

Nostalgia as a psychological resource for people with dementia: a systematic review and meta-analysis of evidence of effectiveness from experimental studies

Objective: This review systematically examines the evidence of effect of nostalgia on psychological well-being through a meta-analysis of measures of social connectedness, self-esteem, meaning in life, self-continuity, optimism, and positive and negative affect.

Rationale: Analyses were carried out to assess how nostalgia may be used as a clinical intervention to boost well-being in dementia by reducing threat.

Results: Searches carried out in July 2014 and updated in February 2018 identified forty-seven eligible experimental studies comparing nostalgic reminiscence and non-nostalgic reminiscence to be included in the meta-analysis. Nostalgic reminiscence had moderate effects on positive affect [0.51 (0.37, 0.65), $p= 0.001$], social connectedness [0.72 (0.57, 0.87), $p= 0.001$], self-esteem [0.50 (0.30, 0.70), $p= 0.001$], meaning in life [0.77 (0.47, 1.08), $p= 0.001$] and optimism [0.38 (0.28, 0.47), $p= 0.001$]; and a large effect on self-continuity [0.81 (0.55, 1.07), $p= 0.001$]. There were however no effects on the differences between nostalgic reminiscence and non-nostalgic reminiscence for feelings of negative affect [-0.06 (-0.20, 0.09), $p= 0.443$].

Conclusion: This systematic review and meta-analysis provides an overview of the evidence base for nostalgia as an intervention for people with dementia, for instance, by adapting current reminiscence and life review techniques. This meta-analysis will hopefully, also serve as a valuable reference point for the continued exploration of nostalgia as an intervention.

Keywords: nostalgia; dementia; reminiscence; systematic review

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Introduction

Nostalgic reminiscence involves the recall of the past by deliberately focusing on cherished and happy memories (Sedikides, Wildschut, & Baden, 2004). Several studies have suggested that nostalgic reminiscence enhances key psychological resources among non-clinical populations (Sedikides et al., 2015) that act as buffers against anxiety arising from threat. As such, these studies provide emerging evidence that nostalgic reminiscence has the potential to be used as an intervention with clinical populations (Routledge, 2015; Routledge, Wildschut, Sedikides, & Juhl, 2013). This may be especially important where people face an existential threat to their identity, as is the case for people with dementia (Cheston, Christopher, & Ismail, 2015).

As nostalgic reminiscence is increasingly studied as a psychological resource for people with dementia (Ismail, 2017), it is important to have a clear and robust synthesis of the evidence of effectiveness from those studies within non-clinical populations in terms of effect size. Although most experimental studies suggest that nostalgic reminiscence has statistically significant positive impact on several psychological resources than non-nostalgic reminiscence (Routledge, 2015), it is important to understand whether the beneficial impact of nostalgic reminiscence will be of a size and consistency that would translate into an appreciable clinical effect.

Previous social psychological studies may have shown statistically significant differences between nostalgic and non-nostalgic reminiscence, but the size of this effect (effect size) is rarely reported. Only one non-systematic literature review has been conducted so far on the psychological effects of nostalgic reminiscence (Sedikides et

al., 2015). However, this review only provides theoretical perspectives and descriptions of the effect of nostalgic reminiscence and neither combines these results using a meta-analysis, nor calculates the effect size of these interventions.

Computing the effect sizes from the results of previous studies would therefore help to inform a decision as to whether nostalgic reminiscence has the potential to act as an intervention among people with dementia (Fritz, Morris and Richler, 2012).

Moreover, as the impact of nostalgic reminiscence is mediated by a range of psychological resources (including social connectedness, self-esteem, meaning in life, self-continuity, optimism and affect), so a meta-analysis will explore the theoretical underpinnings of reminiscence in general and nostalgic reminiscence in particular. This systematic review and meta-analysis thus provides a foundation from which to extend the investigation of nostalgia to people with dementia.

Methods

The methodology used in this systematic review and meta-analysis followed the procedure laid out in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Liberati et al., 2009) with a protocol being published in advance¹.

