

***Reminiscence therapy
with life story books for
people with dementia:***

A systematic review

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Table of contents

Introduction	4
- Dementia	4
- Interventions	4
- Reminiscence therapy	4
- Effects of reminiscence therapy	5
- Life review process	5
- Life story book	6
- Aim of the study	6
Method	7
- Inclusion criteria	7
- Data sources and search strategy	7
- Data extraction	8
Results	9
- Research question 1	15
- Type of life story book	15
- Target group	16
- Performance of the intervention and number of sessions	17
- Research question 2	19
- The aim of the study	19
- Type of study	20
- Sample size	21
- Measures	21
- Effects	22
Discussion	24
- Aim of the study	24
- The use and effects of life story books	24
- Strengths and limitations	27
- Implications for future practice	28
References	30

Abstract

Background: Previous studies have proven the beneficial value of reminiscence therapy. Reminiscence therapy is effective for people with dementia in improving cognitive function and decreasing depressive emotions. Life story books are used to help people with dementia retrieve autobiographical memories easier. However, little is known about how to use life story books successfully in an intervention and the possible effects of life story books. Therefore, further research is necessary and this systematic review aims to determine the possible effects life story books can have on people with dementia and how to successfully use life story books in an intervention.

Method: Three scientific search engines (Pubmed, Scopus & PSycINFO) were used to find articles which described interventions with life story books for people with dementia. These articles had to include the terms of life story books such as, life album, life story book, autobiography book, memory book, biography book, life history book. The articles also had to include the terms dementia, Alzheimer and MCI. In total, 99 studies were selected. A study could only be included if it was empirical, reporting on life story books and published in English. Another criteria for inclusion was that the participants had to be people with dementia. Only peer-reviewed articles published in English were eligible for the systematic review. A total of six articles were identified through other sources by both reviewers. The screening process led to a total of 13 articles. The studies were assessed according to nine pre-determined criteria.

Results: Interventions with life story books were most successful when; people with mild to moderate dementia were recruited, care givers were involved, participants provided the necessary materials, the participants were involved with the life review process and sessions occurred on a weekly basis. Life story books were associated with an improvement in autobiographical memory and higher levels of well-being. Joint life story books strengthened the identity of couples and improved their communication. Life story books can also cause feelings of sadness because participants are reminded of their losses. Life story books have the potential to delay the institutionalization of people with dementia.

Conclusion: The results from previous studies were underlined in this systematic review. A life story book is an effective and multifaceted tool with much potential for people with dementia.

Samenvatting

Achtergrond: Voorgaande studies hebben het de voordelen van reminiscentie therapie bewezen. Reminiscentie therapie is effectief in het bevorderen van cognitieve functies en het tegengaan van depressieve gevoelens. Levensboeken maken het ophalen autobiografische herinneringen makkelijker. Er is echter weinig bekend over hoe levensboeken het beste kunnen worden ingezet en wat de effecten van levensboeken zijn. Er is meer onderzoek nodig naar dit onderwerp. Deze literatuur is gericht op het vaststellen van hoe levensboeken het beste kunnen worden ingezet en wat de mogelijke effecten van levensboeken zijn,

Methode: Met behulp van drie wetenschappelijke zoekmachines (Pubmed, Scopus & PSycINFO) werden artikelen gezocht die te maken hadden met de constructen ‘levensboeken’ waaronder levensalbum, levensboek, autobiografie boek, geheugen boek, biografieboek en levensgeschiedenis boek. Er werd ook gezocht naar de constructen die te maken hadden met ‘dementie’, waaronder dementie, Alzheimer en MCI. In totaal werden er 99 artikelen gevonden. Een artikel werd alleen toegevoegd als het een empirische onderzoek was, levensboeken deel uitmaakte van de interventie en het in het Engels was gepubliceerd. De artikelen moesten ook peer-reviewed zijn. Dit proces leidde naar een totaal van veertien artikelen. Een artikel was later alsnog uitgesloten omdat levensboeken niet werden gebruikt in de interventie. De artikelen werden beoordeeld op basis van negen vastgestelde criteria.

Resultaten: Interventies met levensboeken waren het meest succesvol met; deelnemers met milde tot gemiddelde dementie, betrokken zorgverleners, deelnemers die de benodigde materialen beschikbaar stellen, deelnemers die deelnemen aan het proces van levensherziening en wekelijkse sessies. De resultaten van voorgaande studies komen overeen met de resultaten uit dit literatuuronderzoek. Levensboeken werden geassocieerd met hogere niveaus van welzijn en verbeteringen in de autobiografische geheugen. Gedeelde levensboeken versterken de identiteit van koppels en verbeterd hun onderlinge communicatie. Levensboeken kunnen ook verdrietige gevoelens oproepen omdat de deelnemers denken aan de verliezen die ze hebben geleden. Levensboeken hebben de potentie om opnames in verzorgingstehuizen uit te stellen.

Conclusie: Een levensboek is een effectief en veelzijdig instrument met veel potentie voor mensen met dementia.

Introduction

Dementia

Dementia is a progressive disease that causes depressive symptoms and the deterioration of cognitive functions (Huang et al., 2015). Dementia is a syndrome characterized by causing psychological, cognitive and behavioural changes (McKeith & Cummings, 2005). According to Haight, Gibson and Michel (2006), dementia can be described as a syndrome that gradually grows worse and is associated with diminishing memory, social functioning, communication and the ability to perform daily activities. People with dementia are therefore affected in their ability to still live independently. The severe consequences of this syndrome befall the people with dementia, the people that care for them, their relatives and the community (McKeith & Cummings, 2005). McKeith and Cummings (2005) stated that many people with dementia in care homes also have behavioural problems. Nowadays, due to advances in technology, people live longer. The world population is aging and this process is aided by the improvement of the life expectancy (Chiang et al., 2010). Ingersoll-Dayton, Spencer, Campbell, Kurokawa and Ito (2016) stated that more than 35 million people in the world have dementia and that this number is increasing at an alarming rate. Due to this expected increase, the cost of care for people with dementia will also increase (Boots, de Vugt, van Knippenberg and Kempen, 2014).

Interventions

Medical treatment with drugs was regarded as the favoured treatment for the symptoms of dementia. Several studies have shown that the usage of these drugs can cause unwanted side effects. Therefore it is essential to examine therapies without drugs for people with dementia (Huang et al., 2015). According to Cotelli, Manenti and Zanetti (2012) the limitations of treatments with drugs contributed to the increasing exploration of interventions without drugs. Psychosocial interventions such as reminiscence in particular, are very promising for people with dementia. According to Subramaniam & Woods (2012) reminiscence work has been studied for almost 30 years and reminiscence therapy is the favoured psychosocial intervention for people with dementia.

