

Original Research Article

# Impact of the Sonas Programme on Communication over a Period of 24 Weeks in People with Moderate-to-Severe Dementia

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## Keywords

Communication · Dementia · Elderly · Sonas programme

## Abstract

**Objectives:** The primary aim was to examine how communication abilities changed over time among nursing home residents with moderate-to-severe dementia who were attending the Sonas programme and to explore whether changes in communication abilities were related to cognitive ability. **Method:** A longitudinal secondary descriptive study method was employed, where 56 people with moderate-to-severe dementia attended a 45-min Sonas group session twice a week for 24 weeks. The Threadgold Communication Tool (TCT) was completed every 4 weeks. **Results:** The impact of the Sonas programme on communication showed a significant non-linear trend in the TCT, with an increase in communication abilities during the first 16 weeks, regardless of the level of the residents' cognitive abilities. Thereafter it levelled out. No interaction was found between time and the frequency of attendances at Sonas sessions. Both verbal and non-verbal communication increased from the baseline, with non-verbal communication increasing quickly and verbal communication increasing marginally. **Conclusion:** Communication abilities increased with the time of the intervention, but the peak was achieved after 16 weeks, after which the effect levelled out. This suggests that the Sonas programme should be used for a period of at least 16 weeks before evaluating its effect.

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## Introduction

Communication is considered to be a basic human need [1] and can help a person to preserve a sense of identity, preventing loneliness, depression, and anxiety [2] and helping to build relationships [3]. For people living with dementia, language, speech, and non-verbal communication impairments are common symptoms [4], and since language, speech, and non-verbal communication are “cognitive processes for sharing information” [5], communication problems will increase over time and with the degenerative process of dementia [6]. It is also well known that people living with dementia are at risk of being marginalized by society [7] and depersonalized [8] due to communication difficulties. However, there is evidence that people with dementia, even those with severe dementia, do not completely lose their abilities to communicate non-verbally. They are still able (in some way) to produce meaningful communication by expressing their needs, wants, and desires through non-verbal behaviours [9]. Kitwood [10] even suggested that well-being in people with severe dementia could be improved through successful collaborative communication, where, for example, the carer provides extra time to give the person the opportunity to communicate non-verbally in a meaningful way.

### *The Use of Sensory Stimulation for People Living with Dementia in Care Homes*

For persons with chronic diseases such as severe dementia there is a treatment goal shift from prolonging life towards palliative care, with the aim of optimizing quality of life, dignity, and comfort [11–14]. So far there has been no cure for dementia, and therefore psychosocial interventions are recommended to help a person living with dementia to cope with behavioural and psychological symptoms of dementia and improve their quality of life [15, 16]. The importance of offering meaningful psychosocial interventions is confirmed both by people living with dementia and by their families and care staff as a way of providing person-centred care [17]. However, residents, staff, and family can have a different view of what they consider as meaningful. Residents experienced activities that addressed their psychosocial and social needs as meaningful, whereas staff and family viewed activities that maintained the person’s physical abilities as meaningful [18].

A range of psychosocial interventions have been used with people with dementia [19, 20], including several that involve sensory stimulation. Sensory stimulation interventions such as music, light therapy, acupressure/reflexology, massage/aromatherapy, and doll therapy/pet therapy/toy therapy all refer to different techniques used to stimulate one or more of the five human senses with the overall aim of increasing alertness and reducing agitation [21]. However, communication has seldom been the main outcome of intervention programmes. Most often, the effect on behavioural symptoms has been the main outcome [22].

The Sonas programme, which is a multi-sensory stimulation programme, was developed by Mary Threadgold RCS (Religious Sisters of Charity) in 1990 and involves cognitive, sensory, and social stimulation that includes all five senses: touch, smell, taste, hearing, and sight. The aims of the Sonas programme are: (1) to activate whatever potential for communication has been retained by an older person with communication impairment, (2) to encourage the creation of an environment which will facilitate communication, and (3) to have activation of the potential for communication recognized and accepted as an essential part of care planning for older people [23].

Of the six published studies of the Sonas programme, only three have explored the effect on communication [24–26]. However, none of these studies have explored the immediate impact of the Sonas programme on communication during the Sonas sessions or used the Threadgold Communication Tool (TCT) to assess communication ability.

