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Precious memories: a randomized controlled trial on the effects of an autobiographical memory intervention delivered by trained volunteers in residential care homes

Gerben J. Westerhof ^a, Joanneke Korte^b, Sander Eshuis^c and Ernst T. Bohlmeijer ^a

^aDepartment of Psychology, Health, and Technology, Center for Ehealth and Well-Being Research, University of Twente, Enschede, The Netherlands; ^bLivio, Enschede, The Netherlands.; ^cLiberein, Enschede, The Netherlands.

ABSTRACT

Objectives: This study assesses the effects of an autobiographical memory intervention on the prevention and reduction of depressive symptoms in older persons in residential care. Trained volunteers delivered the intervention.

Methods: A randomized controlled trial was carried out with depressive symptoms as the primary outcome. The experimental condition received the intervention Precious Memories one-on-one, whereas the control condition had individual unstructured contacts with a volunteer. Participants were 86 older persons living in residential care. There were three measurements: pre-intervention, post-intervention (2 months after the first measurement), and follow-up (8 months after the first measurement). Besides depressive symptoms, the retrieval of specific positive memories was measured as a process variable. Anxiety, loneliness, well-being, and mastery were assessed as secondary outcomes.

Results: Depressive symptoms improved equally in the intervention and the control condition at post-measurement. Participants with clinically relevant depressive symptoms also maintained the effects at follow-up in both conditions. The retrieval of specific positive memories improved more in the autobiographical memory intervention, although this was not maintained at follow-up. Anxiety and loneliness improved equally well in both conditions, but no effects were found for well-being or mastery.

Conclusion: It is concluded that volunteers can deliver the intervention and contribute to the mental health of this highly vulnerable group of older adults.

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KEYWORDS

Depression; reminiscence therapy; institutional care; volunteers

Depression is a major problem in residential care homes, due to the physical, mental, and social vulnerability of residents. Estimates are that between 4% and 25% of residents suffer from a major clinical depression, whereas 29–82% experience minor depression or depressive symptoms (Seitz, Purandare, & Conn, 2010). This shows the need for interventions that help to prevent and reduce depressive symptoms in this population. The present manuscript describes a randomized controlled trial on the effects of such an intervention, based on the retrieval of specific, positive autobiographical memories, and carried out by trained volunteers.

Several meta-analyses have shown that reminiscence and life review interventions that focus on the retrieval and evaluation of personal memories are successful in reducing depressive symptoms in older adults (Bohlmeijer, Smit, & Cuijpers, 2003; Pinquart et al., 2007; Pinquart & Forstmeier, 2012). Reminiscence therapy is recognized as an evidence-based intervention for depression in later life (Scogin, Welsh, Hanson, Stump, & Coates, 2005). In recent years, such interventions have been strengthened with insights from cognitive psychological research on autobiographical memory (Westerhof & Bohlmeijer, 2014). A persistent finding is that depressed persons tend to overgeneralize, i.e. they have difficulty activating episodic memories of specific events that took place on a particular day and place (Sumner, Griffith, & Mineka, 2010; Williams et al., 2007). These findings apply to people with depressive

symptoms or clinical depression (Van Vreeswijk & de Wilde, 2004; Williams, 1996), also in later life (Serrano, Latorre, & Gatz, 2007). A recent meta-analysis shows that overgeneralization in depression is particularly found with regard to positive memories (Ono, Devilly, & Shum, 2016). This finding matches earlier research on mood congruence effects that has shown that people in depressed mood recall fewer positive memories (Bower, 1981; Miranda & Kihlstrom, 2005; Singer & Salovey, 1988). To conclude, the competence to retrieve specific, positive memories is compromised by depressive symptomatology.

Research shows that this competence can be trained (Kremers, Spinhoven, Van der Does, & Van Dyck, 2006; Watkins, Teasdale, & Williams, 2000; Williams et al., 2000). Serrano, Latorre, Gatz, and Montanes (2004) developed a protocol, based on an existing life review intervention (Haight & Webster, 1995), to train the retrieval of specific positive memories in depressed older adults. In a randomized controlled trial, they found that the intervention showed larger effects on specific, positive memories and depressive symptoms than care as usual among older users of social services. Goncalves, Albuquerque, and Paul (2009) did a randomized study on the effects of the intervention among older visitors of day care centers. They also found significant effects on memory specificity and depressive symptoms. In a more recent study, Serrano et al. (2012) found significant differences in clinical depression, but not in memory specificity among older adults with clinical depression.

