Special Issue: Technology and Aging: Intervention Research

Online Therapy for Depressive Symptoms: An Evaluation of Counselor-Led and Peer-Supported Life Review Therapy

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Abstract

Objectives: Life review therapy is recognized as an evidence-based treatment for depression in later life. The current article evaluates an online life review therapy in middle-aged and older persons, comparing a counselor-led to a peer-supported mode of delivery.

Methods: A pilot randomized controlled trial (RCT) was carried out with 3 conditions and 4 measurement points: (a) online life review therapy with online counseling, (b) online life review therapy with online peer support, and (c) a waitlist control condition. A mixed methods study provided insight in the reach, adherence, effectiveness, user experiences, and acceptability.

Results: Fifty-eight people were included in the study. The intervention *reached* a vulnerable group of mainly middle-aged, college-educated women. The pilot RCT on *effectiveness* showed that participants in all conditions improved significantly in depressive symptoms, engaged living, mastery, and vitality, but not in ego integrity and despair, social support, loneliness, and well-being. The *adherence*, *user experience*, and *acceptability* were better in the counselor condition than in the peer condition. No differences were found between middle-aged and older adults.

Conclusion: Despite the nonsignificant effects, possibly due to the small sample size, online life review therapy might be a good method for alleviating depressive symptoms in people in their second half of life. Further research is needed, addressing how online life review is best offered.

Keywords: Depression, Life review, Mental health (services, therapy), Technology

A long tradition of research has shown that *how* people reminisce about their lives is related to their well-being and mental health (Westerhof, Bohlmeijer, & Webster, 2010). Recollecting vivid positive memories, evaluating negative memories, and integrating memories across different phases of the lifespan are of particular importance (Westerhof & Bohlmeijer, 2014). Life review therapy combines these insights with psychotherapeutic methods in order to change negative reminiscence styles and support mental health and well-being (Westerhof et al., 2010).

Life review therapy is recognized as an evidence-based treatment for depression in later life with similar effect sizes as cognitive behavioral therapy (Bohlmeijer, Smit, & Cuijpers, 2003; Pinquart & Forstmeier, 2012; Scogin, Welsh, Hanson, Stump, & Coates, 2005). The current article evaluates an innovative, internet-based way of delivering life review therapy for depressive symptoms. We were especially interested in the possibilities of a counselor-led versus a peer-supported mode of delivery to both middle-aged and older persons.

In everyday life, digital technologies play an increasingly important role in reminiscence and life review where they serve as a kind of external autobiographical memory (Westerhof, 2017). Social media, like Facebook, Instagram, or Youtube, allow storing and sharing memories as well as triggering and stimulating processes of reminiscence and life review (Thomas & Briggs, 2016). Digital technologies are increasingly used to promote reminiscence and life review in interventions, for example, in online life story books (Lazar, Thompson, & Demiris, 2014). However, an evaluation of a completely online life review therapy is still lacking.

Meta-analyses have shown that internet-based therapies, like cognitive behavioral therapy, are effective in treating depressive symptoms (Sander, Rausch, & Baumeister, 2016). Internet therapies are attractive to those who are open to communicate their thoughts and emotions in a virtual relationship (Beattie, Shaw, Kaur, & Kessler, 2009). They can be followed in one's own place and time and are often perceived as flexible, anonymous, and non-stigmatizing (Cuijpers, van Straten, Warmerdam, & Van Rooy, 2010). Furthermore, they are attractive to health care organizations as they fit the shifting focus toward more self-management in care (Van Gemert-Pijnen, Peters, & Ossebaard, 2013) and can be cost-effective (Buntrock et al., 2017).

An important question is what *mode of delivery* of internet-based interventions would be best for online life review therapy. There has been some debate on the role of counselors versus peers in life review therapy (Korte, Drossaert, Westerhof, & Bohlmeijer, 2014). Individual therapy provides the best opportunities to adapt to personal needs and sensitive issues (Haight, Coleman, & Lord, 1995) whereas group therapy allows for social exchange and learning from peers (Birren & Deutchman, 1991).

Previous studies on internet-based interventions have mainly compared counselor-led to unguided interventions and found that the previous are more effective (Griffiths, Farrer, & Christensen, 2010). Some studies showed that peer supported internet-based interventions contribute to empowerment of clients (Melling & Houguet-Pincham, 2011) and reduction of depressive symptoms (Griffiths et al., 2012). However, studies that directly compare the effects of counselor-led and peer-supported interventions are lacking.

A second important question concerns the *target age group* of internet-based life review therapy. Older adults are among the fastest growing group of internet users. For example, 8 out of 10 Dutch persons between 65 and 75 years have used the internet on a weekly basis in 2013, a figure doubled since 2005 (CBS, 2015). However, their internet skills still tend to lag behind those of younger generations (Van Deurzen & Van Dijk, 2015). It is therefore important to evaluate an online format across different age groups.

Over the past decades, life review therapy has been developed especially for older adults (Westerhof et al., 2010). However, people tend to think back and reflect on their lives throughout the lifespan and not only in later life (Fivush et al., 2011). It is nowadays acknowledged that reminiscence serves a variety of integrative, instrumental, and social functions besides death acceptance in the latest phase of life (Westerhof & Bohlmeijer, 2014). Hence, life review therapy might be effective in other age groups as well (Hallford & Mellor, 2016; Lamers, Bohlmeijer, Korte, & Westerhof, 2015).

