results of a quasi-experimental study. *Aging Ment Heal.* 2008;12(5):639-646.
34. Chippendale T, Boltz M. Living legends: effectiveness of a program to enhance sense of purpose and meaning in life among community-dwelling older adults. *Am J Occup Ther.* 2015; 69(4):6904270010p1-6904270010p11

35. Hallford DJ, Mellor D. Autobiographical memory-based intervention for depressive symptoms in young adults. *Psychother Psychosom*. 2016;85(4):246-249.

36. Lan X, Xiao H, Chen Y, Zhang X. Effects of life review intervention on life satisfaction and personal meaning among older adults with frailty. *J Psychosoc Nurs Ment Health Serv*. 2018; 56(7):30-36.

37. Westerhof GJ, Bohlmeijer ET, Van Beljouw IMJ, Pot AM. Improvement in personal meaning mediates the effects of a life review intervention on depressive symptoms in a randomized controlled trial. *Gerontologist*. 2010;50(4):541-549.

38. Chiba R, Miyamoto Y, Kawakami N, Harada N. Effectiveness of a program to facilitate recovery for people with long-term mental illness in Japan. *Nurs Health Sci*. 2014;16(3):277-283.

39. Damreihani N, Behzadipour S, Haghpanh S, Bordbar M. The effectiveness of positive psychology intervention on the well-being, meaning, and life satisfaction of mothers of children with cancer: a brief report. *J Psychosoc Oncol*. 2018;36(3):382-388.

40. Das SK, Mason ST, Vail TA, et al. Effectiveness of an energy management training course on employee well-being: a randomized controlled trial. *Am J Heal Promot*. 2019;33(1):118-130.

41. Fillion L, Duval S, Dumont S, et al. Impact of a meaning-centered intervention on job satisfaction and on quality of life among palliative care nurses. *Psychooncology*. 2009;18(12):1300-1310.

42. Wolever RQ, Dreusicke M, Fikkan J, et al. Integrative health coaching for patients with type 2 diabetes. *Diabetes Educ*. 2010;36(4):629-639.

43. George DR, Singer ME. Intergenerational volunteering and quality of life for persons with mild to moderate dementia: results from a 5-month intervention study in the United States. *Am J Geriatr Psychiatry*. 2011;19(4):392-396.

44. Mosher CE, Secinti E, Johns SA, et al. Examining the effect of peer helping in a coping skills intervention: a randomized controlled trial for advanced gastrointestinal cancer patients and their family caregivers. *Qual Life Res*. 2018;27(2): 515-528.

45. Dik BJ, Scbolljegerdes KA, Ahn J, Shim Y. A randomized controlled trial of a religiously-tailored career intervention with Christian clients. *J Psychol Christ*. 2015;34(4).

46. Wu L, Koo M. Randomized controlled trial of a six-week spiritual reminiscence intervention on hope, life satisfaction, and spiritual well-being in elderly with mild and moderate dementia. *Int J Geriatr Psychiatry*. 2016;31(2):120-127.

47. Hamby S, Grych J, Banyard V. Resilience portfolios and poly-strengths: Identifying protective factors associated with thriving after adversity. *Psychology of Violence*. 2018;8(2): 172-183.

48. Costanza A, Prelati M, Pompili M. The meaning in life in suicidal patients: the presence and the search for constructs. A systematic review. *Medicina*. 2019;55(8):465.

49. Costanza A, Baertschi M, Richard-Lepouriel H, et al. The presence and the search constructs of meaning in life in suicidal patients attending a psychiatric emergency department. *Front Psychiatry*. 2020;11:327.