The present study extends previous research as it addresses whether the intervention is also effective when delivered by trained volunteers. The intervention is based on reminiscence as a naturally occurring process in later life (Westerhof, Bohlmeijer, & Webster, 2010). Volunteers can therefore easily stimulate this process in conversations about personal memories. Training in general counseling competences will aid volunteers in guiding the conversation. Following a well-defined protocol, volunteers learn how to stimulate the retrieval of specific, positive memories (Richters, Korte, Westerhof, & Bohlmeijer, 2015). There is no need for more professional therapeutic competences as in interventions that focus on evaluating memories or changing negative reminiscence styles (Westerhof et al., 2010).

An intervention that is volunteer-led has several advantages. Engaging volunteers fits current trends that ask for more societal involvement in care for older persons. For care institutes the delivery of the intervention will become more cost-effective and easier to organize than care provided by a professional psychologist (Richters, Schoonen, Korte, Bohlmeijer, & Westerhof, 2015). For older adults, an intervention delivered by a volunteer will be less stigmatizing than care by a psychologist, as volunteers provide a contact with society rather than with health care professionals (Westerhof, Maessen, de Bruijn, & Smets, 2008). It is well-known that volunteering supports both the volunteer's mental health and well-being and that of the people they serve (Wheeler, Gorey, & Greenblatt, 1998). The project suits both altruistic and self-oriented motivations of volunteers as it offers the possibility to add value to the lives of older adults, while also learning new competences in the training (Chen & Morrow-Howell, 2015; Hwang, Grabb, & Curtis, 2005).

Besides the delivery of the intervention by volunteers, the present study has some unique features in comparison to existing research (Goncalves et al., 2009; Serrano et al., 2004, 2012). First, the intervention targets older persons in residential care, a group that is especially at risk for depression (Seitz et al., 2010). Second, unlike earlier studies on the specific positive memory intervention, an active control condition is used that consisted of unstructured visits from a volunteer. This design allows controlling for the effects of social contact and personal attention. Third, a follow-up assessment was carried out that was missing in previous studies.

Our first expectation is that the intervention contributes more to the prevention and reduction of depressive symptoms than the active control condition, also at follow-up (Pinquart & Forstmeier, 2012). Our second expectation is that the intervention will be more effective for people with clinically relevant depressive symptoms, as this has also been found in the meta-analysis of Pinquart and Forstmeier (2012). Our third expectation is that the intervention increases specific positive memories as the working mechanism of the intervention (Serrano et al., 2004). Our fourth expectation is that the intervention also affects anxiety symptoms, loneliness, well-being, and mastery as secondary outcomes. Earlier studies showed that life review affects these outcomes as well (Pinquart & Forstmeier, 2012).

Methods

Design

A randomized controlled trial with two parallel conditions was used with depressive symptoms as the primary outcome. The

intervention condition received the intervention 'Precious Memories', whereas the control condition had individual unstructured contacts with a volunteer. Randomization was carried out after the baseline measurement, based on a computer-generated list of random numbers. There were three measurements: pre-intervention, post-intervention (2 months after the first measurement), and follow-up (8 months after the first measurement). Risks were minimized by excluding people with severe depression or at risk of suicide, and by instructing volunteers to refer an older person to appropriate care when depressive symptoms worsen (Richters et al., 2015).

Intervention condition

The intervention 'Precious memories' is adapted from the intervention that aims to increase specific positive memory retrieval developed by Serrano et al. (2004). Serrano's intervention focused on four themes in four weekly sessions that were guided by a psychologist: childhood, adolescence, adulthood, and summary. Fourteen questions (based on Haight & Webster, 1995) were used to elicit specific positive memories.

The protocol was translated and adapted to the Dutch context and an introductory session was added. The protocol is described in a manual that is adapted to volunteers who are not psychologists (Richters et al., 2015). The intervention consisted of five individual sessions of 45 min between a participant and a trained volunteer. The volunteers arranged with the participants that sessions took place weekly or biweekly in a period of eight weeks maximum. The first session was used to get acquainted and to orient the volunteer towards the general life story of the participant. This was important to have enough contextual information for the following sessions. The second session addresses specific positive memories in childhood (0-12 years), the third session in adolescence (12-18 years), the fourth in adulthood (18+ years). The last session covers the life story in general and includes a closing of the intervention. For each session there are fourteen questions that are used as prompts to elicit specific positive memories, such as 'when you were a child, did you have a friend you played with a lot; can you remember a nice moment of something you did together?'; 'do you remember a moment in adolescence when you were passionate about a book, film, or person when you were a teenager?'; 'is there a particular place that meant a lot to you when you were a young adult; which moment do you remember?'; 'during more recent years, did you make a trip or vacation that you will never forget?'.