We carried out an evaluation of online life review therapy, comparing counselor-led and peer-supported delivery among middle-aged and older adults. The evaluation was guided by five participant-related issues that play a role in the use and effectiveness of internet interventions: reach, adherence, effectiveness, user experience, and acceptability (Berry, Lobban, Emsley, & Bucci, 2016; Feather et al., 2016; Kelders, Kok, Ossebaard, & Van Gemert-Pijnen, 2012; Kohl, Crutzen, & de Vries, 2013).

Internet interventions tend to reach a limited group of often middle-aged, higher educated women (Kelders, Bohlmeijer, & Van Gemert-Pijnen, 2013). It is therefore important to know more about the *reach* of the intervention: we compare participant characteristics to the general population as well as to a face-to-face group format of life review therapy (Korte, Bohlmeijer, Cappeliez, Smit, & Westerhof, 2012) and a self-help format with email counseling (Lamers et al., 2015).

A systematic review of web-based interventions showed that often only around 50% of the participants adhere fully to the program: participants start easily, but also quit easily (Kelders et al., 2012). The second question therefore concerns the *adherence* to the intervention.

As meta-analyses have shown that both internet interventions (Sander et al., 2016) and life review therapy (Pinquart & Forstmeier, 2012) can be effective, we assessed how *effective* their combination in online life review therapy is in diminishing depressive symptoms. We were also interested in the effects of integrative processes (ego-integrity and despair; Lamers et al., 2015), instrumental processes (engaged living and mastery; Cappeliez & Robitaille, 2010), social processes (social support and loneliness; Korte et al., 2014), as well as in general positive outcomes (vitality and well-being; Westerhof et al., 2010).

The experience of technology-mediated therapy contributes to therapeutic success, just as therapeutic relations are important in face-to-face therapy. Understanding the user experience could therefore further improve online therapy (Feather et al., 2016). Our fourth question was how users *experienced* the online life review therapy, the contacts with counselor or peers, and the intensity of the intervention.

Last, insights in the interest in and willingness to engage with online interventions are important to keep participants engaged (Berry et al., 2016). We therefore conducted

an interview study on the *acceptability* of the intervention in an interview study.

Methods

Design

The core of our study was a pilot randomized controlled trial (RCT) with three parallel groups (a) Online life review therapy, supported with online counseling (counselor condition), (b) online life review therapy with online peer support (peer condition), and (c) a waitlist control condition (waitlist condition). Participants were randomized based on an automatic, computer-generated list, after they signed informed consent and were included in the study. They received the intervention through internet on their personal computers in their own home and filled out questionnaires online at four measurement points: preintervention (baseline measurement), postmeasurement (3 months after baseline), first follow-up (6 months after baseline), and second follow-up (12 months after the baseline). Participants randomized to the waitlist condition could participate in the intervention after 6 months and did not participate in the second follow-up. As part of this study, we assessed baseline characteristics of the participants (*reach*), changes in primary and secondary outcomes across time (*effectiveness*), actual use of the intervention (*adherence*), and participants' postintervention evaluations (*user experiences*). We assessed interest and willingness to engage (*acceptability*) in an interview study at the second follow-up.

Intervention

The intervention *The stories we live by* integrates life review with narrative therapy. Bohlmeijer and Westerhof (2013) provide an interpretive case study that describes the dynamics of the therapy. Two earlier studies showed that the intervention is effective in a face-to-face group format (Korte et al., 2012) and as a self-help book with email counseling (Lamers et al., 2015). For the current study, the self-help book was adapted to a completely online context (see Supplementary Materials for a detailed description of the intervention).

There are six modules that can be carried out at home during a period of 12 weeks: younger years and family; adolescence and becoming an adult; work and care; love and friendship; old and new goals; reading your life. The first four modules focus on life themes across the life course from birth to present. In each module, participants were asked questions about the life theme to more easily access relevant autobiographical memories. Next, they were asked to recollect a vivid positive memory as well as to describe a difficult memory. They were guided by narrative therapeutic questions to evaluate and attribute new meanings to the difficult memory. The last two modules focus on the entire life course from the past to the near future in order to integrate memories across different phases of the lifespan.

In the *counselor condition*, participants carried out their homework and received bi-weekly feedback and support by a trained counselor. The counselors were two Master students in Psychology who received a training to respond from a narrative therapeutic perspective. A licensed health psychologist supervised the students by providing recommendations before the online messages were sent out to the participants.

Participants in the *peer condition* were randomly assigned to groups of four participants. They carried out the assignments individually and selected which of the weekly assignments they wanted to share with their peers. Participants received instructions about how to provide supportive feedback to other participants. They gave each other feedback every other week. The same two Master students supervised by the licensed health psychologist moderated the conversations and gave recommendations when the participants did not provide supportive feedback.

The *waitlist condition* did not receive an intervention. Participants were allowed to seek any support they deemed necessary in dealing with their depressive symptoms.

