Rehabilitation in dementia: CST and Sonas group interventions for people with moderate cognitive impairment. A pilot study

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Abstract

Purpose – Dementia is a complex, progressively degenerative condition. It results in loss of cognitive and functional capabilities, along with a significant increase in the level of dependency. A reduction in the use of pharmacological interventions correlates with an increased in good quality non-pharmacological interventions in dementia care. The purpose of this study is to examine the impact of 14-session face-to-face cognitive stimulation therapy (CST) and Sonas group interventions on individuals living with dementia with moderate cognitive impairment, from pre-intervention to post-intervention in terms of their cognition, communication, neuropsychiatric symptoms, activities of daily living and quality of life.

Design/methodology/approach – A pilot single blind prospective controlled trial evaluated two group intervention approaches, cognitive stimulation therapy (CST) and Sonas, with 28 participants with moderate dementia. Pseudorandomisation and single blinding were implemented. CST has a solid evidence base. Sonas is a widely used multi-sensory intervention in Ireland with an emerging evidence base. Participants were recruited from a mental health service. Participants who had a formal diagnosis of dementia, moderate cognitive impairment and some ability to communicate and understand communication were included.

Findings – Results supported CST to a greater extent than Sonas. The CST group showed significant changes in cognition (p = 0.032) and communication (p = 0.006). Both groups had significant changes in carer quality of life (CST, p = 0.019; Sonas, p = 0.035). Results support the recommendations for a future definitive trial.

Research limitations/implications – Rehabilitation potential of individuals living with moderate dementia was demonstrated. This study suggests that group interventions like these impact on the trajectory of dementia.

Practical implications – Rehabilitation interventions impact on the trajectory of dementia. CST and Sonas have no impact on activities of daily living. Future studies with larger sample sizes, 16 weeks intervention period and control groups are required.

Social implications – This pilot study supports CST over Sonas interventions for individuals living with moderate dementia. Multiple outcome measures demonstrated trends towards significance for both interventions. Future definitive trials may detect a significant effect of both interventions.

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Originality/value – A dementia diagnosis is devastating and generally creates negative perceptions and associations (Alvira, 2014). In contrast, the outcomes of this study are positive. This study provides evidence that occupational therapist intervention can impact on the trajectory of the condition with people with dementia demonstrating that they do have rehabilitation potential by responding to treatment and improving and maintaining their abilities as they progress through the condition.

Keywords Rehabilitation, Dementia, Occupational therapy, Cognitive stimulation therapy, Sonas

Paper type Research paper

Introduction

The demographic and health profiles of populations have undergone a dramatic change worldwide. People now live longer and age with disabling chronic conditions that influence their functioning and well-being (WHO, 2015). In Ireland, the number of people with dementia is estimated to rise from an estimated 41,447 in 2006 to 147,000 in 2041 (Cahill *et al.*, 2012). Approximately 47 million people worldwide are estimated to have dementia and the incidence is reported to be 9.9 million cases per year (Prince *et al.*, 2015). Internationally, the World Health Organisation recognises dementia as a pending international epidemic (ADI, 2009). This has prompted urgency in the development of rehabilitation interventions to slow decline or prevent dementia (Verghese, 2015). There has been an increase in good quality research to support non-pharmacological interventions (Woods *et al.*, 2012), and this has coincided with a reduction in pharmacological interventions in the treatment of dementia (Spector *et al.*, 2008).

Cognitive stimulation therapy (CST) and Sonas are two manualised group interventions for individuals living with dementia. CST is suitable for those with mild to moderate impairment and Sonas is suitable for those individuals with moderate to severe impairment (Dolan and Shiel, 2017).