Reminiscence therapy

Reminiscence therapy usually involves discussing the past of a person while using personal memorabilia and pictures (Subramaniam & Woods, 2012). Chung (2009) stated that reminiscence focused on autobiographical memories because these memories remain relatively preserved during the early stages of dementia. Reminiscence therapy shows promising effects on autobiographical memory and it can be applied to an individual and a

group (Subramaniam & Woods, 2012). Huang et al. (2015) argues that reminiscence therapy can be easily administered by professionals in a range of situations and that the people with dementia are continuously engaged because they are utilizing their own memories. According to Subramaniam and Woods (2012) reminiscence therapy for individuals focuses on the life story of an individual. Chung (2009) stated that reminiscence therapy for people with dementia is usually administered by health care professionals. According to Chin (2007) reminiscence therapy is associated with numerous beneficial effects for people with dementia such as the preservation of their self-esteem and the improvement of their sense of self.

Effects of reminiscence therapy

The findings of a systematic review suggested that reminiscence therapy is associated with major psychosocial benefits for people with dementia. These findings showed that reminiscence therapy was associated with improved well-being, mood, memory, social interaction, self-esteem and cognitive functions (Subramaniam & Woods, 2012). A meta-analysis showed that reminiscence therapy effected cognitive functions and depressive symptoms of people with dementia. This study also showed that reminiscence therapy is more effective for people with dementia that are institutionalized (Huang, et al., 2015). These findings show the potential benefits for wide spread usage of reminiscence therapy among institutionalized people with dementia. Subramaniam and Woods (2012) suggested that the benefits of reminiscence therapy affect people with dementia, their relatives and their care givers. Therefore by extension, reminiscence therapy can affect family members and care givers. This study also showed that reminiscence therapy that incorporates a life review process and results in the production of a life story book shows great potential. Reminiscence therapy that focuses on developing a life story book was associated with preserving autobiographical memory (Subramaniam & Woods, 2012).

Life review process

Haight et al. (2003) stated that a life review process can be described as a structured intervention that utilizes reminiscence and focuses on the history of an individual. This study emphasized the role of personal history and its relevance for people with dementia. The life review process is an intervention that encourages people with dementia to talk about their life and assist the person organizing their life story book (Haight, Gibson & Michel, 2006). Haight et al. (2003) stated that the life review process is structured and focuses more on the evaluation of people with dementia compared to regular reminiscence work. According to Haight et al. (2006) the process of life review is much more demanding for people with

dementia compared to regular reminiscence work. Therefore it can be difficult for people with dementia to complete the intervention. The findings of a randomized controlled trial showed that a life review process was associated with improved autobiographical memory. This study showed great potential for life review interventions resulting in the development of a life story book for institutionalized people with dementia (Subramaniam, Woods & Whitaker, 2014).

Life story book

A life story book is the result of a life review process and it is described as a book that depicts the history of an individual, in chronological order, with pictures, captions and personal memorabilia (Haight, et al., 2003; Subramaniam, Woods & Whitaker, 2014). Life story books were first developed for children in foster care. Life story books aided the stability of their identity through continuous changes (Haight, et al., 2006). According to Haight et al. (2003), a life story book should only contain items that are approved by the individual it is meant for. According to Subramaniam and Woods (2012), it would be normal in five years for people with dementia to have a digital life story book with their favourite music, pictures and videos. Subramaniam and Woods (2016) stated that digital life story books, compared to regular life story books, show additional benefits because of the range of possibilities such as music and video. This study displays the continuous improvement of life story books. However, further research is essential to explore the potential and possible effectiveness of life story books (Subramaniam & Woods, 2012).

Aim of the study

In summary, reminiscence therapy with the use of life story books has great potential as intervention for people with dementia. However, studies concerning life story books are scarce. Further research is crucial to examine the use of life story books. This systematic review focuses on reminiscence therapy with the use of life story books. By examining previous studies in which life story books have been applied, this review aims to display the possible effectiveness of this method and to determine the best way of using this method. The following research questions are addressed in this study:

- 1 – How are life story books used in interventions for people with dementia?
- 2 – What are the effects of reminiscence therapy with the use of life story books?

Method

The systematic literature review was conducted according to a specified protocol, and all measures of reporting and assessment were performed by following the Preferred Reporting Items for Systematic Reviews and Meta-analyses statement (PRISMA).

Inclusion criteria

A study could only be included if it was empirical, reporting on life story books and performed for people with dementia. Only empirical studies published in English were considered eligible for the systematic review. Hits that were a thesis, a chapter of a book and not published were also excluded