Eligibility Criteria

The systematic review focused on psychological resources that have previously been suggested to be the main resources of nostalgia (Hepper et al., 2012). Outcome

¹ International Prospective Register of Systematic Reviews with registration ID:

CRD42014009848

measures searched for were social connectedness, self-esteem, meaning in life, self-continuity, optimism and positive and negative affect. We further restricted our search to experimental studies which clearly measured these psychological resources either using an ordinal scale or by analysing participants' narratives, as these arguably provide the strongest supporting evidence about the effectiveness of a potential intervention (Coolican, 2009).

Consequently, we excluded those studies which included different measures of related resources such as interest in new opportunities for self-esteem or life satisfaction to avoid ambiguity in selecting outcomes. In addition, as the focus of this systematic review was on the direct effects of nostalgic reminiscence, we included only those experimental studies which manipulated nostalgia as the sole independent variable (i.e. studies which compared nostalgic and non-nostalgic reminiscence). Finally, we limited our meta-analysis to studies in English, but there were no restrictions on publication status or date or the socio-demographic characteristics or health status of participants.

Search strategy

An initial search process started in July 2014 and was later updated in February 2018. Studies were identified by searching two main sources: electronic databases (Medical Literature Analysis and Retrieval System Online – MEDLINE; PsychINFO®, Cumulative Index to Nursing and Allied Health Literature - CINAHL Plus, the Cochrane Library; 'Excerpta Medica dataBASE' - EMBASE; ISI Web of Science and Ethos); and other literature sources including grey literature sources and relevant websites (The British Library, System for Information on Grey Literature in Europe -

SIGLE, Zetoc and the Southampton University Nostalgia Group page²).

References of identified studies were also hand-searched. Apart from Ethos, Zetoc and SIGLE where only the search term, 'nostalgia' was used, 'nostalgia', was combined separately with search terms for social connectedness, self-esteem, meaning in life, self-continuity, optimism and positive and negative affect for the other literature sources. Appropriate truncation and Boolean terms were used to facilitate the widest possible relevant search.

Data collection

Selection of studies

The selection of studies is detailed in Figure 1. All papers (articles) identified from the information sources were exported to a reference management software, where exact duplicate records were removed. The identified papers were screened based on their titles and abstracts, then full text, and those not directly relevant to the aim of the systematic review were excluded using an eligibility form defining inclusion and exclusion criteria. After the identification, screening and eligibility assessment had been completed, remaining studies were included in the systematic review with data being extracted from these studies.

Data extraction and management

The data extraction form used in this systematic review was adapted from the one set out in the Cochrane Collaboration (Higgins and Green, 2011) and was thus originally

² <http://www.southampton.ac.uk/nostalgia/publications.page>

designed for clinical trials. While this meant that the analysis switched between clinical and social psychological paradigms, it was important to apply the standards of clinical research to laboratory experimental methodologies, if the potential of these studies is to be extended to clinical populations was to be realised. We pilot-tested the data extraction form using four randomly selected studies (experiments) included in the systematic review. Where necessary, modifications to the data extraction form were made before applying it to the remainder of the studies. The data extraction process was carried out independently by one reviewer (SI). The data extracted from each study were: (1) characteristics of the study participants; (2) the type of nostalgia manipulation; (3) the type of psychological resources; (4) the results and (5) other information. Where necessary, additional information was requested from the authors of seven of the studies with four of the authors responding to the request.

We also developed a tool to assess the risk of bias of the studies, modifying the risk of bias tool recommended by the Cochrane Collaboration. However, this data has not been included in this paper as it did not significantly advance our understanding of the scientific quality of the studies. The implications of this will be discussed later.

Data analysis

A meta-analysis was chosen as the studies contained sufficient homogeneity to be grouped based on outcome measures. Both published and unpublished data on the means and standard deviations were included in the meta-analysis to minimise publication bias (Dwan et al., 2008). The analysis was performed on three key aspects of each psychological resource: the collective effect sizes; heterogeneity of the effect sizes; and moderating effects of the study characteristics on the effect sizes.