Control condition

In the control condition, volunteers visited a participant five times across a maximum of eight weeks for about 45 min per week. Each time the volunteer decided together with the participant what he or she liked to do. The volunteers reported that they engaged in conversation, often about experiences of loss or physical complaints. Sometimes they reported that they played cards, went shopping, or, in a single case, visited a museum.

Volunteers

Volunteers were recruited in two Dutch care groups through professionals who coordinated the volunteer work.

Requirements for the volunteers were an educational level of at least middle professional education (15 or more years), interest in older persons, being socially competent and flexible, and having time to visit at least one participant. Additional requirements for those volunteers who delivered the intervention were being able to gain insight in the theoretical background of the intervention and willingness to follow the training. Requirements were checked in an intake session with the volunteer coordinator in the care group, based on self-reports of the volunteers.

Twenty-eight volunteers participated in the study. Their age was mostly between 60 and 70 years with a range of 24–84 years. Most volunteers were female ($n = 24$). There were no significant differences in age and gender between the volunteers in the control and intervention condition.

Due to practical reasons of timely matching volunteers to older adults, twelve volunteers participated in both conditions. Eight volunteers participated only in the intervention and eight only in the control condition. Based on availability of the volunteers, ten volunteers visited one participant, seven visited two participants, and eleven visited more than 2 participants, up to a maximum of 13.

Training of volunteers

The training for the intervention 'Precious Memories' is documented in a train-the-trainer manual (Richters et al., 2015). A licensed health care psychologist trained all volunteers who participated in the intervention condition. Volunteers who only participated in the control condition did not receive this training, but received a short instruction to familiarize them with the goal of the visits. The learning goals of the training are (1) gaining knowledge and insight in depressive symptoms and autobiographical memory in later life, (2) acquiring general counseling competences (listening, providing empathy, structuring, probing, dealing with private information, and referring to specialist care in case of complex problems) and (3) developing specific counseling competences directed at the retrieval of specific positive memories, such as probing for more specificity of positive memories, or acknowledging negative feelings before focusing on positive memories again.

The training consists of three elements with a total time investment of 12 h. First, a workbook provided relevant information on depression, reminiscence, autobiographical memory, counseling competences as well as the protocol of the intervention per session. Second, an online training tool was developed with short informational clips as well as exercises and questions. Third, there were two four-hour face-to-face sessions. During the sessions, the psychologist instructed the volunteers, but they could also pose questions, and practice their competences through role-playing. The psychologist checked successful completion of the training, and handed out a certificate to the volunteers.

Participants

Inclusion criteria were (1) living in a care facility, (2) being older than 60 years and (3) expressing their motivation to participate. Exclusion criteria were (1) severe cognitive impairment (MMSE score of 18 or lower; Folstein, Folstein, & McHugh, 1975), (2) a severe depressive episode (8 or 9 out of 9 possible indicators for depression on the MINI; Sheehan et al., 1998), (3) a risk of suicide (one of the questions in the

MINI module on depression; Sheehan et al., 1998), (4) having started antidepressant medication in the past three months, or (5) lack of command of the Dutch language.

The participants were on average 84.2 ($SD = 8.5$) years old, ranging from 60 to 98 years. The majority was female (62%), did not have a partner (86%), was living alone (89%), and had lower education (84% less than 11 years). The mean score for cognitive impairments (MMSE) was 25.7 ($SD = 3.2$). On average, participants needed help for 7.6 ($SD = 5.1$) out of 18 functional impairments.

Instruments

Demographic variables were assessed with questions on age, gender, marital status, living situation, and educational level. Functional impairments were measured with the 18-item Groningen Activity Restrictions Scale (Kempen & Suurmeijer, 1990; Cronbach alpha in this study = .94).

The primary outcome is depressive symptoms, measured with the Dutch version of the shortened Geriatric Depression Scale (GDS-8; Jongenelis et al., 2007). The GDS-8 has 8 items that can be answered with yes or no. Each item is scored with a 0 for no depressive symptoms or 1 for depressive symptoms. The sumscore ranges from 0 to 8; a score of 2 or higher is seen as an indication for clinically relevant symptoms. The scale has a Cronbach alpha of .75 in the current study.