Participants

Participants were recruited through advertisements in magazines and newsletters for aging adults. Inclusion criteria were an age of 40 years or older and the presence of light to moderate depressive symptoms (Center for Epidemiological Studies-Depression Scale [CES-D] > 10; Beekman et al., 1997). Applicants were excluded when they reported that they started a medication treatment for depressive symptoms within the past 3 months or were currently receiving any other psychological (self-help) treatment for depressive symptoms. Other exclusion criteria were not having enough time to participate in the intervention, having problems with the Dutch language or not having an email address and internet access. Last, presence of severe depressive symptoms and a moderate or high risk of suicidality were exclusion criteria (assessed in a telephone psychiatric interview; Mini International Neuropsychiatric Interview; Sheehan et al., 1998; Van Vliet & de Beurs, 2007; Sheehan Disability Scale; Leon, Olfson, Portera, Farber, & Sheehan, 1997).

We expected a moderate effect size (Cohen's $d = .50$), based on a meta-analysis (Pinquart & Forstmeier, 2012) and earlier studies on the intervention (Korte et al., 2012; Lamers et al., 2015). Using a one-sided alpha of .05, a power of .80, and a dropout of 20%, 62 participants were needed per condition, or 186 in total.

Instruments

Baseline measurement included demographic characteristics (age, gender, educational level, marital status, living

situation, daily activities, internet usage) and health (a visual analogue scale on general health; a 5-point item on subjective health; a 3-point item on health limitations).

The primary outcome of the pilot RCT was *depressive symptoms* as measured with the CES-D (Beekman et al., 1997; 20 items, 4-point scale). Secondary outcomes were ego-integrity and despair, engaged living, mastery, social support, loneliness, vitality, and positive mental health. The *Northwestern Ego-Integrity Scale* (Westerhof, Bohlmeijer, & McAdams, 2017; 9 items; 6-point scale) measures ego integrity and despair. The *Engaged Living Scale* (Trompetter et al., 2013; 16 items; 5-point scale) measures an engaged response style. *Mastery* was measured with the Pearlin Mastery Scale (Pearlin, Lieberman, Menaghan, & Mullan, 1981; 5 items; 5-point scale). *Social support* was measured with the short version of the Social Support List—Interactions (SSL-I; Kempen & van Eijk, 1995; 12 items; 4-point scale). *Loneliness* was measured with the Dutch loneliness scale (de Jong-Gierveld & Kamphuis, 1985; 11 items dichotomized 3-point scale). *Vitality* was measured with a subscale of the MOS SF-36 (Ware & Sherbourne, 1992; 4 items; 6-point scale). *Well-being* was measured with the Dutch Mental Health Continuum-Short Form (MHC-SF; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011; 14 items; 6-point scale). All scales had adequate to good reliability in our study (Cronbach alpha ranges from .61 for despair to .91 for social support).

The *adherence* was assessed by automatically recording the actual use of the different functionalities of the application in a logfile for each participant. We used these logfiles to calculate for each participant the number of times logged in, the number of times the help function was consulted, the number of modules finished, the number of visits, the number of downloads of assignments per finished module and the number of communications with the counselor or the peers.

Participants in the counselor and peer condition were asked evaluative questions on the *user experience* of the intervention: 8 on the intervention, 5 on the online contact with the counselor or peers, and 11 on the intensity of the intervention as well as two open questions on their experience and recommendations (Table 3).

Participants were invited for a telephone interview about the *acceptability* of the intervention after the second follow-up. All participants were asked questions on their interest for an online intervention (e.g., for which reasons did you choose an online intervention?) and for both conditions (e.g., did you prefer an individual counselor or peer group feedback?). Nonadherent participants were asked for their reasons to quit (e.g., what was the decisive reason to quit the course?), whereas adherent participants were asked questions about their engagement with counselor or peers, depending on which condition they were in.

Analyses

We used univariate descriptive statistics (percentages, means, and standard deviations) to describe the group of participants we reached. Bivariate statistics (chi-square, *t*-test, analysis of variance [ANOVA]) provide insight in differences between conditions and age groups in baseline characteristics, adherence, and user experience. A binary logistic regression analysis assessed selective dropout of the study. To analyze the effects of the intervention, we carried out a mixed model analysis with correlated residuals for the repeated measure time (baseline, posttreatment, and first follow-up) within the random effect for subject. We specified three fixed factors: condition (waitlist vs counselor vs peer), age group (40–54 years and 55 years and older), and time (baseline, posttreatment, and first follow-up measurement) as well as their interactions. We tested several covariance types for the repeated factor and compared the model fit (2 log likelihood, Akaike Information Criterion, and Baseysian Information Criterion) to find the best fitting type. For each dependent variable this was the heterogeneous first-order autoregressive type. We used the expected marginal means to compute the difference in Cohen's *d* between the conditions at follow-up (below .33 is small; between .33 and .55 is moderate; above .55 is large; Lipsey et al., 1993). In each of the two experimental conditions, we used paired *t*-tests comparing the second follow-up (12 months after baseline) with the first follow-up (6 months after baseline) to assess whether effects were maintained in the long term.