Effect sizes. The reporting of individual study results may be imprecise and may not reflect the actual impact of nostalgic reminiscence. To address this issue, the effect sizes and precision (confidence intervals) for the differences in effects on the psychological resources of nostalgic (compared to non-nostalgic) reminiscence were computed. The psychological resources explored in the individual studies were assessed using either different scales of measurement or by analysing the narratives of participants. As a result, the effect sizes were calculated using the standardised mean differences (ESsm).

The effect sizes for those studies that reported or provided sufficient information upon request were estimated by calculating the mean difference between the experimental and control groups and dividing the results by the pooled standard deviation (Lipsey & Wilson, 2001). When studies did not report, or provide, the means or standard deviations or sample sizes for the groups, the F or t statistic was used to estimate the effect size according to established procedures (Lipsey & Wilson, 2001; Rosenthal, 1991).

The effect sizes were then transformed to correct for upward bias using the small sample size bias correction (Lipsey & Wilson, 2001). That is, the effect sizes were not analysed and combined in their raw form as these are subject to upward bias when sample sizes are small. The transformed effect sizes were then combined statistically to increase the power and improve the precision of the overall differences in effect between nostalgic reminiscence and control conditions for the psychological resources. The combined effect size was calculated by using the inverse variance in weighting the effect size of each psychological resource. Thus, studies with bigger sample sizes contributed more to the combined effect size than those with smaller sample sizes. This was done using an SPSS macro created by Lipsey & Wilson (2001; p. 209).

Finally, the precision of all the estimates at the 95% confidence limits was estimated by using the individual study effect size corrected for upward bias and their standard errors (Lipsey & Wilson, 2001). The interpretation of the effect sizes produced followed Cohen (1992) classification of effect sizes of 0.80, 0.50 and 0.20 as large, medium and small, respectively.

Heterogeneity of the results. Conventionally, the term heterogeneity or statistical heterogeneity is used to describe the variability in effect sizes resulting from the study characteristics or the methods employed in the studies. Heterogeneity was tested using the I^2 statistic to measure inconsistency. The I^2 statistic shows the proportion of the overall variation in the effect sizes estimated, because of heterogeneity, instead of chance occurrence. This measure has an advantage over the conventional measure of the chi-squared statistic (Cochran's Q), in that it is independent of the number of studies (Higgins, Thompson, Deeks, & Altman, 2003).

We took a broader perspective in this systematic review by exploring the effect of nostalgic reminiscence against non-nostalgic reminiscence, irrespective of the characteristics and methodological variations among these studies. This means that it is still appropriate to combine studies even if a high degree of heterogeneity is observed (Higgins et al., 2011). Hence, the results were combined using the random-effects model to incorporate any heterogeneity observed.

Moderating effects. The experimental studies exploring differences in the psychological resources varied in their effect sizes. As these variations may have resulted from differences in the individual study characteristics, the meta-analysis also sought to investigate the characteristics of the included studies that may have contributed to the differences in such effect sizes. The potential moderating variables were identified on

theoretical bases to include study characteristics such as sample size, type of participants, gender, the mean age of participants, the form of nostalgia manipulation, the nostalgia manipulation check and state nostalgia. We formed dummy variables for all categorical measures before performing the weighted multiple regression to enable meaningful interpretation of the results for these variables (Cohen, Cohen, West, & Aiken, 2013).

Statistical analysis for potential moderators. Potential moderating variables were analysed using weighted multiple regression techniques, which have been shown to be the most reliable way of reducing the inter-correlations among various independent variables in multiple regression (multicollinearity) (Lipsey & Wilson, 2001). An exploratory procedure was used consisting of a forward selection approach followed by backward elimination to select the variables to include in the regression model. This procedure has been successfully used in a previous meta-analysis (Burke, Martens, & Faucher, 2010).

Results

Results of the search

Figure 1 summarises the results of the systematic search process and the summary reasons for excluding some papers and experiments. The search of the literature sources provided a total of 995 papers of which 899 papers remained after duplicates were removed. An additional 859 papers were then discarded after reading the titles and abstracts of these papers. As some papers contained multiple experimental studies, a paper was retained for further assessment if it contained at least one individual experimental study that met the inclusion criteria.