**Fig. 1.** The various elements of the Sonas programme.

- The programme consists of the following elements:
- Signature tune and greeting song
  - Exercises to music
  - Smell
  - A "sing-along" which includes three familiar songs
  - Relaxation music/massage (the senses of taste and touch are stimulated)
  - Music with percussion instruments
  - Joining in proverbs
  - Listening to poetry
  - Contribution
  - Second "sing-along"
  - Closing song and signature tune

The primary aim of the study was to examine how the communication abilities of nursing homes residents who had moderate-to-severe dementia changed over time as they participated in a 24-week implementation of the Sonas programme. Another aim was to explore whether there was any relationship between changes in communication abilities and the cognitive abilities of the residents as well as other aspects of communication.

## Method

The study was a longitudinal secondary descriptive study with data partly obtained from another study [25] conducted on people with moderate-to-severe dementia who were living in nursing homes in Ireland. In addition to the controlled trial, we added data from one nursing home that had not participated in the aforementioned study.

Data collection was carried out at baseline, which was immediately after the completion of the first Sonas session (T0). The other assessments were carried out after 4 weeks (T1), 8 weeks (T2), 12 weeks (T3), 16 weeks (T4), 20 weeks (T5), and 24 weeks (T6), all immediately after the Sonas sessions, based on observations made during the sessions.

### *Setting and Sample*

A convenience sample of 56 persons with moderate-to-severe dementia – as classified by Mini-Mental State Examination (MMSE) scores between 0 and 20 – living in seven different nursing homes in Ireland was recruited. The study took place over a period of 24 weeks and the participants were recruited between January and March 2014. Residents were considered eligible to participate if they were more than 65 years of age, spoke English, and were living in the nursing home on a permanent basis. Persons at the end-of-life stage, those with major depression, those with current or partial remission, and those that had been exposed to previous Sonas sessions were not included. The study took place from April to October 2014.

### *Intervention*

The Sonas programme was carried out twice a week over a period of 24 weeks. Each session lasted 45 min and was conducted in 7 groups with 8 residents in each. A person trained by Sonas apc to deliver the Sonas programme (termed a Sonas Licensed Practitioner) and an assistant led the sessions. The programme consists of 11 elements and follows the same structure each time, in the belief that repetition is a way of helping the individual to remember [23]. The participants are seated in a semicircle and the session begins with a welcome song where each one is individually greeted by name. The textbox shows the various elements of the Sonas programme (Fig. 1).

### Assessments

The TCT, which measures communication abilities, was the main outcome measure. The TCT is a proxy-based instrument designed to assess communication abilities in persons with dementia after attending a Sonas session. The TCT consists of 14 items, and each item is graded from 0 to 4, from no evidence to frequent evidence of communication [23]. A psychometric evaluation of the TCT concluded it to be a valid instrument, suitable for measuring communication among people with dementia [27]. Assessment with the use of the TCT was performed at baseline and thereafter every 4 weeks, carried out by the Sonas Licensed Practitioners immediately after the Sonas session.

The nurses collected the residents' demographic data from medical records and nursing records at baseline. The degree of cognitive dysfunction was assessed by the MMSE. The questionnaire comprises 20 questions that cover orientation, memory, reading and calculation, recall, and language. Each question is scored, and the sum score can vary between 0 and 30. A higher score denotes better cognition [28]. The MMSE has been found to have satisfactory reliability and construct validity [29]. The instrument was used by the nurses before the first Sonas session as an inclusion criterion and thereafter at 12 and 24 weeks.

### Analysis

The participant characteristics are described as means and standard deviations (SD) for continuous variables and as frequencies and percentages for categorical variables. To assess a profile in TCT score throughout the follow-up period, a linear mixed model with fixed effects for time up to second-order and random effects for residents nested within nursing homes was estimated. To test whether the number of sessions attended was associated with the time profile of the TCT, a model with the number of sessions attended and interaction between number and time was estimated.

The analyses were also stratified by moderate and severe dementia at baseline by estimating the same model with additional fixed effects for dementia status and interaction between dementia and time. A significant interaction would imply differences between those with moderate and those with severe dementia regarding the time profile of the TCT.

A trend model for verbal and non-verbal communication components based on the two-component structure revealed during the psychometric evaluation of the TCT [27] was also assessed.

The analyses were performed in SPSS v24 and SAS v9.4. Results with  $p$  values  $<0.05$  were considered statistically significant.