The process variable is specific positive autobiographical memories. This is measured with a modified version of the Autobiographic Memory Test (AMT; Williams & Broadbent, 1986). Ten positive items (like happy, interested, calm) are used to assess the competence to retrieve specific positive memories. The interviewer mentions the cue word and asks the participant to react as quickly as possible. When no response is given after 30 s, the cue word is repeated. When no memory is produced after another 30 s, the code for 'no memory' is given. If a participant tells a general or repeating memory the interviewer prompts the participant to become more specific. When no specific memory is produced after 60 s, the code for 'general memory' is given. When a participant produces a specific memory of an event that happened on a particular day and place, the code for 'specific memory' is given. The number of specific positive memories across the 10 cue words is counted with a range from 0 to 10. The scale has a reliability of .72 (Cronbach alpha) in the current study.

Secondary outcome measures are anxiety, loneliness, well-being, and mastery. Anxiety is measured with the anxiety subscale of the Dutch version of the Hospital Depression and Anxiety Scale (HADS-A; Spinhoven, Ormel, Sloekers, & Kempen, 1997; Zigmond & Snaith, 1983). Seven items ask for symptoms of anxiety and are rated by the participant on a four-point scale from 'not at all' to 'very much'. A sumscore is computed across the seven items and ranges between 0 and 21. The Cronbach alpha in this study is .75.

Loneliness is measured with the Dutch Loneliness scale (de Jong-Gierveld & Kamphuis, 1985). Eleven items are scored on a five-point scale ranging from 'no!' to 'yes!'. Each item is dichotomized and the sumscore across the eleven items is calculated, resulting in a score between 0 and 11. In this study the Cronbach alpha is .82.

Well-being is measured with the Dutch Mental Health Continuum-Short Form (MHC-SF; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). The scale consists of 14 theoretically derived items that measure emotional, psychological,

and social well-being. Participants rate each feeling of well-being in the past month on a scale from 'not at all' to 'every day'. The mean score ranges from 1 to 6. The scale has a Cronbach alpha in the present study of .84.

Mastery is measured with the Dutch version of the Pearlin Mastery Scale (PMS; Pearlin & Schooler, 1978). The scale consists of five items that are rated on a 5-point scale from 'disagree completely' to 'agree completely'. The sumscore is calculated across the five items, resulting in a score that ranges between 5 and 25. The Cronbach alpha is .69 in this study.

Procedure

Participants were recruited between April 2014 and May 2015 among older persons who received care from two Dutch care groups. The researchers who carried out the study (JK & SE) explained the study and its inclusion criteria to nurses who were primarily responsible for the care of possible participants. The nurses identified possible participants, discussed their participation in the study, and provided written information about the study. The nurses reported names of possible participants to the researchers.

The researchers sent a third-year Bachelor student or a Master student in Psychology to the possible participant for an intake conversation. The main researcher (JK) trained these students for half a day to administer the questionnaires. The students explained the goal of the study and asked the participant again whether he or she wanted to participate. When the participant agreed, he or she signed an informed consent form. Next, the inclusion and exclusion criteria were checked: a question was asked whether the participant started antidepressant medication during the past three months; a short diagnostic interview (MINI; Sheehan et al., 1998) was conducted to exclude participants with a major depressive episode (8 or 9 of the possible 9 symptoms) or suicide risk; the Mini Mental State Examination (MMSE) was used to exclude persons with cognitive impairments (score of 18 or lower; Folstein et al., 1975). Last, all study variables were measured, including demographic variables, functional impairment as well as all outcome and process variables.

The questionnaires were handed back for a final check on the inclusion by the researchers (JK & SE). After inclusion, they carried out the randomization and matched volunteers and participants on the basis of availability. They informed the nurse about the results and the nurse arranged a first session between the participant and volunteer. The volunteer visited the participant five times, either giving the intervention or unstructured visits. After that, trained third year Bachelor students and Master students carried out the post-intervention measurement (two months after the first measurement) and the follow-up (eight months after the first measurement), again under supervision of the researchers.

Analyses

A power analysis (using G*Power) revealed that 134 participants were needed, based on a t-test with a power of .80, an effect size of .50, a one-sided alpha of .05 and 25% drop out between the first and last measurement. We based the effect size on the meta-analysis of Bohlmeijer et al. (2003) that included only randomized controlled trials on life review interventions. They found an effect size (Cohen's d) of .84 on

depressive symptomatology. As our study used an active control condition, we expected a lower effect.