The full texts of the 40 papers that remained were then examined in detail and a total of 103 experiments were obtained from these papers. Each experiment was assessed independently at this stage. Fifty-six experiments were excluded for several reasons (see Figure 1). This process left 47 experiments (from 25 papers) to be finally included for analysis.

Figure 1. Flow of information through the selection of studies for inclusion in the meta-analysis

Included studies

Table 1 shows the characteristics of the individual studies included in the meta-analysis.

Table 1. Characteristics of studies comparing nostalgic reminiscence to non-nostalgic reminiscence on several psychological resources

Participants

The 47 experiments contributed a total of 5,043 participants to the meta-analysis. The sample sizes for the studies contained in the meta-analysis ranged from 24 to 664 participants, and the mean age of participants included in the meta-analysis was 23.18 years. However, none of the studies included a clinical population and, in most cases, (64%) the participants recruited were undergraduate students.

Nostalgic reminiscence (nostalgia) arm

Nostalgic memories were evoked using two main techniques – an event reflection technique and a music-evoking technique. For studies that used the event reflection technique, participants were instructed to recall nostalgic memories of the past and to immerse themselves in their nostalgic recollections. In the music-evoking techniques, participants were instructed either to listen to a known piece of music that they felt

nostalgic about or to read the lyrics of a song they felt nostalgic about. More than three quarters (87.2%, n= 41) of the studies included in the meta-analysis used the event reflection technique to evoke nostalgia, with the remaining studies (12.8%, n= 6) using music to evoke nostalgic feelings.

Non-nostalgic reminiscence (control) arm

In the control groups for the two main forms of inducing nostalgia (event-reflection nostalgia and music-evoked nostalgia), similar instructions to the ones used for the nostalgia induction were given to participants. However, for these participants, the focus was on ordinary memories. For some of the studies, the nostalgia and control conditions were paired so that people listened to precisely the same music or read the same song lyrics but had different reactions to it.

Psychological resources

Table 2 presents the effect size distribution within a random effects model and heterogeneity of the results for the various psychological resources. Some studies measured more than one resource or measured the same resource in diverse ways. In both cases, all the resources measured were included in the results.

Table 2. Effect of nostalgic reminiscence (compared to non-nostalgic reminiscence) on various psychological resources

Social connectedness. Sixteen experiments measured social connectedness as a psychological resource. The results of all sixteen studies showed significant increases in social connectedness in favour of the nostalgia arm. However, there was significant variation (heterogeneity) in the results, $I^2 = 52.76%$, $p = 0.007$. The overall effect size was 0.72, 95% CI (0.57, 0.87). Using the forward selection followed by the backward

elimination method, a significant model emerged ($QM(7, 4) = 23.60, p = 0.002$). This model explains three-quarters of the variance ($R^2 = 0.757$). Table 3 gives information for the predictor variables in the model. The only predictors of social connectedness were gender ($p = 0.035$) and sample size ($p = 0.032$). Thus, women predicted less social connectedness compared to men, and larger sample sizes predicted increases in social connectedness.

Table 3. Final regression model for moderators of the effect size of social connectedness

Self-esteem. In total, eleven experiments contributed to the analysis of self-esteem.

Eight of the eleven studies produced significant increases in self-esteem in favour of the nostalgia arm while three studies (Hepper, 2012 - exp7; Wildschut, 2014 – exp2a and b) showed no statistically significant differences in self-esteem between the nostalgia and control arm. Nonetheless, the overall effect size was 0.50 (95% CI: 0.30, 0.70) in favour of the nostalgia arm. There was considerable variation in the effect sizes, $I^2 = 75.70\%$, $p = 0.001$. The moderating analysis produced a significant model ($QM(5, 3) = 34.78, p = 0.001$) but none of the factors included in the model were significant predictors of self-esteem.

Meaning in life. In the meta-analysis, seven experiments measured meaning in life as a psychological resource. All seven studies produced significant increases in meaning in life in favour of the nostalgia arm, and there was significant variation in the results, $I^2 = 58.77\%$, $p = 0.024$. The overall effect size was 0.77 (95% CI: 0.47, 1.08). A non-significant model was produced from the regression analysis ($QM(2, 1) = 3.55, p = 0.170$) and none of the variables included in the model were significant predictors of meaning in life ($ps > 0.05$).