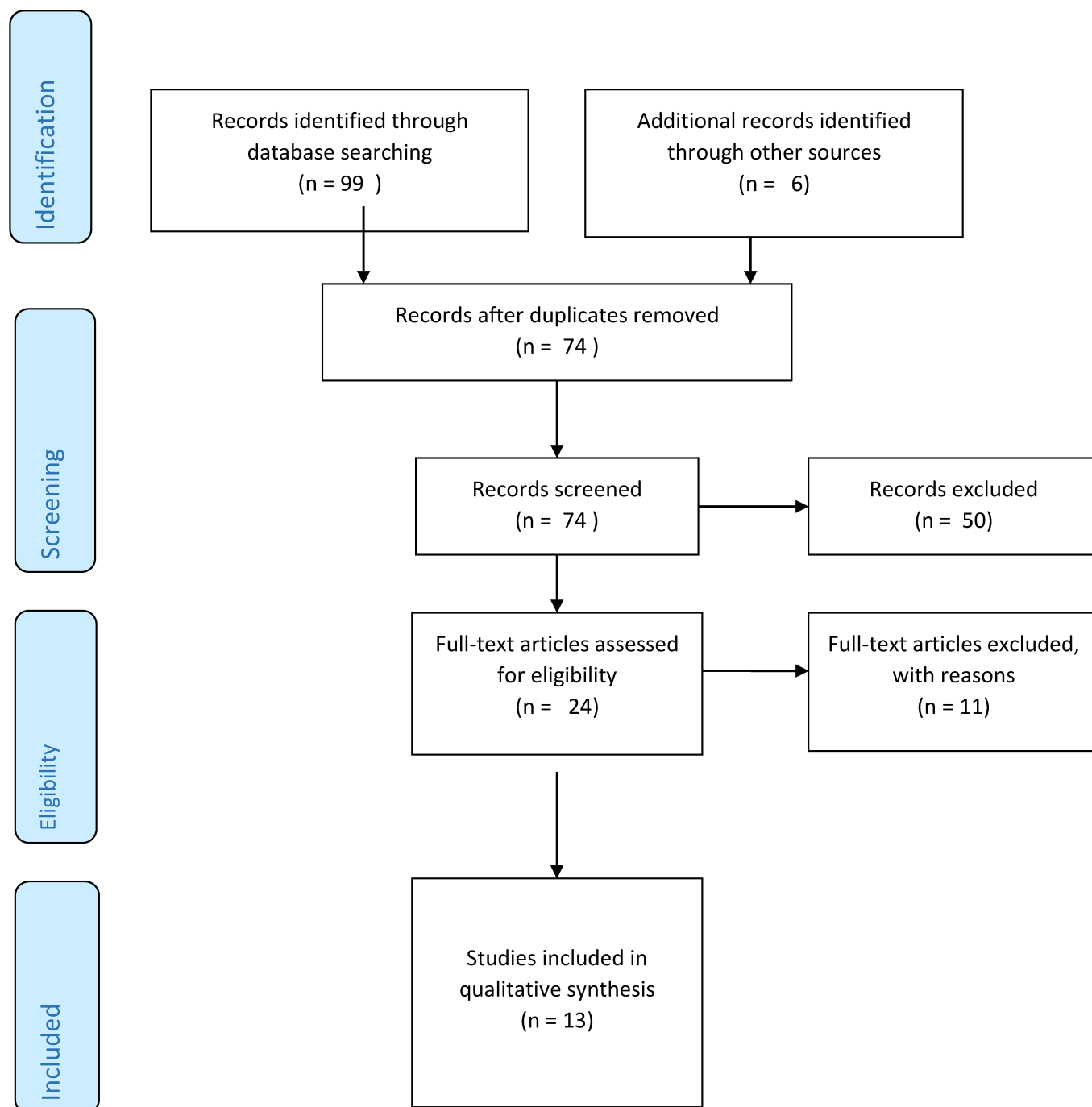
Data sources and search strategy

The following three databases were used, from inception to November, 6 2016: PubMed, PsycINFO and Scopus. A systematic search of empirical studies reporting on life story books for people with dementia was conducted. The reference lists of the identified studies were also checked to include all relevant studies. The following search string was inserted in each aforementioned databases: (TITLE-ABS-KEY("life album" or "life story book" or "autobiography book" or "memory book" or "biography book" or "life history book") AND TITLE-ABS-KEY (dementia or alzheimer or mci). All relevant studies were hand- searched using this search strategy. Two independent reviewers screened the results on basis of the titles and abstracts. Then the full texts of these eligible studies were reviewed, retrieved and appropriately evaluated in the systematic review. The initial search of all the databases generated 99 references. Each reference was reviewed by both reviewers to ascertain whether the study met the inclusion criteria. After removing 32 duplicate studies, both reviewers concluded that there were 21 eligible studies after the initial review based on the titles and abstracts. The remaining studies were excluded. Kappa (Inter rater-reliability) after the first round of exclusion was 0.93. Both reviewers searched for relevant articles through other sources separately. Six additional records were identified through other sources. In total, three articles including the 21 selected articles were examined on full text. The inter rater-reliability after the second round was 0.95. A disagreement occurred regarding the exclusion of an article. A consensus was reached to include the article. Thirteen studies remained after excluding studies in which life story books were not used and studies that were unavailable as a full text article. Another article was excluded later because life story books were not used in the intervention. The process of selecting the articles is represented in the flowchart in figure 1.

Data extraction

The results of the thirteen articles are represented in a table. The articles were analyzed with the following factors; type of life story book, target group, performance of the intervention and the number of sessions. These factors pertain to first research question. The following factors pertain to the second research question: aim of the study, type of study, sample size, measures and effects of the study.

Figure 1. Flow chart of the process of selecting the studies



Results

Tables 1 and 2 present the results from the systematic review of the final thirteen articles. Table 1 summarizes how life story books were used in the studies reviewed and table 2 summarizes the effects of life story books used in the studies reviewed.

Table 1. *Summary of how life story books were used in the studies reviewed*

Author	Type of Life Story Book	Target group	Performance of the intervention	Number of sessions
Crook et al. (2016)	Life story book and rummage box consisting out of photographs and personal memorabilia	The participants were people with Down syndrome and dementia	The researcher creates the life story books and rummage boxes.	Nine sessions during daytime, each session lasted 30 minutes.
Subramaniam et al. (2014)	Life review group was involved while making the LSB during the 12 sessions while the other group received it as a gift	People with mild to moderate dementia	Participants created their life story books with the researcher in the life review group.	Life review group: 12 individual sessions Both groups receive LSB 12 th week: 1 st assessment 18 th week : 2 nd assessment
Ingersoll-Dayton et al. (2016)	LSB created by practitioner with photos and memorabilia provided by the couple	People with mild to moderate dementia	Researcher compiles the life story book with materials from the couples.	5 week intervention with weekly sessions
Mckeown et al. (2013)	Three participants had life story books with pictures and one participant had a pen picture.	People with dementia at different stages of the condition.	An individualized approach was used for each participant for creating the life story book. A Multi-professional staff was involved in the study.	Each participant had a interview and a follow-up.
Scherrer et al. (2014)	The project culminates the creation of a life story book that utilizes couple's memento's (photographs, cards, news items) to document the story of their life together.	20 couples Average age care recipients: 74 Average age care giver: 72	A social worker compiles the life story books using mementos provided by the couples.	The Couples life story project is a 5 week structured dyadic intervention. A social worker visited the couple weekly, usually in their home
Spilkin et al. (2003)	The individualized memory book contained pictures of his family, hobbies and interests as well as grammatically simple questions that elaborated on the pictures	An 85 year old man who had been diagnosed with Alzheimer's disease.	The individualized memory book was created by the researcher and was given to the care giver of the participant.	Two baseline 10 minutes interactions between participant and the care giver followed by the intervention. The follow-up is a week later, and is another 10 minute interaction.

Chang et al. 2012	The memory books used in this study were constructed by the experimenter and consisted of three topics, daily life, myself and my family. Each topic contained 10 pictures with printed captions.	Three monolingual mandarin Chinese speakers. All were diagnosed with dementia by their psychiatric.	The memory books were produced by the researcher with materials provided by the relatives of the participants. A 2 nd observer was present	Baseline Sessions with memory books(5 min conversations about 3 topics Follow up It is a 5 week intervention with 1 hour sessions every week during this period. The average time span was 76 minutes (40-120 minutes)
Ingersoll-Dayton et al. (2013)	The life story book is constructed by social workers with the ‘‘homework’’ (taking pictures with them) for the couple.	Individuals who have dementia along with their spouses or partners. 24 couples (20 couples completed) Mean age care giver = 73.3 Mean age care recipient = 75.7	Social workers conduct the couples life story approach	
Abu Hashim et al. (2015)	This life story book is a digitized multi-functional life story book that consists of: daily routine reminders, photographs and games	Individual with mild to moderate dementia. A 74 year old woman with Alzheimer’s Disease	The researcher gives the digital life story book to the participant and also explains it. All sessions were handled by the caretaker	First the patient tests the application (30-45 minutes) A weekly sessions for the period of 8 weeks (15-30 minutes) 4 sessions in 4 weeks
Hashim et al. (2013)	A personalized memory book that includes personal info of the patient and family, multimedia application for performing prayer	A 67 year old woman (Early stage Alzheimer’s disease)	The life story book is introduced in the first session by the researcher. The caretaker does the remaining sessions	The first session took almost an hour and was performed by the researcher.
Haight et al. (2006)	The life story book contained photographs and explanatory captions	People mild to moderate dementia living in a assisted living facility	The care staff and the participants worked together to create the life story book, using the perspective of the participants	Intervention lasts 8 hours. Week 1 & 8 were about consent and pre and post tests and week 2-6 was life-review
Haight et al. (2003)	The life story book is an outcome of the life review process. The life story book is created by the patient, using the patient’s choice of pictures, props and words.	22 dyads (People with dementia and their care giver) All cared for at home)	Either the participant and the care giver worked on the life story book separately or only the care giver worked on it. Family members, care givers and reviewers were all involved in the intervention	The process takes 8 weeks (1hour visit per week)
Subramaniam et al. (2016)	A digitized life story book turned into a life story movie	People with dementia who where participants in a previous study about life story book	The participants were actively involved with the researcher acting as a co-editor. Researchers, care givers and family members were involved in the intervention	First session with the life story book 4 weeks complete Number of questionnaires