## Results

### *Participant Characteristics and Attendance*

The mean age of the participants was  $86.8 \pm 7.0$  years, and the majority (85.7%) were women. They had a mean MMSE score of  $7.8 \pm 6.5$  and a mean communication ability (TCT score) of  $30.8 \pm 14.4$  at baseline. Of the participants, 33 had severe dementia and 23 had moderate dementia, according to the cut-off on the MMSE of 10/11 (Table 1).

The participants were reported to have attended the Sonas programme for an average of  $37.7 \pm 13.2$  sessions (range 0–48), and of the 56 participants assessed at baseline, 50 completed the study.

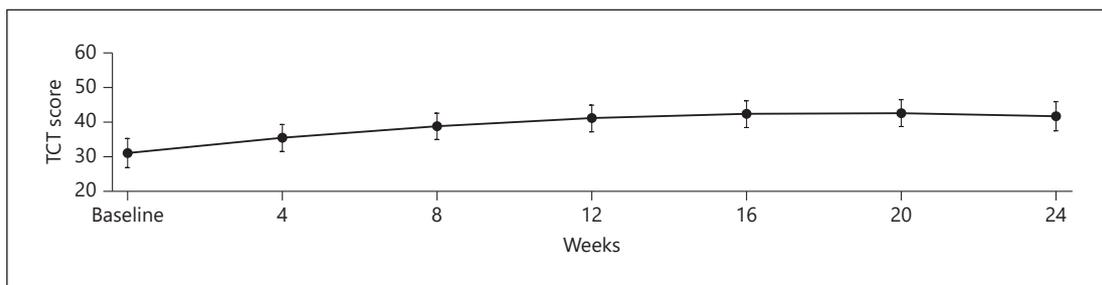
### *Impact of the Sonas Programme on Communication*

We found a significant non-linear trend in TCT score from baseline to 24 weeks (T6). The TCT score increased significantly from baseline to 16 weeks (T4), this effect ceasing after 16

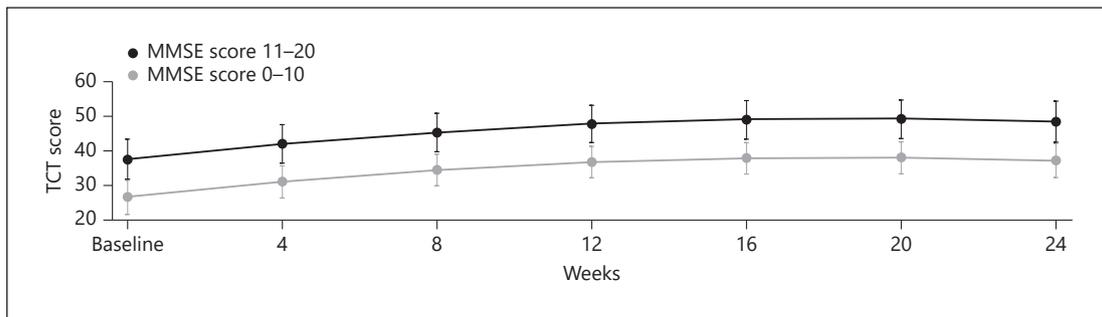
**Table 1.** Characteristics of the participants ( $n = 56$ )

Gender	
Male	8 (14.3)
Female	48 (85.7)
Degree of dementia	
Severe (MMSE score 0–10)	33 (59)
Moderate (MMSE score 11–20)	23 (41)
Age, years	86.8±7.0
MMSE score	7.8±6.5
TCT score	30.8±14.4

Values are presented as  $n$  (%) or mean ± SD. MMSE, Mini-Mental State Examination; TCT, Threadgold Communication Tool.



**Fig. 2.** Mean Threadgold Communication Tool (TCT) score during 24 weeks.



**Fig. 3.** Difference in mean Threadgold Communication Tool (TCT) score found between those with severe and those with moderate dementia. MMSE, Mini-Mental State Examination.

weeks, with a non-significant trend to a decrease in the last 4 weeks (Fig. 2). A significant difference in TCT was seen at most time points, but not at the observation points between weeks 16 and 24 (Table 2).