Self-continuity. Six studies measured self-continuity as a psychological resource and all these studies produced significant effects in favour of the nostalgia arm. The overall effect size was 0.81 (95% CI: 0.55, 1.07). The results of the studies were not homogeneous as shown by an I^2 value of 56.00%, $p = 0.045$. In the multiple weighted regression, a significant model emerged for self-continuity (QM (4, 1) = 10.62, $p = 0.031$). The model explains 93.5% of the variance ($R^2 = 0.935$). Table 4 gives information for the predictor variables in the model. Sample size was the only significant predictor of self-continuity ($p = 0.027$). Interestingly, a unit increase in sample size predicted a 1.13 unit decrease in self-continuity ($ps > .05$).

Table 4. Final regression model for moderators of the effect size of self-continuity

Optimism. Nine studies measured optimism as a psychological resource of nostalgia. All nine studies produced significant increases in optimism in the nostalgia arm more than in the control arm. The overall effect size was 0.38 (95% CI: 0.28, 0.47). There was no heterogeneity in the results ($I^2 = .00\%$, $p = 0.739$) and the multiple weighted regression did not produce a significant model for optimism (QM (4, 1) = 2.77, $p = 0.560$).

Positive affect. The thirty-six studies that measured positive affect as a psychological resource produced a broad range of effect sizes (-0.72 to 1.40) with substantial variations in effect sizes, $I^2 = 70.90\%$, $p = 0.001$. Eighteen of these studies produced significant positive affect in favour of the nostalgia arm ($ps < .05$), while another eighteen studies showed no significant difference in positive affect between the two arms ($ps > 0.05$). However, the overall effect size of the combined studies showed a significant increase in positive affect in favour of the nostalgia arm, 0.51, (95% CI: 0.37, 0.65).

A significant model emerged for positive affect (QM (7, 16) = 28.19, $p = 0.001$). The model explains 58.1% of the variance ($R^2 = .581$) (Table 5). The effect size of state nostalgia was the only significant predictor of positive affect, $p = 0.020$. Thus, a unit increase in state nostalgia results in a 0.44 increase in positive affect.

Table 5. Final regression model for moderators of the effect size of positive affect

Negative affect. Sixteen studies measured negative affect as a psychological resource of nostalgia. Fourteen of these experiments did not produce any significant difference in negative affect between the nostalgia and control arms ($ps > .05$). However, two studies showed significant differences in negative affect between the two arms such that, the control arms reported more negative affect than the nostalgia arms ($ps < .05$).

Meanwhile, overall, there was no significant difference in negative affect between the nostalgia and control arms when the results of all sixteen studies were combined (-0.06, 95% CI: 0-.20, 0.10). The results produced by the sixteen studies for negative affect were homogenous, as shown by an I^2 value of 38.7%, $p = 0.058$.

A significant model emerged for negative affect in the weighted multiple regression (QM (5, 17) = 14.95, $p = 0.011$). That is, the model explains 69.6% of the variance ($R^2 = .696$) (Table 6). The nostalgia manipulation check and mean age of participants were significant predictors of negative affect ($p = 0.001$ and $p = 0.040$, respectively). That is, performing a nostalgia manipulation check predicts a 1.16-unit increase in negative affect, and a one-unit increase in mean age predicts a 0.65-unit increase in negative affect.

Table 6. Final regression model for moderators of the effect size of negative affect

Discussion and conclusion

This meta-analysis has synthesised the findings of 47 experiments through a systematic and rigorous process with a specific focus on the psychological resources linked to nostalgic reminiscence. In particular, our results confirm the beneficial psychological benefits of nostalgic reminiscence identified elsewhere (e.g. Sedikides et al., 2015). If, as has been argued elsewhere (Cheston, Christopher and Ismail, 2015), dementia is experienced as an existential threat, then it is important to identify ways in which the psychological resources of people with dementia can be strengthened. Due to the buffering effects of nostalgic reminiscence, these findings have important implications for dementia care.