Descriptive statistics were used to describe the demographic characteristics and cognitive and functional impairments of the participants. Chi-square tests and t-tests were used to check the randomization, i.e. whether the intervention and control condition differed in demographical variables, cognitive and functional impairments, and psychological characteristics at pre-intervention. A stepwise logistic regression analysis was used to assess whether demographic variables, functional impairments and psychological characteristics predicted drop out of the study. Missing values for the outcome scales were completely at random (Little's MCAR test with $\chi^2(47) = 34.2$; $p = .919$) and imputed using the expectation maximization method in SPSS Missing Values Analysis. Repeated measures MANOVAs were used to assess the expectations concerning the differences between conditions in primary, process, and secondary outcomes across time. The condition (intervention vs. control) was the independent variable and each outcome measure across the three measurements was the repeated dependent variable. Simple contrasts were used post-hoc to compare the post-intervention and follow-up measures with the pre-intervention measures. To assess the second expectation, the presence of clinically relevant depressive symptoms ($GDS-8 > 2$; Jongenelis et al., 2007) was added as a moderator to the repeated measures MANOVA. Effect sizes at post-intervention and follow-up were calculated as Cohen's d. Effect sizes between .56 and 1.2 were interpreted as large, between .33 and .55 as moderate, and below .33 as small (Lipsey et al., 1993). All analyses were done on the intention-to-treat (ITT) sample and on completers only. The ITT analyses are reported, but it is noted in the results section when there were different outcomes for the completers only.

Results

Preliminary analyses

Figure 1 shows the flow of participants. 306 persons were approached of whom 81 (26%) participated in the study. This is less than expected (81 instead of 134 participants). Possible participants often reported a lack of motivation to participate when they were approached. Twenty-three participants discontinued the intervention, about equally distributed across both conditions. Three participants discontinued the intervention because they were not motivated and three because they had an abundance of negative memories. Six participants in the control condition discontinued the contacts, because they had a lack of motivation. The drop out of the study was higher than expected (37% at follow-up instead of the expected 25%).

A randomization check showed that no significant differences existed between the intervention and control condition on the demographic characteristics as well as cognitive and functional impairments (chi-square tests and t-tests with $p > .05$). T-tests showed that there were also no significant differences (all $p > .05$) on most psychological characteristics before the intervention: depressive symptoms, anxiety, loneliness, well-being, and mastery. The only exception is the number of specific positive memories ($t(79) = 2.1$; $p = .038$): the control condition started at a higher level (mean = 4.2. sd = 2.5) than the