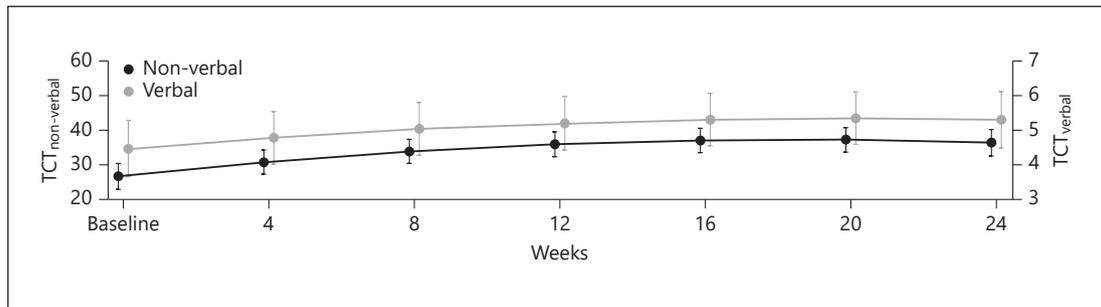
The interaction between the time and number of attendances was not significant, indicating that the time profile of the TCT is not affected by the number of attendances. However, an increasing number of attendances was associated with higher TCT scores, starting after 4 weeks ( $p = 0.035$ ) and getting stronger throughout the follow-up period ( $p = 0.009$  after 24 weeks).

As can be observed on Figure 3, a significant difference in communication ability was found between those with severe and those with moderate dementia at baseline ( $p = 0.002$ ). The difference remained significant at all six time points:  $p = 0.001$  at T1–T5, and  $p = 0.002$  at T6. Further, an increase in communication was seen for both groups, with a peak at 16 weeks, mimicking the profile of the total group of residents (Fig. 3; Table 2).