CST sessions aim to stimulate and engage people with dementia, whilst providing an optimal learning environment and the social benefits of a group (Spector *et al.*, 2011). CST is a 14-session programme with a well-established evidence base and an associated maintenance programme (Spector *et al.*, 2003). The first randomised controlled trial (RCT) of this manualised intervention programme involving 201 participants with mild-to-moderate dementia, reported significant improvements in cognition and quality of life outcomes, which compared favourably with trials of cholinesterase inhibitors (Spector *et al.*, 2003). Individualised CST (iCST) is also available (Yates *et al.*, 2014). In a large-scale RCT involving 356 individuals, there was no evidence that iCST has an effect on cognition or quality of life (QoL) for people with dementia but that participating in iCST appeared to enhance the quality of the care giving relationship and caregivers' QoL. (Orrell *et al.*, 2017). Virtual CST is now available in the context of COVID-19 where groups are no longer meeting physically as they used to. This consists of group CST, following the standard 14-session manual via an online platform relevant to the organisation (Spector, 2020).

Sonas is a multisensory stimulation intervention but is not completed in a specific multi-sensory environment. It is described as a system to assist people in realising whatever potential they have through cognitive, sensory and social stimulation that includes all five senses: touch, smell, taste, hearing and sight (Jones *et al.*, 2004; Strøm *et al.*, 2018). Until recently, Sonas lacked an evidence base yet was implemented widely in Ireland (Hutson *et al.*, 2014). Hutson *et al.*, (2014) found in their RCT that Sonas does not have any therapeutic benefit in terms of QoL or behavioural and psychological symptoms of dementia. In contrast, Strøm *et al.* (2018) found that communication abilities increased with the time of the intervention in the Sonas programme among nursing home residents with moderate-to-severe dementia. As an outcome of her study, Strøm recommended an intervention period of a maximum of 16 weeks. Sonas also has an individualised programme (Sonas individual multi-sensory session) which lacks an evidence base at present (Engaging Dementia, 2021).

The literature review established a poor evidence base for the use of Sonas group sessions outside of communication as an outcome measure with participants who have moderate-to-severe cognitive impairment. In spite of this lack of evidence, there is a high level of popularity, training and use of Sonas as reported from the Sonas aPc organisation (Sonas aPc, 2011). A good evidence base for the use of CST group sessions in dementia care in the mild-to-moderately impaired participant was also identified. To date, CST has not been compared to any other non-pharmacological treatment for dementia. CST has not been evaluated based on the severity of the cognitive deficits. It has been evaluated in terms of mild-to-moderate cognitive impairment but not for each cognitive stage individually. This study compared the CST and Sonas group interventions for individuals in the moderate stages of dementia and built on the robust CST and emerging Sonas evidence base. It provided an evaluation into what is considered the most suitable intervention for an individual who lives with moderate dementia in Ireland.

The research questions were:

RQ1. What impact does 14-session face-to-face CST and Sonas group interventions have on individuals living dementia with moderate cognitive impairment, from pre-intervention to post-intervention in terms of their cognition, communication, neuropsychiatric symptoms, activities of daily living (ADLs) and quality of life?

RQ2. In relation to quality of life, what are the differences between CST and Sonas group interventions' total quality of life in Alzheimer's disease scale (QoL-AD)

scores, participant rated scores and carer rates scores in both groups?

Methods

Design

A single blind prospective controlled trial was used. Participants were assessed pre- and post-intervention.

The study was led by an occupational therapist (OT), in conjunction with a psychologist in clinical trainings parallel study entitled, "An evaluation of the efficacy of Cognitive Stimulation Therapy and Sonas group interventions for people with moderate dementia", and examined specifically cognitive function. Both studies used the standardised mini-mental state examination (SMMSE) as an outcome measure but there were no other overlaps. This publication reports both studies, hence the rationale for the detailed cognitive testing.

Ethics

Ethical approval for the study was obtained from the Research Ethics Committee, HSE – Midland Area in 2014.