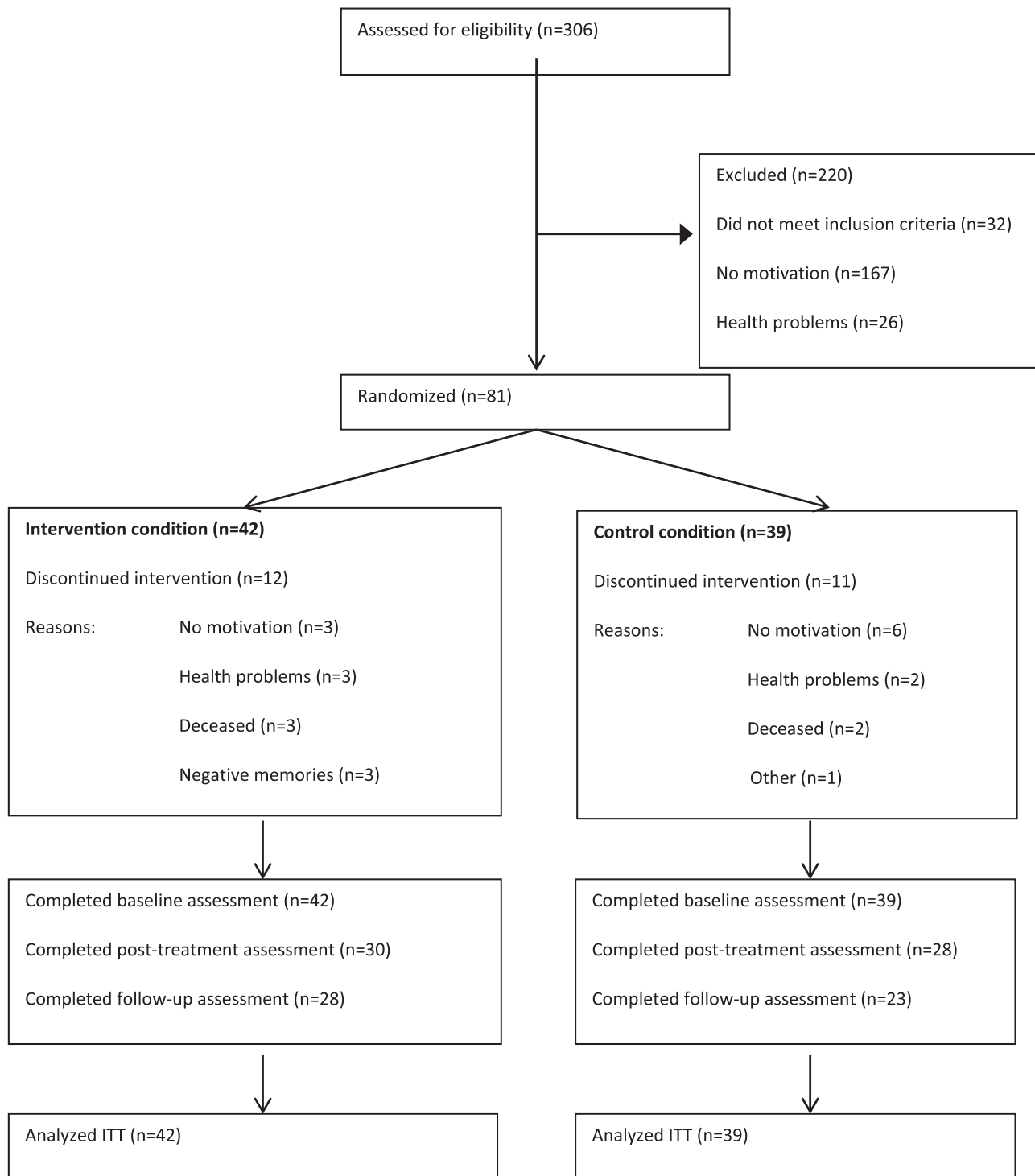


Figure 1. Flow participants.

intervention condition (mean = 3.1; sd = 2.1). In the control condition there were 17 and in the intervention condition 19 participants with clinically relevant depressive symptoms (score of 2 or higher on the GDS; $\chi^2(1) = .02$; $p = .881$).

No significant difference existed in drop-out at follow-up between the intervention and control condition ($\chi^2(1) = 0.5$; $p = .474$). A stepwise logistic regression analysis with drop-out at follow-up (0 = no; 1 = yes) as dependent variable and condition, demographic variables, cognitive impairments, functional impairments, and psychological characteristics at pre-intervention as independent variables showed no significant predictors of drop-out. Hence, there were no systematic

differences between participants at follow-up and those who dropped out.

Hypothesis testing

Our first expectation was that the intervention contributes to the prevention and reduction of depressive symptoms, more than the active control condition, and also at follow-up. The results of the repeated measures MANOVAs can be found in Table 1. There is a significant difference in the primary outcome depressive symptoms across time. In both conditions, the depressive symptoms decline at post-intervention, but increase again at follow-up. The within-subject contrasts

Table 1. Changes in outcome measures (intention to treat analyses; $N = 81$).

| | | Pre Intervention | | Post Intervention | | Follow-up | | Time | Time* Condition | Condition |
|----------------------------|--------------|------------------|------|-------------------|------|-----------|------|--------------|-----------------|--------------|
| | | Mean | SD | Mean | SD | Mean | SD | $F_{(2,78)}$ | $F_{(2,78)}$ | $F_{(1,79)}$ |
| Depressive symptoms | Control | 1.5 | 1.9 | 1.1 | 1.5 | 1.3 | 1.8 | 4.0* | 0.2 | 1.3 |
| | Intervention | 1.7 | 2.2 | 1.4 | 2.0 | 1.6 | 2.2 | | | |
| Specific positive memories | Control | 4.2 | 2.5 | 3.6 | 1.7 | 3.7 | 1.8 | 0.8 | 6.0* | 0.8 |
| | Intervention | 3.1 | 2.1 | 4.1 | 1.9 | 3.4 | 1.7 | | | |
| Anxiety symptoms | Control | 4.3 | 4.8 | 3.6 | 4.5 | 2.3 | 2.8 | 24.0* | 0.4 | 1.2 |
| | Intervention | 3.3 | 4.3 | 2.4 | 3.3 | 2.0 | 2.8 | | | |
| Loneliness | Control | 4.4 | 5.2 | 4.0 | 3.8 | 3.4 | 3.9 | 6.5* | 2.3 | 0.6 |
| | Intervention | 3.2 | 2.7 | 3.0 | 2.4 | 2.4 | 3.1 | | | |
| Well-being | Control | 4.1 | 4.0 | 4.1 | 4.2 | 4.2 | 4.0 | 0.9 | 2.6 | 0.2 |
| | Intervention | 0.9 | 1.0 | 0.8 | 0.8 | 0.8 | 0.9 | | | |
| Mastery | Control | 14.8 | 15.0 | 15.6 | 15.7 | 15.0 | 15.4 | 1.4 | 0.1 | 0.1 |
| | Intervention | 4.1 | 4.6 | 3.4 | 3.7 | 3.1 | 3.1 | | | |