A thematic analysis was carried out to summarize the answers to open questions and interviews. We used the method of constant comparison to develop codes that were driven by the responses the participants gave. New codes were developed when answers did not fit already established codes. We started with a large number of codes that were next grouped into meaningful themes when they had a similar connotation. Each coherent part of an answer that constituted a meaningful unit (mostly a couple of words or a sentence) was coded in terms of a theme. We explain the themes and provide citations to substantiate them in the results section. We did not quantify the results, as we were mainly interested in the content and variation in answers of the participants.

Results

Question 1: Reach

Figure 1 presents the participant flow. The age of the 58 participants ranged from 40 to 79 years (mean 53.8; standard deviation [*SD*] = 8.4). Somewhat less than half of them were 55 years or older (44.8%). Most were female (77.6%) and college educated (89.8%). One in three participants were married (34.5%), somewhat more than half were living together with a partner and/or children (55.2%) and had a paid job (56.9%). The average health score was 64.1 on the visual analogue scale from 1 to 100 (*SD* = 14.4),
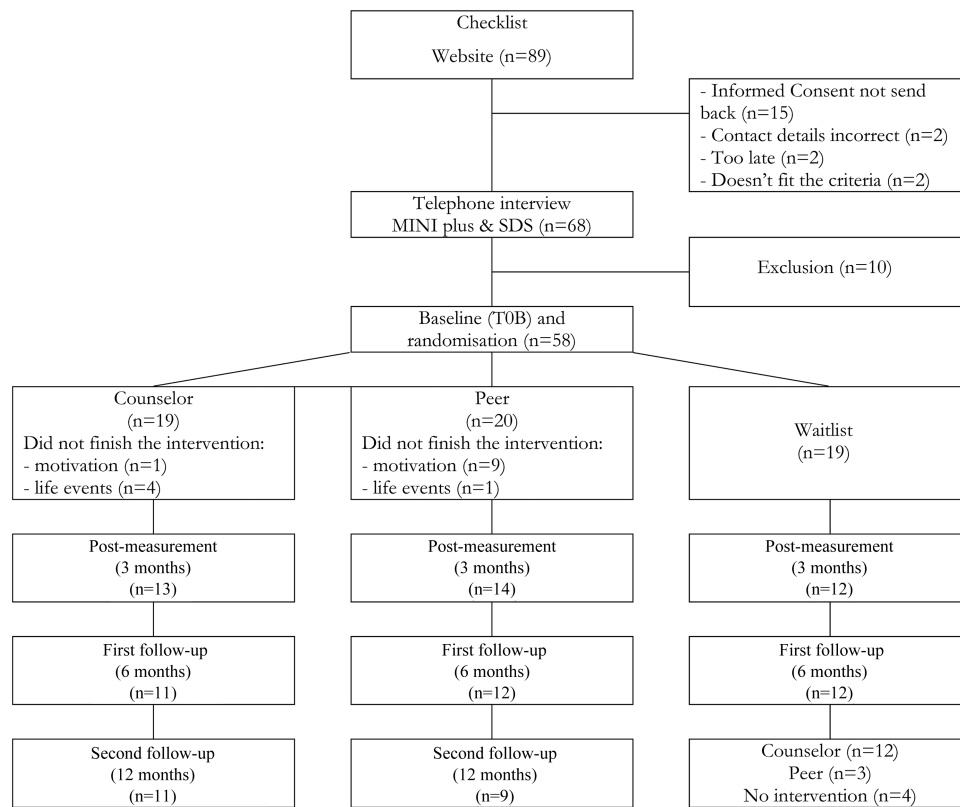
Figure 1. Flow chart of participants.

whereas 60.3% rated their health as good to excellent and 41.4% reported no health impairments. Most participants (63.8%) used the internet 1 or 2 hr a day and 69.0% reported that they had (very) much internet experience. There were few differences between the age groups, but middle-aged participants (40–55 years) more often lived together [$\chi^2(1) = 5.3$; $p = .021$] and more often had a job [$\chi^2(1) = 4.1$; $p = .043$].

Participants had higher levels of depressive symptoms and despair and lower levels of ego integrity, engaged living, mastery, and well-being than the general population (Table 1). They had similar levels of functioning as participants in the face-to-face or self-help formats of the intervention, but were somewhat younger, more often female, and higher educated. There were no differences according to age group in these psychosocial variables (all analyses with $p > .05$). Hence, a vulnerable group was reached among middle-aged, female, and well-educated people in their second half of life.

Question 2: Adherence

Figure 1 shows the intervention drop-out: 5 participants did not finish the counselor condition versus 10 in the peer condition [$\chi^2(1) = 2.3$; $p = .129$]. Drop-outs in the counselor condition mainly experienced important life events, like hospitalization, whereas drop-outs in the peer condition were mainly not motivated [$\chi^2(1) = 7.4$; $p = .007$]. Only one group of four participants finished the intervention in

the peer condition, three groups had two adherent participants and one group stopped altogether.

Table 2 provides the information on adherence. The use of the application was in general higher in the counselor condition than in the peer condition, although not always significant. Participants in the counselor condition visited the modules significantly more often and downloaded the assignments significantly more often. There were no significant differences between the age groups (all t-tests with $p > .05$).

