**Table 1**

| Author | Year | Study design | Sample | Setting | Country | Main outcomes |
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For engagement styles, older adults with dementia showed more constructive engagement during cross- age programmes, based on Montessori educational methods, relative to controls in a cross-over trial (Lee, Camp, & Malone, 2007) as well as in another study for Montessori-based teaching activities by older people paired with children (Camp, Judge, Bye et al., 1997), and a group-based multi-component intervention including Montessori activities (Judge, Camp, & Orsulic-Jeras, 2000). Interestingly, no case of disengagement was found, when children and older adults worked together with no aggressive behaviours exhibited (Camp, Judge, Bye et al., 1997). However, in the Japanese study, non-signi f cant changes in withdrawn and disoriented behaviours were observed (Yamagami, Oosawa, Ito, & Yamaguchi, 2007). In addition, when looking at the levels of agitation, observed by caregivers such as nursing staff on the days when the cross-generational music activities were taking place, it was found that older adults exhibited lower levels of agitation (Ward, Kamp, & Newman, 1996). However, the Japanese study also showed non-signi f cant changes in irritable behaviours after the activity reminiscence therapy programme (Yamagami, Oosawa, Ito, & Yamaguchi, 2007).

Concerning quality of life, there was good evidence in an intergenerational reminiscence programme facilitated by young volunteers from Hong Kong (Chung, 2009), while another study for a structured education-based reminiscence programme from Ireland (O'Shea, Devane, Cooney et al., 2014) showed mixed results, depending on the different methodologies employed. Statistically signi f cant improvements in quality of life were found using a protocol analysis, while non-signi f cant results were reported, based on an intention-to-treat analysis (O'Shea, Devane, Cooney et al., 2014).

Looking at psychological health a signi f cant decrease in stress levels was shown in studies evaluated alongside randomised controlled trials (George, 2011; George, Whitehouse, & Whitehouse, 2011). In particular, older people in the cross-age programme showed signi f cantly decreased levels of stress, whereas increased stress was reported among those involved in workshops with their peers. In terms of caregiver burden, a non-signi f cant change was reported between the intervention and control groups (Yamagami, Oosawa, Ito, & Yamaguchi, 2007). A signi f cant reduction in depression was reported between pre- and post-tests (Chung, 2009). However, some studies such as the intergenerational volunteering programme based on a randomised controlled trial (George & Singer, 2011), the Irish study (O'Shea, Devane, Cooney et al., 2014) and the Japanese study (Yamagami, Oosawa, Ito, & Yamaguchi, 2007) did not show statistically signi f cant changes in depression.

For emotional well-being, no signi f cant differences were found in terms of purpose of life and feelings of usefulness between the intervention and control groups in one quantitative study for a structured volunteering intervention by older adults (George, 2011), while more positive f ndings were reported in terms of self-worth, relationships, and purpose in life from narrative interviews (George, Whitehouse, & Whitehouse, 2011). It was found that non-verbal communication such as touching was more frequent observed in the presence of children in studies looking at structured volunteering interventions (George, 2011; George, Whitehouse, & Whitehouse, 2011). In addition, Montessori-based teaching activities also showed positive impacts on the social participation of older adults with dementia in terms of the increased number of older people who successfully completed their sessions with children over time (Camp, Judge, Bye et al., 1997).

## DISCUSSION

Most studies showed bene f cial effects on cognitive functioning, engagement style, quality of life, psychological health and emotional well-being. However, mixed results were found for depression. For example, in one Irish randomised controlled trial (O'Shea, Devane, Cooney et al., 2014), the authors mentioned this was partly attributable to one outlier in the control group drawing the average up too much. There were wide variations across different residential care facilities. The authors were unable to demonstrate the bene f ts of the intervention for older people who had sub-clinical threshold levels of depression. It suggests a targeted approach would have bene f ted more people with a clinical diagnosis of depression. The capacity to bene f t was much greater for people with clinically meaningful levels of depressive symptoms than those with sub-threshold levels. Interestingly, when depression was measured using the Cornell Scale for Depression in Dementia (CSDD), there was a signi f cant improvement in the control group due to one site reporting an extraordinary improvement in depression among controls. After excluding this outlier from the analysis there was no signi f cant impact on depression. The authors mentioned this should be interpreted with caution.

One of the common factors that emerged from successful cross-