Table 2. *Summary of the effects of life story books used in the studies reviewed*

Author	Aim of the study	Type of study	Sample size	Measures	Effects
Crook et al. (2016)	This study focused on enhancing well being and changing behaviour	Randomized single case series design	N= 5	- Dementia Care Mapping (observational tool)	The results indicated that life story books and rummage boxes enhanced the well being of the participants
Subramaniam et al. (2014)	This study focused on comparing the two different ways to develop a life story book	A randomized controlled trial	N= 23	- CDR - QOL-AD - AMI-E - GDS-12R - QCPR - ADQ - Staff knowledge of care recipient questionnaire Interviews with a structural life review approach.	The results indicated that a life review process resulting in a life story book was associated with improved autobiographical memory, staff knowledge and attitude
Ingersoll-Dayton et al. (2016)	This study focused on helping couples who are dealing with dementia to reminiscence about their life together	Multiple case studies	N= 58		This study showed the importance of variation in the different methods of narration, disseminating the narrative and the cross-cultural applicability of the intervention
Mckeown et al. (2013)	Critically appraise some of the challenges that may emerge through the process of undertaking life story work	Multiple case study	N= 4	Semi-structured interviews	Private and intimate disclosures may emerge uninvited. Involving the family and people with dementia is very complex.

Scherrer et al. (2014)	This study focused on providing meaningful conversations for couples, highlighting their strengths as a couple and enabling them to reflect on their lives.	Multiple case study	N= 40	The Couples Life Story Approach: a structured dyadic intervention which facilitates a structured review of the couples life together.	The couples life story approach, with couples in which one spouse is dealing with memory loss is a promising approach for clinical social work practice
Spilkin et al. (2003)	The aim of this study is to describe the use of conversation analysis as a tool to evaluate conversations between an individual with moderate to severe dementia and his caregiver	A case study	N= 1	Conversational Analysis: analyses real-life conversations in their natural environment	The findings of this study suggested that interactions using memory books can be improved with careful intervention.
Chang et al. 2012	The main purpose of this study was to examine the effects of memory books containing pictures and captions in traditional Chinese	Multiple baseline design	N= 3	-Memory Book study protocol - MMSE - Chinese version of Oral reading screen - 10 conversational codes defined by Bourgeois	The memory books used in this study improved the quality and quantity of all the conversations between the participants and the researcher.
Ingersoll-Dayton et al. (2013)	This study focused on helping couples communicate, reminisce about the story of their relationship. The couples were tasked with finding pictures and mementos from for developing a memory book	A pilot study	N= 48	The Couples Life Story Approach: using a structured life review approach and an adapted legacy therapy	The findings of this study show that the couples enjoyed the process of telling the story of their life together and reviewing the resulting couples life story book. The sessions were most effective when they occurred on a weekly basis
Abu Hashim et al. (2015)	This study presented a personalized digital memory book that combined reminiscence therapy and cognitive stimulation therapy to stimulate the cognitive function of an AD patient	A case study	N= 1	An evaluation form: a questionnaire related to the system	Results from this study indicate that the patient felt motivated and comfortable with the application. The mobility made it easy to access.

Hashim et al. (2013)	This paper described the design and implementation of personalized digital memory book that aimed to teach the user on how to perform prayer.	A case study	N= 1	<ul style="list-style-type: none"> - Interviews - Observation 	The results show that by using the application, it improved the patient's reminiscence and upgraded the social interaction and communication between the patient and the care taker
Haight et al. (2006)	This study focused on testing the effectiveness of a structured life story book process	Pilot study Pre and post tests and a control group	N= 31	<ul style="list-style-type: none"> - Life Review and Experiencing form (LREF) - MMSE - CSDD - AMS - FIM - CS - MBS 	This study showed that the life story book is an effective intervention for people with mild to moderate dementia. The nursing staff can do the intervention with proper training and supervision.
Haight et al. (2003)	This study evaluated life review work carried out with the person with dementia and his care giver, compared with life review work carried out with the care giver alone and an untreated control group.	Qualitative and quantitative: Pre and post-tests with 3 groups including a no treatment group and two case studies	N= 22	<ul style="list-style-type: none"> - Life Review Experiencing Form (LREF) Caregiver: The Burden Interview and The revised BPL Care receiver: FAST, MMSE and MS 	This study showed that a care giver can receive major therapeutic benefits from the life review. Due to the effects of the life review process the need for institutionalization is delayed.
Subramaniam et al. (2016)	To establish an evidence-base for using multimedia digital life story books with people with dementia in care homes	Multiple case study	N= 6	<ul style="list-style-type: none"> - A set of open-ended questions - QOL-AD - AMI - GDS-12R - QCPR 	A person with dementia can contribute to the development of a life story movie. The life story movie produced similar effects to the life story books with linked cognitive and emotional effects.

Research question 1: How are life story books used in interventions for people with dementia?

Type of life story book

The life story books in the Crook et al. (2016) study consisted out of pictures and personal memorabilia. The life story books in the Subramaniam et al. (2014) study depicted the life story of a participant in chronological order, illustrated with pictures from their childhood until the present. The life story books in the Ingersoll-Dayton et al. (2016) study were created by the practitioner with pictures and memorabilia provided by the couple. Three out of the four participants in the Mckeown et al. (2015) study had life story books which were photograph albums that included pictures and text to depict the story of a person. One participant had a pen picture instead of a life story book, which was a two-page written account of the person's life. The life story books created in the Scherrer et al. (2014) study utilized pictures, cards and news items from the couples to document their life together. The social worker used these stories and artifacts to compile the life story book. The Spilkin et al. (2003) study used an individualized memory book created for the participant. It contained pictures of his family, hobbies and interests as well as grammatically simplified questions that elaborated the pictures with text. The memory books used in the Chang et al. (2012) study were constructed by the experimenter and were comprised out of three topics, daily life, myself and my family. Each topic contained ten pictures with printed captions. The life story books in the Ingersoll-Dayton et al. (2013) study were joint life story books for each couple that were constructed by the social workers with pictures provided by the couples. The life story books consisted out of mementos that highlighted significant memories from their shared past and several blank pages for adding future significant events. The mementos included objects such as pictures, postcards, newspaper clippings, and wedding vows. The life story book used in the Abu Hashim et al. (2015) study was a personalized digital book that consisted out of daily routine reminders, pictures and games. The Hashim et al. (2013) study used a personalized memory book that included personal information of the participant, her family and a multimedia application for performing prayer. The life story books used in the Haight et al. (2006) study contained pictures and explanatory captions. The Haight et al. (2003) study used life story books created by the participants with help from their care givers. The life story books were a pictorial history of an individuals life, containing pictures, words and other memorabilia selected by the participants. The Subramaniam et al. (2016) study used

a digitized life story book that was converted into a life story movie. The duration of the life story movies ranged from 12 minutes to 27 minutes with an average of 18 minutes.