Question 3: Effectiveness

There were no significant differences between the three conditions (counselor, peer, waitlist) in demographic and health characteristics, except that there were more men in the waitlist condition (42.1%) than in the counselor (15.8%) or the peer condition (10.0%; $\chi^2(2) = 6.5$; $p = .039$). A multivariate ANOVA showed that the baseline measurements of the primary and secondary outcome measures did not differ significantly across the three conditions ($F_{18,96} = 1.5$; $p = .095$). Hence, the *randomization* succeeded, with exception of the gender of the participants.

Figure 1 shows the *study drop-out*. A stepwise binary logistic regression analysis with participation in the second follow-up as dependent variable and condition, background characteristics as well as baseline measures of primary and secondary variables as independent variables

Table 1. Characteristics of the Participants

Variable	Study		Mean	SD
Background characteristics				
Age	Current study		53.8	8.4
	Korte and colleagues (2012)	Face-to-face (55+ years)[a]	63.3	6.5
	Lamers and colleagues (2015)	Self-help (40+ years)[b]	56.9	9.2
Gender (female)	Current study		77.6%	
	Korte and colleagues (2012)	Face-to-face	76.7%	
	Lamers and colleagues (2015)	Self-help	77.0%	
Education (higher)	Current study		89.9%	
	Korte and colleagues (2012)	Face-to-face	29.7%	
	Lamers and colleagues (2015)	Self-help	41.3%	
Depressive symptoms	Current study		22.2	5.4
	Brailean and colleagues (2016)	Dutch over 55 years	7.8	7.8
	Korte and colleagues (2012)	Face-to-face	20.6	9.4
	Lamers and colleagues (2015)	Self-help	23.7	8.8
Ego integrity	Current study		3.8	1.0
	Westerhof and colleagues (2015)	Dutch over 50 years	4.2	0.8
	Lamers and colleagues (2015)	Self-help	4.1	0.8
Despair	Current study		3.9	0.9
	Westerhof and colleagues (2015)	Dutch over 50 years	2.9	1.0
	Lamers and colleagues (2015)	Self-help	4.0	0.8
Engaged living	Current study		44.7	7.6
	Trompetter and colleagues (2013)	Dutch over 18 years	60.8	7.8
	Trompetter and colleagues (2013)	Pain patients	50.9	9.8
Mastery	Current study		14.8	2.6
	Timmer and Aartsen (2003)	Dutch over 55 years	17.8	3.4
	Korte and colleagues (2014)	Face-to-face	14.8	3.4
Well-being	Current study		3.2	0.7
	Lamers and colleagues (2011)	Dutch over 18 years	4.0	0.9
	Korte and colleagues (2012)	Face-to-face	3.4	0.8
	Lamers and colleagues (2015)	Self-help	3.2	0.7

[a]The study of Korte and colleagues (2012) evaluated "*The stories we live by*" as a face-to-face group intervention for adults older than 55 years.
[b]The study of Lamers and colleagues (2015) studied "*The stories we live by*" as a self-help book with email counseling for adults older than 40 years.

Table 2. Results on Adherence From Log Data

	Counselor (n = 19)				Peer (n = 20)				t(38)	Cohen's d
	Mean	SD	Min	Max	Mean	SD	Min	Max		
General										
Log in	52.0	34.1	4.0	132.0	53.3	39.4	5.0	136.0	−0.1	−0.03
Help function	7.8	5.9	0.0	17.0	8.6	6.9	0.0	23.0	−0.4	−0.12
No. of modules started	5.1	1.6	1.0	6.0	3.9	2.4	0.0	6.0	1.9	0.59
No. of modules finished	4.8	2.1	0.0	6.0	3.5	2.7	0.0	6.0	1.7	0.53
No. of visits per module started	4.3	4.1	0.0	17.2	2.3	1.8	0.0	6.0	2.0*	0.65
No. of assignments downloaded per finished module	3.1	2.1	0.0	10.0	1.6	2.0	0.0	9.0	2.2*	1.56
No. of messages per started module										
Sent message to counselor	0.7	0.3	0.0	1.0	—	—	—	—		
Opened message from counselor	1.6	1.0	0.0	4.3	—	—	—	—		
No. of messages to group forum per started module										
Opened new messages to own posts	—	—	—	—	1.5	1.5	0.0	4.2		
Opened messages to group members	—	—	—	—	3.8	3.6	0.0	11.3		
Placed message to group members	—	—	—	—	1.8	1.7	0.0	4.8		

Note: *t*-tests show no significant differences between the conditions.