Participants

Participants were recruited from a Psychiatry of Later Life (PLL) mental health setting in Ireland. Inclusion criteria for recruitment were:

- a formal Diagnosis of Dementia of any type according to the DSM V 2013 criteria (American Psychiatric Association, 2013);
- moderate cognitive impairment as classified by the SMMSE (Molloy *et al.*, 1991), score ranging from 10 to 20; and
- some ability to communicate and understand communication, determined by a score of 1 or 0 on questions 12 and 13 of the Clifton Assessment Procedures for the Elderly-Behaviour Rating Scale (Pattie and Gilleard, 1979).

Exclusion criteria were:

- a score of <10 or >20 on the SMMSE (Molloy *et al.*, 1991);
- inability to communicate and understand communication;
- significant physical health problem or illness;
- exposure to CST or Sonas in the six months prior to the study;
- had a sensory impairment;
- significant uncontrolled disruptive behaviours;
- a premorbid diagnosis of a learning disability;
- a recent onset of a depressive episode or acute anxiety; and
- a change of antipsychotic and/or antidepressant medication in the month or the addition of benzodiazepines during the prior to recruitment.

A total of 570 participants were screened for suitability for inclusion. This comprised of PLL inpatients (n = 40), community-dwelling patients (n = 460) and those attending a care centre (n = 70). Twenty-eight participants were recruited from three sites, two inpatient sites and one community. Written informed consent was obtained from all participants.

Instrumentation

Generic cognitive functioning was assessed using the SMMSE (Molloy and Standish, 1997). It is a reliable tool, which was amended from the original MMSE that provides strict guidelines for administration and scoring (Molloy *et al.*, 1991). The estimated percentage diagnostic accuracy is excellent, original MMSE (0.90) and SMMSE (0.94). The SMMSE demonstrates equivalent reliability when administered in the clinic or the participants' home (Bédard *et al.*, 1995). It takes an average time of 10.5 min to administer (Molloy and Standish, 1997). In this study, the SMMSE was administered as a screening tool to meet the inclusion/exclusion criteria where a recent assessment was not present within the clinical chart. It was administered within two weeks pre and two weeks post the treatment phase of the study by an assessor who was blind to which group the participants were attending.

Cognition was assessed using The Repeatable Battery for Assessment of Neuropsychological Status (RBANS; Randolph, 1998). The test has good reliability, with split half reliability with individual index scores ranging from 0.82 for the language index to 0.88 for the immediate memory index (Randolph, 1998). It consists of 12 subtests which assess five cognitive domains: immediate memory (list learning, story memory), visuospatial-constructional ability (figure copy, line orientation), attention (digit span, coding), language (picture naming, semantic fluency) and delayed memory (list recall, list recognition, story memory, figure recall).

Language comprehension was assessed using the Token Test (TT). The TT has also been reported to have good reliability and discriminative validity (Strauss *et al.*, 2006).

The Verbal Fluency subtest of the Delis-Kaplan Executive Function System (DKEFS) test was used for this study. The DKEFS tests display moderately good internal consistency coefficients, as well as good test–retest reliability (Delis *et al.*, 2001).

The Wechsler Adult Intelligence Scale (WAIS) Digit Span Forwards and Backwards were used to assess attention (digits forwards) and auditory working memory (digits backwards). Data collected on the WAIS-III Digit Span subtest confirms the measure's reliability and validity (Wechsler, 1997).

ADLs were assessed using a dementia specific rating scale of ADL function known as the Alzheimer's Disease Cooperative Study Activities of Daily Living (ADCS-ADL) assessment (Galasko *et al.*, 1997). Both sensitivity and reliability have been established, and it has comparison data, good test–retest reliability and is sensitive to dementia (Galasko *et al.*, 1997).

Communication was assessed using the Holden Communication scale (Holden and Woods, 1995). It is recommended for serial assessments and has been shown to be sensitive to changes brought about by reality orientation (Brewer, 1984). There are limitations to the validity and reliability data outside of the original development of the tool, therefore limiting its strength (Dolan and Shiel, 2017).