In almost all of the studies reviewed, pictures were an essential part of the life story book. Most of the studies combined the pictures with words or captions. In some of the studies, personal memorabilia or memento's were also added to the life storybooks. The life story books were developed by the researcher, the social worker or the care staff. The researchers developed the life story books in most of the studies reviewed. The involvement of the participants varied from selecting the materials for the life story books, to actively compiling the life story books with supervision. In two of the studies, a single life story book was developed for each couple. These joint life story books documented their life together and were compiled by a social worker in both studies. Personalized digital memory books with varying applications including pictures and personal information were developed in two of the studies reviewed. A life story movie was developed in an another study, converted from a digitized life story book with the participants co-editing the movie.

Target group

All the included studies recruited participants with dementia. All five of the participants recruited in the Crook et al. (2016) study had Down Syndrome and dementia. The Subramaniam et al. (2014) study, the Ingersoll-Dayton et al. (2016) study, the Abu Hashim et al. (2015) study and the Haight et al. (2006) study all specifically recruited participants with mild to moderate dementia. The Mckeown et al. (2015) study recruited participants in different stages of dementia. The Haight et al. (2003) study selected participants in different stages of the Alzheimer' disease. The Ingersoll-Dayton et al. (2016 study used the couples life story approach. The participants were recruited in couples, from the United States and Japan. The participants from the Scherrer at al. (2014) study and the Ingersoll-Dayton et al. (2013) study were also recruited in couples. The participants from the Haight et al. (2003) study were selected in dyads. These dyads were comprised out of people with dementia and their care giver. In most cases the care giver was a family member. All participants in this study were cared for at home. The Spilkin et al. (2003) study recruited a 85 year old man who had been diagnosed with Alzheimer's disease seven years ago. The Abu Hashim et al. (2015) study recruited a 74 year old with Alzheimer's disease and the Hashim et al. (2013) study recruited a 67 year old woman diagnosed with Alzheimer's disease in an early stage. The three participants from the Chang et al. study were monolingual mandarin Chinese speakers who had all been diagnosed with dementia. All the participants from the Haight et al. (2006) study

were living in a assisted living facility. The participants from the Subramaniam et al. (2016) study were all living in care homes.

All of the studies recruited participants with dementia, most of the studies recruited participants with mild to moderate dementia. Two studies recruited participants in different stages of dementia and Alzheimer's disease specifically. Participants were recruited in couples in three of the studies reviewed. Most of the participants were living in a nursing home. Participants from some of the studies reviewed were cared for at home by their care giver.

Performance of the intervention and number of sessions

The Crook et al. (2016) study was performed by researchers and staff members of the care homes. The researcher created the life story books. The intervention consisted out of nine sessions, each session lasting 30 minutes, which were all performed during the daytime. The Subramaniam et al. (2014) study was performed by care givers, researchers, therapists and relatives. The intervention was different for the two groups at the start of the intervention. The life review group was involved in the process of making a life story book in the first twelve weeks of the intervention. Each participant received their life story book in the 12th week. After handing out the life story books, the first assessment took place. The second assessment took place in the 18th week of the intervention after all the participants have had their life story books for six weeks. The Ingersoll-Dayton et al. (2016) study was performed by two teams of researchers in the United States and Japan consisting out of at least three social workers, psychologist and a nurse. It was a five week intervention with weekly sessions. The researcher compiled the life story books with pictures and mementos such as letters provided by the couples during the intervention. An entire staff was involved in the intervention in the Mckeown et al. (2015) study. All the participants had a interview and a follow-up and 21 interviews were held among the staff. This study used an individualistic approach when developing the life story books. This means that the needs and abilities of each participant was evaluated and based on this evaluation the best approach for creating a life story book was chosen for the participant. Only the first participant wasn't directly involved in making the life story book but instead his wife was involved. The Scherrer et al. (2014) study was conducted by a team consisting out of two project leaders, a clinical researcher, a dementia care specialist, social work interventionists and research assistants. The intervention was a five week structured dyadic intervention. Social workers visited the couple weekly, usually in their home. The social worker compiles the life story books of the couples using mementos

provided by the couples. The Spilkin et al. (2003) study was performed by a researcher. The care giver of the participant was his 55 year old daughter. It started with two baseline 10 minutes interactions between participant and the care giver. After these interactions, the intervention started. The intervention was a workshop with the care giver that lasted an hour and immediately afterwards as well as one week later, the participant had another interaction of 10 minutes with his care giver. An individualized memory book was created by the researcher and was given to the care giver before the intervention.

The Chang et al. (2012) study was performed by an experimenter. A second observer was present during the intervention. The memory books were produced by the researcher with materials provided for by the relatives of the participants. The intervention took place in three phases. It started with a baseline and was followed by sessions with memory books. Conversations about 3 topics took place during these sessions, the conversation about each topic lasting 5 minutes. The last phase was the follow up. The Ingersoll-Dayton et al. (2013) study was performed by social workers. It was a five week intervention with weekly sessions. The sessions ranged from lasting 40 minutes to two hours. The average time span of a session was 76 minutes. The social worker compiled the life story book with pictures and mementos provided for by the couple. The Abu Hashim et al. (2015) study was conducted by a researcher who gave the participant the memory book. The participant first tests the application for 30 to 45 minutes. The next phase of the intervention are weekly sessions lasting 15 to 30 minutes for the period of eight weeks. All sessions were handled by the care giver of the participant. The Hasim et al. (2013) study was performed by a researcher and the care giver. The intervention consisted out of four weekly sessions. The first session took almost an hour and was performed by the researcher who introduced the digital life story book to the participant, the other three sessions were performed by the care giver. The Haight et al. (2006) study was performed by the nursing staff. The intervention lasts 8 hours in total with a time span of 8 weeks. The first and last week were about consent and pre and post-tests. Life review took place from week 2 to week 6. The nursing staff and the participants worked together to create the life story books, using the perspective of the participants. The Haight et al. (2003) study was performed by the care giver, family and a reviewer. The intervention had a time span of 8 weeks with weekly visits lasting an hour. The two conditions in this study are as follows: either the care giver and the participant joined the life review process separately or only the care giver joined the process. Up to two researchers were present during the intervention. The Subramaniam et al. (2016) study starts with a session with the life storybook

which was created for the participants in a previous study. Then the participants have access to their digital life story books for four weeks. Following these four weeks, the participants fill in a number of questionnaires. Participatory design was used, with the participant actively involved in the decision-making process, designing and creating, and directing their own life story movie with the researcher acting as a co editor.