* $p < .05$

show that the improvement for both conditions at post-intervention is significant ($F_{(1,79)} = 5.7$; $p = .020$), but that the difference between pre-intervention and follow-up is no longer significantly different ($F_{(1,84)} = 1.1$; $p = .295$). The effects are small (Cohen's d is .22 at post-intervention and .09 at follow-up).

To assess the second expectation about differences according to level of depressive symptoms, we added the presence of clinically relevant depressive symptoms as a moderator to the repeated measures MANOVA. We found a significant interaction between the presence of clinically relevant depressive symptoms and time ($F_{(2,76)} = 5.0$; $p = .009$). There are no further significant interactions, so this finding is independent of the intervention or control condition. Those without clinically relevant symptoms showed no change (means respectively 0.3, 0.4, and 0.5; standard deviations 0.5, 0.8, 1.0). Those with clinically relevant symptoms showed a decrease in depressive symptoms (means respectively 3.5, 2.5, and 2.9; standard deviations 1.7, 1.9, and 2.0). The changes for those with clinically relevant depressive symptoms are moderate at post-intervention (Cohen's $d = .56$) and at follow-up (Cohen's $d = .33$). We also tentatively used cognitive impairment (MMSE score with a cut-off of 24) as a moderator, but found no differences between more or less impaired persons in their changes in depressive symptoms.

Our third expectation was that there would be a stronger increase in specific positive memories in the intervention than the control condition. The results for specific positive memories indeed show a significant interaction between condition and time. The intervention condition improves in specific positive memories, whereas the control condition decreases somewhat. The within-subjects effects show that the effect is significant at post-intervention ($F_{(1,79)} = 12.2$; $p = .001$), but not at follow-up ($F_{(1,79)} = 2.2$; $p = .146$). The difference in Cohen's d between the two conditions shows moderate effects at post-intervention (.77) and at follow-up (.38).

Besides depressive symptoms, we expected that the intervention contributes to anxiety symptoms, loneliness, well-being, and mastery. These secondary outcomes show a significant time effect on anxiety and loneliness for both conditions. There are no significant effects on well-being or mastery. For anxiety, the within-subjects contrasts show no significant effect at post-intervention ($F_{(1,79)} = 1.7$; $p = .202$), but a significant effect at follow-up ($F_{(1,79)} = 37.2$; $p < .001$). The effect at follow-up is moderate (Cohen's $d = .62$). Loneliness decreases in both conditions with significant within-subject contrasts at post-intervention ($F_{(1,79)} = 7.4$; $p = .008$) and follow-up ($F_{(1,79)} = 13.0$; $p = .001$). Cohen's d shows that these

effects are small at post-intervention (Cohen's $d = .32$) and moderate at follow-up (Cohen's $d = .41$). The analysis with completers only showed a significant interaction effect for loneliness ($F_{(2,45)} = 5.8$; $p = .006$) that was not found in the intention-to-treat analysis. Participants in the intervention condition showed more decline in loneliness than participants in the control condition at post-treatment, but not at follow-up.

Conclusion

The current study extended previous research on an autobiographical memory intervention that trains the competence to retrieve specific, positive memories (Goncalves et al., 2009; Serrano et al., 2004, 2012). Trained volunteers delivered the intervention to a group at risk of depression: older adults who live in residential care homes. The study expanded earlier research as it used an active control condition as well as a follow-up assessment. Our first and second expectations were not confirmed: depressive symptoms improved equally well in both conditions. In both conditions, those without clinically relevant depressive symptoms maintained their low level of depressive symptoms, whereas those with clinically relevant depressive symptoms improved during the intervention and at follow-up. The third expectation on the process measure was partly confirmed: the retrieval of specific positive memories was improved more in the autobiographical memory intervention, although this was not maintained at follow-up. The last expectation for the secondary outcomes was not confirmed: anxiety and loneliness improved equally in both conditions and no effects were found for well-being or mastery.