Nostalgic reminiscence, therefore, has the potential to inform clinical practice in some areas. In particular, in reference to clinical interventions that draw on the past, such as general Reminiscence and Life Review Therapies. However, even though several reviews and meta-analysis have been published on reminiscence activities (Hsieh & Wang, 2003; Lin, Dai, & Hwang, 2003; Peng, Huang, Chen, & Lu, 2009; Subramaniam & Woods, 2012), the distinction between nostalgic and non-nostalgic reminiscence has not to our knowledge previously been made within dementia care. Reminiscence activities, therefore, involve the use of the past as a psychological resource. However, there is no particular focus on nostalgic memories. Given the differential impact of nostalgic and non-nostalgic recall on the psychological resources identified here, the efficacy of purely reminiscence interventions should be questioned. Moreover, by understanding the way in which nostalgia has an impact on psychological functioning, we can also begin to tease out the potential therapeutic benefits of such therapy.

Nostalgic reminiscence increases positive (but not negative) affect

The meta-analysis has shown that, compared to non-nostalgic reminiscence, nostalgic reminiscence increases positive (but not negative) affect. While some studies did not find a statistically significant difference in positive affect between nostalgia and control conditions, an equal number of studies did report statistically significant differences. Moreover, when the results of all these studies were combined, there was a statistically significant difference in positive affect between the nostalgia and control arms, and a moderate effect size was produced.

At the same time, combining the results of all the studies that measured negative affect in the meta-analysis showed no statistically significant difference in negative affect between the nostalgia and control arms. These findings are consistent with theoretical arguments that portray nostalgia as a predominantly positive emotion (Johnson-Laird & Oatley, 1989; Werman, 1977). Thus, while nostalgia has a touch of bitterness alongside the sweetness, that is, produces both positive and negative affect, it is mainly positive in affect, (Best & Nelson, 1985; Hertz, 1990; Peters, 1985).

Nostalgic reminiscence increases social connectedness, self-esteem and meaning in life.

The results of this meta-analysis clearly indicate that nostalgic reminiscence leads to significant increases in social connectedness and meaning in life. Thus, in comparison to the control condition, all studies included in the meta-analysis showed differences between nostalgic and non-nostalgic reminiscence, with the combined effect sizes for social connectedness and meaning in life being moderate. Similarly, although three experiments did not find a statistically significant difference in self-esteem between the nostalgia and control arms, most studies (n= 8) did find significant increases. Moreover,

the overall effect size after combining these studies showed that there was a moderate effect of nostalgic (relative to non-nostalgic) reminiscence on self-esteem.

Nostalgic reminiscence increases self-continuity and raises optimism

Our results lend support to the idea that nostalgia increases self-continuity and raises optimism (Cheung et al., 2013; Sedikides et al., 2016). All the studies included in the meta-analysis produced significant positive effects of self-continuity and optimism in favour of the nostalgia arm, with a large, overall effect size for the differences in self-continuity, and a moderate effect size for the differences in optimism.

Moderating effects on the differences in psychological resources

Despite a diversity of methodological designs and socio-demographic characteristics, the results from the studies were consistent and suggestive of a range of psychological benefits of nostalgia. Studies included in the meta-analysis used different forms of manipulating nostalgia, with a wide age range, different populations, variable sample size and different gender mix. Nonetheless, the results consistently indicated that nostalgic reminiscence has medium-to-large positive effects on the psychological resources of social connectedness, self-esteem, meaning in life, self-continuity, optimism and positive affect. While many of the studies were limited by their reliance on undergraduate student participants, this did not mitigate the significant effect of nostalgia on any of the psychological resources. This implies that similar effects of nostalgic reminiscence can be expected in other populations.

However, the effects of nostalgic reminiscence on some occasions were moderated by age, the nostalgia manipulation check, state nostalgia, gender and sample size. Attempts to attribute various explanations to these moderating effects as they currently stand may be spurious as by far the greatest influences on the psychological

resources of nostalgic reminiscence are likely to be from individual differences in trait characteristics including attachment styles, nostalgia proneness, narcissism, neuroticism and resilience (Routledge, 2015). Nevertheless, none of these individual differences was measured in the studies included in the meta-analysis.