The researchers performed the interventions and compiled the life story books in most of the studies. Social workers compiled the life story books of participants in two of the studies. Most of the studies also incorporated a multiple professional staff while some other studies were executed by a single researcher. Therapists, family members and nursing staffs were actively involved with the interventions in most of the studies. The care givers were also actively involved in most of the studies. The participants themselves, or their family members if they weren't able to, provided the pictures for the life story books. The participants received their life story books in more than half of the studies reviewed. Two studies both had two different conditions in which one group received their life story books and the other group was involved in the process of compiling the life story books. The participants from three other studies were very actively involved in the process of compiling the life story books. Three studies, that all focused on couples, had five weekly sessions. The sessions in one of these studies had an average length of 76 minutes per session. Four studies had eight to nine sessions, the sessions were weekly in two of these studies. Three other studies started with a baseline interaction or an interview, followed by the intervention and a follow up. An extra follow up took place a week later in one of these studies. One of the studies with two different conditions had their first assessment in the 12th week and the follow up in the 18th week of the intervention. Only one of those groups was involved in the first twelve weeks of the intervention. Participants in another study had their first assessment after four weeks with their digitized life story books. Another study had four weekly sessions with the first session lasting almost an hour. The shortest session lasted 10 minutes and was a baseline interaction. Weekly sessions in another study were the longest and lasted up to two hours.

Research question 2: What are the effects of reminiscence therapy with the use of life story books?

The aim of the study

The aim of the Crook et al. (2016) study was to enhance well-being and changes to behaviour. The aim of the Subramaniam et al. (2014) was to evaluate the effect of two different pathways for developing a life story book. The aim of the Ingersoll-Dayton et al. (2016) study

was to help couples who are dealing with dementia reminisce about their life together. The aim of the Scherrer et al. (2014) study was to provide couples an opportunity for meaningful engagement, to highlight couples strengths and to enable couples to reflectively examine their own life. The aim of the Spilkin et al. (2003) study was to describe the use of conversation analysis as a methodology to identify areas of strength and weakness in conversations between an individual with moderate to severe dementia and his care giver. The aim of the Chang et al. study was to examine the effects of memory books containing photographs and captions in traditional Chinese. The Ingersoll-Dayton et al. (2013) study aimed to help couples communicate and reminisce about the story of their relationship and find photographs and mementos from their past to develop a memory book. The aim of the Abu Hasim et al. (2015) study was to present a digitized memory book that combines reminiscence therapy and cognitive stimulation therapy to stimulate the cognitive function of an patient. The Hashim et al. (2013) study described the design and implementation of a personalized digital memory book. The aim of the Haight et al. (2006) study was to tests the effectiveness of a structured life story book process. The purpose of the Haight et al. (2003) study was to illustrate how life review enables a person to move on. The aim of the Subramaniam et al. (2016) study was to establish an evidence-base for using digital life story books for people with dementia in care homes.

One of the studies focused on the different pathways for developing life story books. A study tested the effectiveness of a structured life story book process and another study focused on illustrating that life review enabled people to move on. Three studies focused on couples reminiscing about their life together. The challenges that emerge through the process of undertaking life story work were evaluated in one the studies and the effects of memory books in traditional Chinese were evaluated in another study. One of the two studies, in which a digital memory book was developed, focused on stimulating the cognitive function of a participant. The other study focused on the design and implementation of the digital memory book. The study in which a life story movie was developed aimed to establish an evidence base for digital life story books for people with dementia in care homes.

Type of study

The methodologies employed by the included studies varied widely. The Crook et al. (2016) study used a randomized single case series while the Subramaniam et al. (2014) used a randomized controlled trial. Four studies were multiple case studies and three studies were a case study. The Haight et al. (2003) study used qualitative and quantitative measure. It

consisted out of pre and post-tests including a control group and two case studies. Two studies were a pilot study and the Haight et al. (2006) also used the pre and post-tests and a control group. The Chang et al. (2012) study used a multiple baseline design.

Out of the studies reviewed, there were three case studies and four multiple case studies. Among the other studies, one study had a randomized single case series and another study had a randomized controlled trial. One study was a mixed methods study and another study used a multiple baseline design. Two other studies were both a pilot study.

Sample size

The sample size ranges from a single person (case study) to 58. The sample size from the Ingersoll-Dayton et al. (2016) had the biggest sample size with 58 elderly participants.

The sample sizes from the relevant studies ranged from a single person in a case study to 58 participants.

Measures

Dementia Care Mapping was used in the Crook et al. (2016) study. Dementia Care Mapping is an observational tool and a method of delivering and evaluating health care. It measures subjective well-being among people who have dementia using direct observation while taking part in a variety of activities. The following questionnaires were applied in the Subramaniam et al. (2014) study: the Clinical Dementia Rating Scale, Quality of Life Alzheimer's Disease, the Geriatric Depression Scale (Residential), Quality of The Care Giving Relationship Questionnaire, Approaches To Dementia Questionnaire, Staff Knowledge of Care Recipient Questionnaire and the Extended version of the Autobiographical Memory Interview. The Ingersoll-Dayton et al. (2016) study used interviews with a structured life review approach in which the couples reminisced together. Semi-structured interviews were used in the Mckeown et al. (2015) study. The Scherrer et al. (2014) study used the couples life story approach, a structured intervention that enables a structured review of the couples life together. Conversational analysis was applied in the Spilkin et al. (2003) study. It is a promising tool to meet the need for individualized intervention. Conversational analysis focuses on real-life conversations occurring in their natural environment. A memory book study protocol, the mini mental state exam, the Chinese version of oral reading screen and ten conversational codes defined by Bourgeios to analyze the conversations with were used in the Chang et al. (2012) study. The couples life story approach, which is a structured life review approach, was used in the Ingersoll-Dayton et al. (2013) study. A questionnaire related to the system of the digital life story book was conducted in the Abu Hashim et al. (2015) study. This

questionnaire was an evaluation form which focused on aspects such as usability and the quality of the product. Interviews and observation were applied in the Hasim et al. (2013) study. This study focused on designing a personalized memory book. The Haight et al. (2006) study and the Haight et al. (2003) study both used the life review and experiencing form which is a series of semi-structured interviews. The Haight et al. (2006) study also used the questionnaires MMSE, the CSDD, the AMS, the FIM, the CS and the MBS. The Haight et al. (2003) study also use the Burden interview and the revised memory behavior problem checklist for the care givers. The care receivers did the functional assessment staging which was designed for clinical use to establish the level of the patients condition and to stage them. The MMSE and the Alzheimer's Mood scale were also applied. The Subramaniam et al. (2016) study used a set of open-ended questions and the Quality of life Alzheimer's disease scale, the Autobiographical Memory Interview, the Geriatric Depression Scale and the Quality of the Care Giving Relationship Questionnaire.