Table 3. Results on Primary and Secondary Outcomes (Estimated Marginal Means)

Variable (Range)	Condition	Baseline		Postintervention		Follow-up		Cohen's *d* at follow-up	Condition	Time	Condition × Time
		Mean	SE	Mean	SE	Mean	SE				
Depressive symptoms (0–60)	Waitlist	21.32	1.25	15.76	1.35	17.52	1.22		2.56	25.35*	0.81
	Counselor	21.16	1.25	14.68	1.30	14.41	1.28	−0.57			
	Peer	24.05	1.22	17.27	1.25	16.37	1.22	−0.21			
Ego integrity (1–6)	Waitlist	3.83	0.22	3.92	0.26	4.03	0.26		0.15	0.90	2.17
	Counselor	3.65	0.22	3.92	0.26	3.81	0.26	−0.20			
	Peer	3.90	0.22	3.93	0.25	3.50	0.25	−0.47			
Despair (1–6)	Waitlist	4.32	0.20	4.09	0.24	4.03	0.26		3.58*	2.18	0.91
	Counselor	3.47	0.20	3.14	0.23	3.57	0.26	−0.40			
	Peer	3.91	0.20	3.67	0.22	3.77	0.25	−0.23			
Engaged living (16–80)	Waitlist	42.84	1.72	47.03	2.17	46.09	2.35		1.46	9.77*	0.53
	Counselor	44.00	1.72	49.90	2.13	48.45	2.39	0.23			
	Peer	47.15	1.67	50.02	2.04	51.61	2.30	0.54			
Mastery (1–5)	Waitlist	2.80	0.11	2.78	0.15	2.90	0.18		1.19	3.80*	0.92
	Counselor	2.91	0.11	3.20	0.14	3.15	0.18	0.32			
	Peer	2.80	0.10	2.93	0.14	3.18	0.18	0.36			
Social support (1–4)	Waitlist	2.34	0.12	2.54	0.12	2.43	0.12		3.44*	3.10	0.14
	Counselor	2.19	0.12	2.39	0.12	2.29	0.12	−0.27			
	Peer	2.58	0.11	2.70	0.11	2.68	0.11	0.49			
Loneliness (0–11)	Waitlist	7.68	0.73	6.84	0.88	7.21	0.99		1.03	2.93	1.13
	Counselor	7.37	0.73	5.45	0.86	6.68	1.00	−0.12			
	Peer	6.25	0.72	5.88	0.83	5.07	0.96	−0.50			
Vitality (1–6)	Waitlist	2.61	0.16	3.10	0.23	2.70	0.26		3.25*	10.62*	2.05
	Counselor	2.84	0.16	3.25	0.22	3.55	0.27	0.75			
	Peer	2.98	0.16	3.53	0.21	3.76	0.25	0.94			
Well-being (1–6)	Waitlist	3.00	0.17	3.12	0.20	2.98	0.23		2.67	1.70	0.28
	Counselor	3.07	0.17	3.36	0.19	3.25	0.23	0.26			
	Peer	3.50	0.16	3.64	0.19	3.63	0.22	0.64			

*$p < .05$.

showed no significant predictors for drop-out of the study. Hence, there was no selective study drop-out.

The results of the mixed models for the primary outcome, depressive symptoms, as well as the secondary outcomes can be found in Table 3. For depressive symptoms, there is a significant effect over time, but no significant interaction between condition and time. Across all conditions, depressive symptoms improve between baseline and postintervention and remain similar at the first follow-up. There was no significant interaction with age group (40–54 years and 55 years and older). At follow-up there is a moderate difference (Cohen's d) between the counselor and the waitlist condition and a small difference between the peer and the waitlist condition. For those who also participated in the second follow-up, 1 year after the start of the intervention, paired *t*-tests showed that there is a significant difference between the second and the first follow-up in the counselor condition ($t(9) = -3.6$; $p = .006$), but not in the peer condition ($t(8) = 0.7$; $p = .517$), suggesting that effects were better maintained in the peer condition in the longer term.

There were no significant interactions between condition, age group, and time for all secondary outcomes. In all conditions, there was a significant improvement of engaged living, mastery, and vitality across time. At follow-up there were small to moderate differences (Cohen's d) in engaged living and mastery as well as large differences in vitality between the intervention conditions and the waitlist condition. The paired *t*-tests showed that despair declined in the counselor condition at the second follow-up, 1 year after the baseline ($t(9) = -2.3$; $p = .048$). They also showed that there is an improvement in well-being in the peer condition at the longer term ($t(8) = 2.8$; $p = .022$). No further *t*-tests were significant.

Question 4: User Experience

At post-test, participants in the counselor and peer condition evaluated the intervention. Overall, the quantitative analyses showed that the evaluations were positive (above the midpoint of the respective scales; Table 4). The counselor condition was in general more positively evaluated than the peer condition, but there were only significant differences in terms of general satisfaction about the intervention and recommendation of the intervention to acquaintances. Participants also spent significantly more time in the counselor than the peer condition. There were no differences between the age groups (all *t*-tests with $p > .05$).