QoL was assessed using the QoL-AD. The scale obtains separate ratings of the individual's QoL from the participant and the caregiver. The QoL-AD has been found to have an

internal reliability of 0.94 and a one-week test–retest reliability coefficient of 0.76 (Logsdon *et al.*, 1999). Internal consistency of the scale is also noted to be good (Burns *et al.*, 1999).

Neuropsychiatric symptoms were assessed using two versions of the Neuropsychiatric Inventory (NPI): the NPI-Q for the community group and the NPI-NH for the inpatient groups. The NPI-Q and the NPI-NH version of the NPI has been developed and cross-validated with the standard NPI in clinical practice settings (Cummings, 1994). The NPI has been shown to have adequate test–retest and inter-rater reliability (Cummings, 1997; Cummings, 1994; Woods *et al.*, 2012).

Sample size

Sample size was calculated using formal power analysis, G*Power software (Faul *et al.*, 2007). Two-tailed alpha of 0.05 was assumed for all tests. Based on Cohen's (1988) guidelines for small ($r = 0.1$), medium ($r = 0.3$) and large ($r = 0.5$) effects, for a 2 (pre- and post-test) × 2 (CST and Sonas) *t*-test, with the difference between two dependent means (matched pairs), with an estimated effect size of 0.80, and with a 0.05 (two-tailed) level of significance, a sample size of 34 is required with a critical t of 2.034515 and degrees of freedom 33 equals actual power of 0.807778. Twenty-eight participants of whom 25 completed all assessments were included in this study.

Randomisation and masking

Random allocation was planned but, for logistical reasons, this proved impossible. In the care centre site, random allocation was completed by a clinical psychologist otherwise uninvolved in the study using a computer-generated number system (RANDBETWEEN Command on Microsoft Excel). Pseudo randomisation on a group basis was used in the long stay inpatient PLL site with a ward group of individuals randomly allocated to either CST or Sonas conditions. This was completed by the same clinical psychologist by tossing a coin (Head = Treatment A CST, Tail = Treatment B Sonas). Finally, convenience allocation was used for the community group. Single blinding was also applied in that the assessors were blind to the group allocation.

Intervention

Both CST and Sonas groups are manualised programmes. The sessions were completed twice a week on two separate days in both inpatient sites. The sessions were completed consecutively with an appropriate break in the community site.

All group sessions across the three sites delivered by a senior OT with the relevant training. Environmental conditions in all settings were similar, and both interventions were carried out in therapeutic group rooms within the relevant settings. Both groups adhered strictly to the relevant manual, and there were no more than seven participants in a group at any one time.

Data analysis

The data were tested for normality and if normally distributed, parametric analysis was used. Where they were not normally distributed, non-parametric analysis was used.

Both a between-group analysis to examine if the groups were significantly different at outcome and a within-group analysis (i.e. pre-intervention T1 to post-intervention T2) to evaluate if there were significant changes within groups were used.

Significance levels were set at 0.05. Parametric tests used were the *t*-test (t), ANOVA (F) and Pearson correlation coefficient (rho). Non-parametric tests used were the Mann–Whitney U test (U), the Wilcoxon signed rank test (W), the Kruskal–Wallis test (K) and the Spearman's rank order correlation (rho).

Results

Fifteen participants were allocated to CST and 13 participants to Sonas intervention. There were 11 males and 17 females. Seven males and eight females attended CST and four males and nine females attended Sonas. The mean age of the participants was 80.29 years, SD 7.57.

General cognitive functioning

Standardised mini-mental state examination

Between groups: An independent samples *t*-test was used to examine the differences in mean score between groups on the post SMMSE scores; there were no differences between CST and Sonas Groups [t (26) = 1.332, p = 0.195, NS] on post assessment.

Within groups: On comparison of pre-test (T1) and post-test (T2) SMMSE scores across both the groups using a split file paired samples *t*-test a statistically significance difference was observed in the CST group only [t (14) = −2.385, p = 0.032] in comparison to the Sonas group [t (12) = −1.923, p = 0.079, NS].