Methodological quality and limitations of the meta-analysis

This systematic review and meta-analysis has several robust, methodologically-sound elements, including clear and justified eligibility criteria. However, when researchers were contacted requesting any unpublished data that could be relevant to this meta-analysis, we were unable to identify additional, unpublished data to include. It is, therefore, not possible to tell whether such data exists and whether, consequently, there is a potential publication bias in our findings.

The search process involved multiple sources, and the search strategy was deliberately wide to include all relevant literature. We maintained statistical independence in the analysis by computing effect sizes for independent studies using an appropriate procedure (inverse variance weighting). This meta-analysis also tested heterogeneity in effect sizes, and as was suitable for the analysis, it used and reported a random effects model. The appropriate and justified procedure, weighted multiple regression, was used to test for the influence of moderators.

To facilitate the extension of nostalgia work from social psychology into clinical research, we initially attempted to adapt the risk of bias tool used by the Cochrane Collaboration (Higgins et al., 2011) as a way of assessing the methodological quality of studies. However, this did not prove successful and, ultimately, we decided against assessing the studies in this way. Nevertheless, future studies aiming to extend experimental work on nostalgia should seek to address forms of biases such as

selection, performance, detection and attrition as appropriate in the conduct of their studies (Higgins et al., 2011).

Implications of the meta-analysis for clinical practice

A meta-analysis by Pinguart and Forstmeier (2012) concluded that the post-test results of reminiscence (in comparison to control conditions) have the following effect sizes: social integration (0.31); self-esteem (0.20); and purpose in life (0.48). In contrast, the results of this systematic review and meta-analysis comparing nostalgic reminiscence with control conditions show comparatively stronger effects for the largely similar psychological resources of social connectedness (0.72), self-esteem (0.50) and meaning in life (0.77). While there are clear differences between the clinical studies reviewed by Pinguart and Forstmeier (2012) and the laboratory-based work that has been examined in the current meta-analysis, the effects of nostalgic reminiscence shown in this meta-analysis compare favourably. Consequently, this analysis supports the use of nostalgic reminiscence as a psychological resource for clinical populations in general, but more specifically as an intervention for people with dementia. However, we are aware that the mean age of participants used in our meta-analysis (23.18 years) is relatively younger compared to people with dementia in general. Nevertheless, our meta-analysis strengthens arguments for nostalgic reminiscence to be considered as a potential intervention for people with dementia.

Overall, this systematic review and meta-analysis presents consistent and robust evidence for the positive effects of nostalgic reminiscence on social connectedness, self-esteem, meaning in life, self-continuity, optimism and positive affect, although we cannot comment on the quality of that evidence. The findings from this meta-analysis confirm the importance of extending nostalgia research into clinical populations,

especially cases where there is a sense of existential threat, as is the case with dementia (Cheston, Christopher, & Ismail, 2015). A research programme that we are involved in is carrying out just such work by exploring the impact of nostalgia with people with dementia. So far, results are encouraging, although this work is at an early stage. In two separate experimental studies using people with mild-to-moderate dementia as the study population, one study using the event-reflection technique and another study using music replicated the findings of the positive psychological effects of nostalgic reminiscence (compared to non-nostalgic reminiscence) on social connectedness, self-esteem, meaning in life, self-continuity, optimism and positive affect (Ismail, 2017).

Similarly, preliminary findings from a third study with participants with mild levels of cognitive impairment arising from their dementia showed that compared to controls, participants who recalled a nostalgic memory, showed significantly improved recall of statements about dementia. In particular, recall of highly negative statements was significantly improved, while negative affect remained unchanged. A regression analysis suggests that the effects of the nostalgia manipulation were mediated by levels of positive affect (Christopher et al., 2017).

In conclusion, nostalgic reminiscence has significant clinical potential, not only as an intervention but also as a means of improving the efficacy of existing interventions such as Reminiscence Therapy. However, the translation of nostalgic reminiscence into a substantive, evidence-based intervention calls for further research with clinical populations using more robust methodological procedures.

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