Our study is unique in that volunteers delivered the intervention. Both the intervention and the unstructured contact with volunteers seem to have contributed to a reduction in symptoms of depression, anxiety, and loneliness. These findings match earlier research that volunteering contributes to the mental health of those who are served (Wheeler et al., 1998). The findings are even more remarkable, as a systematic review concluded that depressive symptoms tend to be chronic and persistent in nursing homes (Seitz et al., 2010) and another review concluded that it is hard to change loneliness in older adults (De Jong-Gierveld, Fokkema, & Tilburg, 2011). This suggests that indeed the volunteer contact is related to a decrease in symptoms and that these should not be attributed to normal fluctuations in symptomatology.

Our study is the first that used an active control condition to control for social contact and attention. There may be some reasons why the intervention did not result in a

stronger decrease in symptoms than the control condition. Volunteers in both conditions were selected according to similar criteria: socially competent volunteers with an interest in older adults visited both groups. The majority of the volunteers only saw one or two participants in the intervention condition so that they did not gain much experience in delivering the intervention. Furthermore, there might be a contamination effect as some volunteers served in both conditions. This contamination effect is contradicted, however, by the finding that the competence to retrieve specific, positive memories increased more in the intervention than the control condition. A post-hoc coding of transcriptions of the five sessions of four randomly chosen volunteers showed that on average 4.25 positive memories were retrieved per session. This finding also illustrates that the volunteers were successful in stimulating specific, positive memories. However, volunteers in the control condition reported to have discussed life problems such as loss of loved ones or illness and occasionally also discussed memories with the participants. This might also have contributed to mental health. Hence, we conclude that there is a need for further research addressing the specific processes by which volunteer contact might contribute to mental health.

Another feature of our study is that we also assessed effects at follow-up. This resulted in a rather differentiated pattern of findings. The improvement in depressive symptoms persisted only at follow-up for older persons with clinically relevant depressive symptoms. The effects on autobiographical memory were no longer significant at follow-up, whereas anxiety and loneliness were improved in both conditions at follow-up. These findings suggest that the intervention might be better targeted at persons with depressive symptomatology. Furthermore, the intervention needs to be strengthened to maintain the effects on retrieving specific positive memories for a longer time. This could be done by adding sessions to the intervention to achieve a higher impact and by using other and more tangible prompts like photos, objects or sounds, to support the elicitation of specific positive memories. Furthermore, one might think of keeping the memories that were retrieved in a life-story book, so that they can be more easily retrieved over and over again. Family members or nurses could use the book to support participants in retrieving the memories. A less time consuming way might be that the volunteer records the questions that were successful in retrieving specific positive memories. Family, friends, and/or staff could use these questions to repeatedly elicit specific positive memories over a longer period of time.

The finding that changes in depressive, anxiety, and loneliness complaints are not mirrored in well-being and mastery matches the findings of the meta-analysis by Pinquart and Forstmeier (2012) who also found smaller effects of reminiscence and life review on well-being than on depressive symptoms. The finding also fits evidence that the absence of complaints does not automatically imply the presence of positive functioning (Keyes, 2005; Lamers, Westerhof, Glas, & Bohlmeijer, 2015). Future research should therefore also address how the retrieval of specific, positive memories can enhance positive functioning in vulnerable older adults.

It was difficult to engage older persons in residential care to take part in the study, and the drop-out was also larger than expected. The lack of motivation to participate might be related to the fact that this was a scientific study and not just an intervention. Some people mentioned that they already

participated in another study that was conducted at the time. Although this might have inflated the power of the study, we were able to detect an interaction effect for specific, positive memories. Drop-out could not be predicted by the demographic characteristics, cognitive and functional impairments or psychological characteristics. The results between the completers only and intention to treat analyses were also very similar. Hence, the findings on the changes in both conditions appear to be valid.

To conclude, the present study provides mixed findings on the effects of the autobiographical memory intervention as delivered by trained volunteers in a population at risk. The competence to retrieve specific positive memories can be trained, but the effect appears to be short-term. Effects are found for depressive, anxiety, and loneliness complaints in both kinds of volunteer contact, suggesting that simple visits can have positive effects for older persons in residential care. Our study also suggests that volunteers can successfully deliver the Precious Memories intervention and contribute to the mental health of this vulnerable group of older adults.

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ORCID

Gerben J. Westerhof  <http://orcid.org/0000-0002-0993-1448>
Ernst T. Bohlmeijer  <http://orcid.org/0000-0002-7861-1245>

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