Language

Token test

Between groups: There was no significant difference between the two groups on Time 2 scores, F (1, 22) = 0.27, p = 0.608, partial $\eta^2 = 0.012$.

Within groups: There was a significant difference in TT scores from T1 (M = 116.62, SD = 30.62) to T2 (M = 124.77, SD = 31.94), (12) = −2.67, p = 0.012, p = < 0.01 for the CST group, indicating a medium effect size (0.37). There was no significant difference for the Sonas group from Time 1 (M = 73.58, SD = 28.21) to Time 2 (M = 80.42, SD = 29.87), t (11) = −1.518.

Delis-Kaplan Executive Function System verbal fluency

Between groups: A Mann–Whitney U test was used to evaluate between-group differences. The difference in the post-intervention scores on the DKEFS Verbal Fluency test between the CST (Md = 11, N = 13) and Sonas group (Md = 8, N = 12) was significant, U = 42.00, z = −1.97, p = 0.049, r = 0.08.

Within groups: The CST group showed an improvement in scores from pre-intervention (M = 12.85, SD = 6.02) to post-intervention (M = 13.92, SD = 7.59). Scores for the Sonas group disimproved from pre-intervention (M = 8.00, SD = 4.30) to post-intervention (M = 7.92, SD = 4.62).

There were no significant differences between groups on the RBANS (W = 0.96, z = −1.21, p = 0.225, NS). There were no significant differences on any of the measures related to memory and attention (WAIS Digit Span Forwards Test p = 0.343, NS), (WAIS backward w = 0.92, p = 0.161, NS) or for the ADCS-ADL scale (U = 99.000, p = 1.000, NS).

Quality of life

Between groups: A Mann–Whitney U test was used to examine differences between CST and Sonas groups. There were no statistically significant differences on post-assessment total score, $U = 92.000$, $p = 0.8207$, NS.

Within groups

Wilcoxon signed rank test was used to examine differences in total pre-post QOL scores. The CST group demonstrates a trend towards significance ($W = 63.000$, $Z = 1.888$, $p = 0.059$, NS), and there was no difference for the Sonas group ($W = 55.500$, $Z = 1.296$, $p = 0.195$, NS). On examination of patient rated scores, through a related samples Wilcoxon signed rank test, there were no significant differences but on the Carer rated QoL-AD scores, both CST groups ($W = 79.000$, $Z = 2.344$, $p = 0.019$) and Sonas groups ($W = 2.104$, $Z = 56.500$, $p = 0.035$) improved significantly.

Communication

Between groups: A Mann–Whitney U test demonstrates no differences between CST and Sonas groups on post-assessment total scores $U = 127.000$, $p = 0.1846$, NS.

Within groups: On the Holden Communication scale significant improvements were found in the CST groups only ($W = 6.500$, $Z = -2.736$, $p = 0.006$) and the Sonas group was found not to be statistically significant ($W = 17.500$, $Z = -1.391$, $p = 0.164$, NS).

Neuropsychiatric symptoms

Between groups: A Mann–Whitney U test found that there were no differences between CST and Sonas groups on total NPI post-assessment scores, $U = 88.000$, $p = 0.6832$, NS. There were no statistically significant differences between groups on the individual components of the post NPI assessment.

Within groups: There were no statistically significant differences between the CST ($W = 21.5$, $Z = -1.951$, $p = 0.051$, NS) or Sonas ($W = 12.0$, $Z = -1.871$ $p = 0.061$, NS) groups on this assessment. Both groups show a trend towards significance. On examination of the individual components of the NPI assessment the CST group had statistically significant changes between pre- and post-assessment in the areas of depression/dysphoria ($W = 0.0$, $Z = -2.060$, $p = 0.039$); occupational disruptiveness ($W = 2.0$, $Z = -2.459$, $p = 0.014$) and appetite and eating changes ($W = 0.0$, $Z = -2.459$, $p = 0.014$). The Sonas group had no significant changes.