The Autobiographical Memory Interview was used in several studies. The Quality of Life Alzheimer's Disease questionnaire, the Geriatric Depression Scale, the Mini Mental State Examination and the Quality of the Care Giver questionnaire were used in two of the studies reviewed. Conversational analysis was applied in another study. The Couples Life Story Approach was used in two of the studies reviewed. Semi-structured interviews were used in some of the studies, open-ended questions were used in another study. The Life Review and Experiencing Form, combined with, different questionnaires were used in two of the studies. The Mini Mental State Examination was used in both of those studies.

Effects

The Crook et al. (2016) study showed that life story books and rummage boxes were associated with an improvement in well-being and led to changes in behaviour, namely an increase in communicative, expressive and intellectual behaviours, including behaviours which showed attachment to objects. The life review group showed an improvement on the QOL-AD (Quality of Life-Alzheimer's disease) in the Subramaniam et al. (2014) study. There was also a significant intervention effect on the memory test used, the AMI-E (Autobiographical Memory Interview Extended version). The results indicated that a life review process resulting in a life story book is associated with improved autobiographical memory, staff knowledge and attitude. The following challenges emerged in the Ingersoll-Dayton et al. (2016) study: personal disclosures, perspective, the quality of the life story books and the under and overuse of life story books. This study showed that private and

intimate disclosures may emerge uninvited. It also showed the complexity of dealing with people with dementia and their family. Different views were expressed about the content and quality of the life story books. The following themes emerged after analysis in the Mckeown et al. (2015) study: partner affirmation, improved engagement, handling losses and fullness of life as a couple. As a result the following lessons were learned: accommodating different methods or narration, disseminating the narrative and the cross-cultural applicability of his intervention. The couples life story approach, in which one spouse is dealing with memory loss is a promising approach for clinical social work practice according to the results of the Scherrer et al. (2014) study. The findings from the Spilkin et al. (2003) study suggested that an improvement of the quality of interactions was achieved after the intervention. The number of questions asked increased which positively influenced the quality of the interactions. The results suggest that interactions using memory books can be improved with careful intervention. The results from the Chang et al. (2012) study were clear. The performance of all the participants at least doubled or tripled during the treatment phase. The results revealed that memory books containing pictures and simple sentences in traditional Chinese seem to be effective for improving the quality and quantity of the conversations. The findings of the Ingersoll-Dayton et al. (2013) study show that the couples enjoyed telling the story of their life together and reviewing the resulting couple life story book. The sessions were most effective when they occurred on a weekly basis. The Abu Hashim et al. (2015) study showed that the life story book improved the social interaction and communication between the participant and her care giver. The use of the multimedia elements and touchscreen technology made it easy to access. The results from Hashim et al. (2013) study showed that by using the application, it improved the reminiscence of the participant and improved the social interaction and communication between the participant and her care giver. There were significant differences in the Haight et al. (2006) study between the experimental group and the control group on four measures, the Mini-Mental State Examination, the Cornell scale for depression, the Alzheimer's mood scale and the communication observer scale. This study showed that the life story book is an effective tool for people with mild to moderate dementia. It also showed that nursing staff and care staff can administer it with minimal training accompanied by supportive supervision. The Haight et al. (2003) study showed that due to the effects of the life review process, the need for institutionalization is delayed. The results reported suggested that the care giver received major therapeutic benefits from the life review process. All the participants in the Subramaniam et al. (2016) study valued their own life story movie either more than their life story book or at least equally as much. This study has

established that a person with dementia can contribute to the development of a life story movie. The life story movie produced similar effects to the life story books with linked cognitive and emotional effects.

Almost all of the studies reviewed showed that the use of life story books can be very effective for people with dementia. The findings of several studies showed an improvement of the autobiographical memory of people with dementia and their quality of life. The results from another study indicated that the care giver of an individual with dementia can also benefit greatly from an intervention with life story books. Some studies showed that as a result of the interventions with life story books, people with dementia were able to communicate better. The findings from the studies that used the couples life story approach showed that couples can benefit greatly from interventions with life story books. The findings from several studies indicated that a life story book developed in a life review process was more effective for people with dementia and can even delay institutionalization. Another study showed that the effects of a digital life story movie are comparable to the effects of a life review process resulting in the development of a life story book.

Discussion

Aim of the study

This systematic review focused on summarizing the use and effects of life story books in interventions for people with dementia.

The use and effects of life story books

People with dementia, ranging from mild to moderate, were recruited in almost all of the studies reviewed. The participants in all of the studies reviewed were elderly people suffering from dementia. As stated in the introduction, Haight et al. (2003) argued that the process of developing a life story book can be very demanding for people with dementia. Therefore, it is understandable that most of the studies reviewed choose to recruit participants with mild to moderate dementia. Moreover, it is interesting to consider the fact that people with dementia in more severe stages were probably not recruited because the severity of their condition could undermine the process of developing a life story book and diminish the possible effectiveness.

The studies reviewed showed that caregivers, either at home or in a nursing home, are vital and necessary in the process of developing a life story book. The findings of several of the studies reviewed indicated the beneficial value of their close involvement. While most of

the interventions in the studies were performed by the researcher, the interventions in two of the studies were performed by social workers (Scherrer, et al., 2013; Ingersoll-Dayton, et al., 2013). Both studies however used the couples life story approach. In most of the couples visited by the social workers, one person was suffering from dementia while the significant other acted as their care giver. Therapists, nursing staff and family members in particular, were involved in most of the interventions. Most of the studies reviewed emphasized the importance of involving the people closest to the participants with dementia.

Digital life story books for people with dementia were developed in several of the studies reviewed. The results from one of those studies showed that an elderly participant suffering from dementia felt motivated and comfortable using a digital memory book (Abu Hashim, et al., 2015). Furthermore, it was also reported that the use of technology, including touch screen technology, made it easy for the participant to utilize the memory book. Digital life story movies were developed from digitized life story books in another study (Subramaniam & Woods, 2016). The findings from this study showed that all the participants enjoyed viewing their movies. This study also showed that, unlike life story books, digital life story books incorporated music. According to Subramaniam and Woods (2016), background music stimulated the memories of people with dementia. Family members and staff alike reported a positive effect of the life story movie on them as well as on the person they cared for (Subramaniam & Woods, 2016). This study underlines the potential of digital life story books. A study by the same two authors predicted that five years from then, it would be normal for people with dementia to have a digital life story (Subramaniam & Woods, 2012). Despite the incorrect prediction, both studies have shown the importance of continuous development and the possible effectiveness of innovation.