Table 4. Results on Process Evaluation

	Range	Counselor (N = 15)		Peer (N = 15)		t(29)	Cohen's d
Evaluation of the online intervention							
Intervention general	1–10	7.4	1.1	6.7	1.4	1.6	0.59
Satisfied in general	1–4	3.1	0.5	2.8	0.7	1.5	0.55
Quality of the intervention	1–4	2.9	0.8	2.7	0.8	0.7	0.24
Satisfy your needs	1–4	2.8	0.7	2.3	0.6	2.3*	0.84
Kind of help you hoped for	1–4	2.7	0.8	2.5	0.8	0.4	0.16
Help cope with complaints	1–4	2.9	0.6	2.5	0.8	1.5	0.54
Recommend to acquaintances	1–4	3.2	0.8	2.4	0.7	2.9*	1.06
Start over again	1–4	2.8	0.9	2.2	0.9	1.8	0.66
Evaluation of contacts							
Contact general	1–10	7.7	2.0	6.2	2.5	1.8	0.64
Computer contact: pleasant	1–4	3.5	1.0	3.1	1.1	1.1	0.39
Computer contact: personal	1–4	3.0	0.9	2.7	1.2	0.9	0.32
Computer contact: meaningful	1–4	3.4	1.1	3.3	1.0	0.4	0.13
Missed other forms of contact	1–3	1.9	0.9	2.1	0.8	−0.4	−0.16
Evaluation of the intensity							
Hours spent per week	0–10	4.2	2.5	2.3	1.2	2.6*	0.96
Amount of help received	1–4	3.1	0.6	2.7	0.6	1.8	0.65
Number of modules (6)?	1–5	2.6	0.5	2.6	0.7	0.0	0.00
Number of weeks (12)?	1–5	2.5	0.5	2.8	0.8	−1.1	−0.41
Number of assignments	1–5	3.1	0.5	3.1	0.5	0.0	0.00
Quantity of text	1–5	3.2	0.6	3.3	0.5	−0.4	−0.13
Number of examples	1–5	3.3	0.9	3.2	0.7	0.2	0.08
Quantity of contact	1–5	2.6	0.6	2.3	0.8	1.3	0.46
Number of peers	1–5	—	—	2.8	0.9		

*$p < .05$.

In response to an open evaluative question, participants mentioned three positive and one negative theme: the intervention, the writing process, the things they learned, and disappointment. Positive remarks about the intervention were, for example, "it gave me structure" or "it confronted me with personal life experiences." The writing process was also mentioned: "by reflecting and writing, I became more aware of my life." Gains were for example "it gave me insight," "I discovered a thread in my life," "I started to think more positively" or "it brought more balance in my life."

A few participants were disappointed, for example, "It did not contribute much to the insights I already had before the intervention."

In response to an open question about improvements of the intervention, participants mentioned three themes: contact, technology, and time investment. With regard to contact, participants would like to have more (profound) contact with the counselor or peers: "I missed Personal contact"; "I found the counselor more facilitating than counseling." Some mentioned technical problems: " I had difficulty saving my work on the tablet." With regard to time investment, some would have preferred more time per module ("some more time for the lessons"), whereas others thought the modules did not advance quick enough: "the time frame in which the six lessons are offered is far too long."

Question 5: Acceptability

Interviews were held with 15 participants in the counselor condition and 17 in the peer condition. Other participants could no longer be reached or were not motivated to participate. Five themes were found in the interview study regarding the acceptability of the intervention: the online format, the preference for a counselor-led or peer-supported format, reasons for discontinuing the intervention, the counselor relationship, and the peer relationships.

In the interview study, most participants stated that they preferred an *online format*, because they could follow the course in their own time and their own home: "you can follow the course in your own time through internet." Some also preferred the anonymity of the online intervention: "your relative anonymity makes it easier to talk about certain things." Others mentioned the communication as a negative aspect: they stated to regret that they could only communicate in writing and with a delay in time, for example, "when you give an answer and want to go deeper, that is not possible at that moment, that is a pity." Some participants also reported technical problems, for example, "whole parts of the text disappeared." However, most of them were satisfied with the technical support that "quickly resolved their problems."

Most participants had a *preference* for an individual trajectory with a counselor, whereas some had no clear preference and only a few had a preference for the peer group. Participants with a preference for the counselor did not want to share their stories with other participants ("I would rather share my experience with a single person and not a whole group"). A person with no preference mentioned that "most important for me was to receive feedback from someone, and it didn't matter to me whether that was a peer or a counselor." Participants who preferred the peer condition would like to share their stories and learn from other people: "because you hear stories of others and learn from them."

Participants gave several *reasons for discontinuing the intervention*. In both conditions participants mentioned personal circumstances as reason (e.g., "a lot of work to do", "summer holidays") and others that it was hard to be confronted with their past or their complaints ("my complaints worsened as a result of the confrontation with the past, so it was too early for me to do this course"). The peer aspect was a reason for some participants to quit the peer condition: they did not feel comfortable reading the stories of their peers, they did not recognize themselves in stories of persons of different age groups, or they did not get response from others. For example, "I hear stories from peers that are more difficult and touching than my own."

Participants were more positive than negative about the *counseling relationship*. Participants mentioned that the guidance was substantive with "stimulating questions," "new insights," and "valuable advice." Counselors were seen as friendly, positive, and personal. Others mentioned that the counseling was "impersonal": "I had the impression that the answers came from a book". A few also said that the time between the online messages was "too long" or that there was no possibility "to really engage in a conversation."

Participants were somewhat more negative than positive about the *peer relations*. The most important theme was that they didn't feel connected to their peers. They did not like to share their stories with people they never met or felt obliged to respond: "you have to be kind of a counselor." Some did not like to read about the problems of peers who experienced rather different problems than their own: "I did not need to hear all the problems of other people." Others explained that their peers were not open, did not respond empathically or did not react or even had quit the intervention: "sometimes I thought: you really don't get it." By contrast, participants also mentioned that there was an engaged and intensive contact with other group members who are at the same level: "It was really nice to discuss with someone." Some were "empathic" to their peers and could give them "good advice," whereas they also felt "supported" by their peers. Others were open to share their stories with people they didn't know and liked the openness of their peers as well: "So much was exposed in depth."