Discussion

CST and Sonas are person-centred psychosocial interventions suitable for people in the moderate stages of dementia. The results of the study show that both of these interventions can result in benefits for indivdiuals who live with dementia with particular improvements for the CST group in language and communication.

Dementia is a degenerative condition. Therefore, changes in cognition were not expected. Maintenance in cognitive functioning is a positive outcome for OTs working in this field of practice, and there were no differences in outcome between the treatment groups. However, there were differences within groups; the participants assigned to the CST group had statistically significant changes in SMMSE scores changing from a mean 16.53 to 18.27 points with a mean 1.74 point increase in post SMMSE scores. Whilst the Sonas group did not show a statistically significant change, they did demonstrate an improvement in scores by 1.08, which is more than just maintenance of cognitive function. The change is considered clinically significant given the progressive deteriorating nature of the condition.

Practice effect was considered. The SMMSE is the most widely used screening test for cognitive function for older adults (Molloy *et al.*, 1991). However, should a practice effect explain the outcome of the SMMSE it would be expected that this would be the case in both groups. The statistically significant outcome was on the CST group alone discounts this theory of a practice effect. This finding on the SMMSE is similar to that of Spector (2003) where the mean group differences between the CST treatment group and the control group in Spector's work was +1.14. Similarly, Aguirre *et al.* (2010) who investigated which factors may predict response to CST also found statistically significant changes on SMMSE with a pre mean score of 15.8 to a post score of 18.5, indicating a 2.7 point change which was statistically significant.

Spector *et al.* (2011) suggest that for the CST programme, changes in outcome measures may be partially because cognitive stimulation (CS) involves a more general approach whereby cognitive functions such as memory are not used in isolation. These functions are integrated with other functions such as language, attention and executive functioning. This is achieved through various activities from week to week such as games, quizzes and reality orientation. There is also active engagement between participants in these components of the group sessions. This may explain the reasons for the change in the CST group only in this study on the SMMSE and the measure of language comprehension (TT).

The Sonas group does not offer this level of active component in its approach. Sonas adopts a sensory approach; it relies on structure, and repetition, which fostered familiarity to the programme. Participants are facilitated in giving a contribution to the group in one section on the programme and they may naturally engage with others in the group, there is less facilitated active engagement with other participants through activities in the Sonas approach and less opportunity for active stimulation of attention and executive functioning through activities. The CST group was found to have the greatest impact on the participants' cognitive functioning as measured by the SMMSE and communication as measured by the Holden communication scale. Clinically, this is significant and this CST group approach is the more suitable of the two interventions to target cognitive functioning.

One longitudinal secondary descriptive study published by Strøm *et al.*, (2018) on the Sonas programme suggested that communication abilities increased with individuals with moderate-to-severe dementia as the length of time increased with the peak reached at 16 weeks (Strøm *et al.*, 2018). This outcome suggests that the peak improvements in communication using the Sonas programme may be seen after 16 weeks, whereas with the CST programme improvement is seen after seven weeks. Strøm *et al.*'s study could explain the findings of this research in terms of the overall greater improvement for the CST group. In addition, it suggests that

for those individuals with moderate impairment CST could be the most time efficient way of achieving outcomes. This is particularly relevant when working within the resource demands of health-care services. Strøm *et al.*'s study included only individuals with moderate impairment, but future studies comparing Sonas to other interventions should consider this length of intervention time when designing their research.

Randomisation

This is the first prospective controlled study comparing these two interventions completed with this population. However, this design did not use full randomisation, which threatens the internal validity of the study, as selection bias could have been present. There was a low attrition rate in this study; this was attributed to the strict inclusion/exclusion criteria.

Sample size

Another study limitation is the sample size. Power analysis initially identified a sample size of 34 required to achieve 80% power. Twenty-eight participants, of whom 25 completed the study, were recruited. The implication of this is that Type 2 errors may be present with the study failing to detect an effect that is actually present. For example, the Sonas group SMMSE and both group NPI total scores score change shows a trend towards significance. Therefore, future studies with larger sample sizes are required.