Most of the participants in the studies reviewed received their life story books after completion. Though participants and/or family members provided the materials, they weren't involved in the process of producing the life story books in these studies. Several of the other studies however, did involve participants. Subramaniam et al. (2014) involved people suffering from mild to moderate dementia in a life review process. This study indicated that a life review process, in which a life story book is developed, was associated with improved autobiographical memory. Those participants were actively involved in the process of developing their life story books while the participants in the other group received completed life story books compiled without their personal input. However, the findings from this study

also indicated that life story books developed with the help of relatives without the involvement of the people with dementia, also improved autobiographical memory.

Almost all of the studies took the condition of the people with dementia into consideration because most sessions in the interventions in the studies lasted between 30 minutes and an hour. Sessions occurring weekly were most common among the studies reviewed. In addition, findings from one of the studies that incorporated weekly sessions suggested that sessions were most productive when they occurred on a weekly basis (Ingersoll-Dayton, et al., 2013).

The benefits of life story books for people with dementia was evident in almost all of the studies. Some of the studies showed that life story books improved the autobiographical memory of people with dementia (Subramaniam et al., 2014; Subramaniam & Woods, 2016). The people with dementia in both studies were also more content about their lives after the intervention. Several other studies showed that people with dementia were able to communicate better with other people after the intervention. One of the studies that showed this improvement in communicative behaviour recruited participants with Down syndrome and dementia (Crook, et al., 2016). The people with dementia also showed an improvement in the communication with nursing staff, care givers and relatives. It is remarkable that the effects of life story books are also evident in people with Down syndrome and dementia. This study also showed that life story books were associated with higher levels of well-being. These findings are consistent with the predicted findings mentioned in the introduction (Subramaniam & Woods, 2012). Joint life story books were developed in two studies (Scherrer, et al., 2014; Ingersoll-Dayton, et al., 2013). Unlike the life story books developed in the other studies, which were all developed for individuals, these life story books were developed for couples. These joint life story books focused on the life that couples lead together. The findings from these studies showed that joint life story books improved the communication between couples and strengthened their identity as a couple.

Whenever the participants talked or reminisced about their past, another effect of life story books emerged. The participants became sad when they were reminded of the people that they had lost in their lives. Almost all of the participants in the studies reviewed had positive reactions to the life story books, some were simultaneously reminded of their losses as well. These feelings should be regarded as natural and are part of their life stories. Mckeown et al. (2015) argued that the information necessary for developing a life story book was very personal. Therefore, this study emphasized the importance of handling personal

information. Improvements in staff attitudes and knowledge were evident in another study (Subramaniam et al., 2014). Another study concluded that caregivers could benefit greatly from interventions with life story books for people with dementia (Haight, et al., 2003). Moreover, this study showed the specific benefits attributable to the care giver. When the life story books have effect on the care recipient, the care giver can take care of the participant more easily. The findings of this study also suggested that using life story books can delay institutionalization. This finding is very promising regarding the problems due to the aging world population. As stated in the introduction, Subramaniam and Woods (2012) stated that reminiscence therapy could also be beneficial for family members and caregivers of people with dementia. This systematic review showed that interventions with life story books are indeed also beneficial for family members and caregivers.

Strengths and limitations

One the most important limitations of his systematic review was the criteria for excluding and including studies. The use of life story books is a specific reminiscence therapy and as a result, the number of relevant articles was limited. One of the most important criteria was that a life story book had to be used in the intervention. One study (Chung, 2009), despite being relevant, was excluded on this criteria. This study did not incorporate life story books in the intervention but used predetermined topics instead. Articles that were peer-reviewed, published and written in English were included in the systematic review. It is possible that as a result of the criteria, relevant studies were overlooked. Studies that were not published or were not an article were not included. It is possible that the overview of life story books in this systematic review would have been more exhaustive if these studies were included.

This systematic review incorporated different types of studies such as case studies, multiple case studies and a randomized controlled trial. It was often challenging to compare studies with such fundamental differences. While the case studies provided insights in the effects of life story books, the results of the randomized controlled trial were more conclusive and generalizable. Most of the studies included in this systematic review were either a case study or a multiple case study. Therefore, the lack of randomized controlled trials in this systematic review is a constraint.

Another constraint in this study was the exclusive focus on short-term benefits for people with dementia. While most studies used a pre and post measure, almost all of these measures were used up to 6 weeks after the intervention. Some of the studies proved the short-term benefits of life story books, such as improved autobiographical memory and

communication, but none of the studies measured long-term effects explicitly. The participants in the Subramaniam & Woods (2016) study took part in an intervention with life story books two years prior to this study. All of the participants wanted to participate because they had done it before and were familiar with the benefits. This is the only indication of a possible long-term effect. Another limitation was the small sample size in some of the studies. The largest sample size in a study with individual life story books was 33 (Haight, et al., 2006). However, the studies have shown that developing a life story book can be very complex, therefore it is also understandable that the sample sizes are relatively small.

One of the most important and innovative strengths of this study was the focus on life story books for people with dementia. Unlike other reviews, this systematic review focused explicitly on interventions with life story books for people with dementia. Another strength was that despite the variation in the types of studies, this systematic review underlined the effectiveness of interventions with life story books. This systematic review also provided an overview of different types of life story books used in different settings. This emphasized the applicability of life story books in different settings.

Implications for future practice

This systematic review showed that people with mild to moderate dementia were recruited most often for interventions with life story books. Therefore it is crucial for future practice to recruit participants with mild to moderate dementia. This study also showed that while researchers and social workers compiled most of the life story books, nursing staff could also administer the process. However, it is essential that these professionals receive proper training and supervision (Haight et al., 2006). Most of the sessions in the studies in this systematic review occurred weekly. According to Ingersoll-Dayton et al. (2013), sessions were most productive when they occurred on a weekly basis. Therefore, it is important for future practice to incorporate weekly sessions in the interventions with life story books.

All life story books, and digital life story books, in this systematic review incorporated pictures with words or captions. Therefore it is essential, in future practice, to incorporate pictures with words or captions. This systematic review also displayed the great potential of digital life story books. Further research is needed to explore the possibilities and the effectiveness of digital life story books. This systematic review also showed that joint life story books, created for a couple instead of an individual, were very effective in improving the communication between couples and strengthening their identity as a couple. Elderly people that talked about their history were also saddened by their losses. These feelings were

regarded as a consequence of a natural process. In future practice, these feelings should be taken into consideration before the intervention. This systematic review showed that life story books effected autobiographical memory, the quality of life, communication, social interaction and well-being. Moreover, previous studies have shown the positive effects of life story books. Despite the clear short-term benefits, none of the studies reviewed measured long-term effects of life story books.

Because of the aging world population, the number of elderly people suffering from dementia will increase rapidly. Therefore, life story books can be an important tool for people with dementia. The digital development of the life story book is also promising because as a result, people with dementia may have better access to their life story books.

In conclusion, interventions with life story books show great potential in helping people with dementia, their care givers, and relatives. The application of digital life story books is very promising. This systematic review indicates that life story books can have a great beneficial value for people with dementia in a digital world with a rapidly ageing world population.

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