Discussion

Life review therapy is an effective intervention to treat depressive symptoms in later life (Bohlmeijer et al., 2003;

Pinquart & Forstmeier, 2012; Scogin et al., 2005). Given the increasing use of digital technologies, also in older age groups, an online life review therapy appears to be a timely innovation. In this study, we compared a format that was led online by a counselor to an online format with peer support in middle-aged and older persons. The intervention *reached* a vulnerable group of mainly somewhat younger, college educated women. The *adherence* was stronger in the counselor condition than in the peer condition. The pilot RCT on *effectiveness* showed that all participants improved significantly in depressive symptoms, engaged living, mastery, and vitality, but not in ego integrity and despair, social support, loneliness, and well-being. The *user experience* and *acceptability* were in general positive, but somewhat more so for the counselor than the peer condition. Except that more middle-aged persons were reached, there were no differences between the age groups in adherence, effectiveness, and user experience.

This is the first study to evaluate a completely online life review therapy for depressive symptoms. Unlike meta-analyses on online interventions (Sander et al., 2016) and on life review therapy (Pinquart & Forstmeier, 2012), online life review therapy did not result in a stronger decrease in depressive symptoms as compared to the waiting list control group. First, depressive symptoms also declined in the waiting list control group. This was also found in a study on life review as self-help with email guidance (Lamers et al., 2015), but not in a study on life review as face-to-face group intervention (Korte et al., 2012). Although the baseline levels of depressive symptoms are not much different between these studies, digital formats might have a lower threshold for people to start, so there might be some more spontaneous recovery in this group. Second, the life review might have been somewhat less profound as no changes were found in ego integrity or despair. Last, as a result of the recruitment problems and the nonadherence, we have to be careful in drawing conclusions about the effectiveness. A lack of statistical power might account for the lack of significant effects, as the moderate effect size between the counselor and waitlist condition in depressive symptoms at follow-up is in the expected range (Korte et al., 2012; Lamers et al., 2015; Pinquart & Forstmeier, 2012).

Participants were in general satisfied with the online delivery of the intervention. They mentioned reasons to participate in an online intervention that were also found in other studies (Beattie et al., 2009; Cuijpers et al., 2010): the perceived anonymity and the flexibility to carry out assignments in their own time and place. Although participants were in general positive about the contacts in the intervention, some would have preferred more profound personal contact. A good blending between online and face-to-face contact might be a solution, for example, doing assignments via online modules, but discussing thoughts and feelings face-to-face (Van der Vaart et al., 2014). The recollection of memories might be easier stimulated online, whereas evaluating and integrating memories might demand more face-to-face counseling.

We compared a counselor-led and a peer-supported form of life review therapy. Although there were no differences in effectiveness, the counselor condition resulted in better adherence, user experiences, and acceptability than the peer condition. Almost half of the participants in the peer condition did not adhere to the intervention, which is not uncommon in online interventions (Kelders et al., 2012). From the interviews it became clear that most participants would have preferred individual counseling and that some had difficulty establishing contact with their peers. Given the large age range of participants, the different life circumstances of middle-aged and older adults might have contributed to the difficulties in establishing contacts. This might also be related to the random assignment to peer groups. Hence, the intervention did not have the advantages of a group intervention for all participants (Korte et al., 2014). As some participants evaluated the peer support positively, it would be worthwhile to study the effects when participants select the peer support mode and their peers themselves, for example, based on a short introductory statement by each participant. A better mix between counselor and peer feedback might be helpful: the counselor could provide more in-depth feedback directed at the integrative functions of reminiscence, whereas peers could support the social functions of reminiscence (Korte et al., 2014).

We evaluated the online intervention in middle-aged and older adults. As in other studies, the intervention mainly attracted higher educated middle-aged women (Kelders et al., 2013). Nevertheless, the middle-aged and older groups were both vulnerable in terms of depressive symptoms and psychosocial functioning. Both age groups also did not differ in terms of adherence, effectiveness, or user experience. On the one hand, life review therapy might indeed match continuities in thinking back and reflecting on life throughout the lifespan (Fivush et al., 2011; Westerhof & Bohlmeijer, 2014). On the other hand, the older adults who participate in the online intervention might be the early adopters of their generation. The increasing use of digital technologies will quickly expand the possible user groups in midlife and beyond.

It proved hard to include the required number of persons, despite an extension of the recruitment period and extra means for advertising. This compromised the statistical power of the study. Furthermore, we focused on individual participants as this was a first experimental study on online life review therapy. Further research should also include stakeholders like counselors, mental health institutes, and health insurance companies, to assess the adoption, implementation, and maintenance of online life review therapy in everyday mental health practice (Kessler et al., 2013). Such research might also shed further light on the question which blend between face-to-face and online contact and between counselor and peer support works best to support which functions of reminiscence and life review in individuals of different ages.

Supplementary Material

Funding

Acknowledgements

Conflict of Interest

None declared.

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