Control group

The lack of a control group is a limitation. This would have been a valuable comparison in order to discuss the potential Hawthorne effect in the study. The issue of respondent burden is considered given the large number of tests in the context of the combined OT and psychology parallel studies. Pre- and post-assessments were conducted over a number of sessions (minimum of 2) to reduce the risk of tiredness participants may have experienced. It took participants approximately 1.5 h both pre and post to complete all the assessments related to the study.

Mechanisms for change in the group sessions

CST and Sonas group sessions provided an optimal learning environment for individuals who live with dementia, (Spector *et al.*, 2003). In both groups, there were specific consistencies that led to familiarity for the participants. The lead therapist and assistants were consistent throughout the programme, the time, location was consistent and the environmental setup was consistent.

The role of stimulation within the group itself is considered to have potentially influenced findings; with the power of the therapeutic relationship formed with the OT facilitating the groups and the response to the presence of other peers in the group considered (Stein and Taliant, 1988).

Recommendations for future research

Activities of daily living

No significant differences were found in ADLs for either group. Spector *et al.* (2011) reported an improvement in alertness and concentration following CST. There was also a consensus that participants were engaging in more activities such as "personal care, conversations and watching television" (Spector *et al.*, 2011, p. 948).

The findings of this study support the findings of Aguirre *et al.* (2010) who also used the ADCS-ADL scale in their study on CST in dementia and found no statistically significant changes in ADL because of CST. This study is similar to those in four other studies examined in a Cochrane review "Cognitive stimulation to improve cognitive functioning in people with dementia (Review)" that evaluated CS in terms of ADL and found no statistically significant outcomes in four studies, involving 160 participants (Woods *et al.*, 2012).

As OTs with a focus on occupational performance and ADLs, future studies need to consider if the language and cognition outcomes are sufficient to warrant the use of the OT's time in such groups. It is suggested that the OT role may be considered important as a MDT co-facilitator of CST or Sonas in a service but not a primary focus of the profession.

OTs needs to consider similar group interventions such as ADL focused CS rehabilitation interventions with people with MCI and dementia. Jiménez Palomares (2021) conducted a pilot randomised controlled trial on the effects of a cognitive rehabilitation programme on independence in performing ADL with 58 participants over 60 years of age with dementia. The results found improved scores in the Barthel assessment, showing a significant improvement (p = 0.006) for those allocated to an OT CS ADL based program in comparison with a group receiving conventional OT for management of ADL deficits who showed a deterioration. No statistically significant differences in cognition were found in the treatment group of this study. This contrasts with the evidence base for CST research which demonstrates statistically significant differences in cognition but no changes for ADLs (Spector *et al.*, 2003). Future studies should examine whether CS or CST interventions are more effective when used as part of an ADL-focused, multi-faceted intervention.

CST and Sonas interventions appear to target different areas in their approaches. It is argued that there is a place for both interventions in clinical practice. Future studies, especially those evaluating Sonas should examine the areas targeted by Sonas in more detail and research Sonas in those participants with severe cognitive impairment, which was outside of the scope of this study.

Environmental stimulation

A baseline level in each site of residence should have been completed. This should have include the details of the activity programmes running regularly in each site and the natural environment stimulators. These factors have potential to influence the outcome and need to be captured in future studies.

Routine

This study supported the use of routines in its organisation of groups and individual sessions. A robust evidence base for the use of routines in dementia care is not present (Zisberg, 2007). Future studies should examine the impact of routines on occupational performance in participants with dementia.

Key points for occupational therapists

- Rehabilitation interventions influence the trajectory of dementia.

- CST and Sonas have no impact on ADLs.
- Future studies with larger sample sizes, 16 weeks intervention period and control groups are required.

What the study has added

This pilot study supports CST over Sonas interventions for individuals living with moderate dementia. Multiple outcome measures demonstrated trends towards significance for both interventions. Future definitive trials may detect a significant effect of both interventions.

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