**Table 2.** *p* values of TCT scores

	TCT score			TCT score – cognitive ability			TCT score – verbal and non-verbal communication			
	mean difference (95% CI)	<i>p</i> value	MMSE score 11–20 mean difference (95% CI)	<i>p</i> value	MMSE score 0–10 mean difference (95% CI)	<i>p</i> value	verbal		non-verbal	
							mean difference (95% CI)	<i>p</i> value	mean difference (95% CI)	<i>p</i> value
T0 vs. T1	4.4 (3.3; 5.6)	<0.001	4.5 (3.2; 5.7)	<0.001	4.4 (3.2; 5.6)	<0.001	0.3 (0.1; 0.6)	0.009	4.1 (3.1; 5.1)	<0.001
T0 vs. T2	7.8 (5.9; 9.7)	<0.001	7.9 (5.6; 10.1)	<0.001	7.7 (5.7; 9.8)	<0.001	0.6 (0.2; 1.0)	0.005	7.2 (5.5; 8.8)	<0.001
T0 vs. T3	10.1 (7.8; 12.4)	<0.001	10.2 (7.3; 13.1)	<0.001	10.0 (7.5; 12.6)	<0.001	0.8 (0.3; 1.2)	0.002	9.3 (7.3; 11.3)	<0.001
T0 vs. T4	11.3 (8.9; 13.8)	<0.001	11.5 (8.1; 14.8)	<0.001	11.3 (8.4; 14.1)	<0.001	0.9 (0.4; 1.4)	0.001	10.4 (8.3; 12.6)	<0.001
T0 vs. T5	11.5 (9.0; 14.0)	<0.001	11.7 (7.9; 15.5)	<0.001	11.4 (8.3; 14.5)	<0.001	0.9 (0.4; 1.4)	<0.001	10.6 (8.4; 12.8)	<0.001
T0 vs. T6	10.7 (7.9; 13.4)	<0.001	10.9 (6.5; 15.3)	<0.001	10.5 (7.0; 14.1)	<0.001	0.8 (0.3; 1.3)	0.001	9.8 (7.4; 12.2)	<0.001
T1 vs. T2	3.4 (2.6; 4.1)	<0.001	3.4 (2.4; 4.4)	<0.001	3.3 (2.5; 4.2)	<0.001	0.3 (0.1; 0.4)	0.002	3.1 (2.4; 3.8)	<0.001
T1 vs. T3	5.7 (4.4; 6.9)	<0.001	5.7 (4.1; 7.4)	<0.001	5.6 (4.2; 7.1)	<0.001	0.4 (0.2; 0.7)	0.001	5.2 (4.1; 6.3)	<0.001
T1 vs. T4	6.9 (5.4; 8.4)	<0.001	7.0 (4.7; 9.3)	<0.001	6.9 (5.0; 8.7)	<0.001	0.5 (0.3; 0.8)	<0.001	6.4 (5.0; 7.7)	<0.001
T1 vs. T5	7.1 (5.3; 8.9)	<0.001	7.2 (4.3; 10.2)	<0.001	7.0 (4.7; 9.4)	<0.001	0.6 (0.2; 0.9)	0.001	6.5 (4.9; 8.1)	<0.001
T1 vs. T6	6.2 (3.7; 8.8)	<0.001	6.4 (2.6; 10.2)	<0.001	6.1 (3.0; 9.3)	<0.001	0.5 (0.04; 1.0)	0.032	5.7 (3.5; 7.9)	<0.001
T2 vs. T3	2.3 (1.8; 2.8)	<0.001	2.3 (1.6; 3.1)	<0.001	2.3 (1.7; 2.9)	<0.001	0.2 (0.1; 0.3)	<0.001	2.1 (1.7; 2.6)	<0.001
T2 vs. T4	3.6 (2.6; 4.5)	<0.001	3.6 (2.2; 5.1)	<0.001	3.5 (2.3; 4.7)	<0.001	0.3 (0.1; 0.5)	<0.001	3.3 (2.5; 4.1)	<0.001
T2 vs. T5	3.8 (2.2; 5.3)	<0.001	3.9 (1.6; 6.1)	<0.001	3.7 (1.8; 5.6)	<0.001	0.3 (0.03; 0.6)	0.032	3.4 (2.1; 4.8)	<0.001
T2 vs. T6	2.9 (0.4; 5.4)	0.023	3.0 (–0.4; 6.4)	0.080	2.8 (–0.1; 5.7)	0.058	0.3 (–0.2; 0.8)	0.285	2.6 (0.4; 4.8)	0.019
T3 vs. T4	1.3 (0.8; 1.8)	<0.001	1.3 (0.5; 2.0)	0.001	1.2 (0.6; 1.9)	<0.001	0.1 (0.01; 0.2)	0.032	1.1 (0.7; 1.6)	<0.001
T3 vs. T5	1.4 (0.2; 2.7)	0.023	1.5 (–0.2; 3.2)	0.080	1.4 (–0.1; 2.8)	0.058	0.1 (–0.1; 0.4)	0.285	1.3 (0.2; 2.4)	0.019
T3 vs. T6	0.6 (–1.8; 2.9)	0.625	0.7 (–2.2; 3.6)	0.648	0.5 (–2.1; 2.6)	0.700	0.1 (–0.4; 0.6)	0.704	0.5 (–1.6; 2.5)	0.639
T4 vs. T5	0.2 (–0.6; 1.0)	0.625	0.2 (–0.7; 1.2)	0.648	0.2 (–0.7; 1.0)	0.700	0.03 (–0.1; 0.2)	0.704	0.2 (–0.5; 0.9)	0.639
T4 vs. T6	–0.7 (–2.6; 1.2)	0.492	–0.6 (–2.8; 1.6)	0.592	–0.7 (–2.8; 1.3)	0.491	–0.01 (–0.4; 0.4)	0.959	–0.7 (–2.3; 1.0)	0.447
T5 vs. T6	–0.9 (–2.0; 0.3)	0.139	–0.8 (–2.1; 0.4)	0.201	–0.9 (–2.1; 0.3)	0.147	–0.04 (–0.3; 0.2)	0.737	–0.8 (–1.8; 0.2)	0.111

T0 = baseline, T1 = 4 weeks, T2 = 8 weeks, T3 = 12 weeks, T4 = 16 weeks, T5 = 20 weeks, T6 = 24 weeks. TCT, Threadgold Communication Tool; MMSE, Mini-Mental State Examination.



**Fig. 4.** Difference in mean Threadgold Communication Tool (TCT) score found between verbal and non-verbal communication ability.

Based on the two-factor solution (verbal and non-verbal communication found in the psychometric evaluation of the TCT [27]), we used the two subscores based on the factor analysis to explore the impact of the Sonas programme on verbal and non-verbal communication. The result shows that both aspects of communication ability increased from the baseline (Fig. 4). However, verbal communication abilities increased slightly and nearly linearly ( $p = 0.119$  for the second-order time component), while non-verbal communication improved rather quickly from baseline to 16 weeks, then levelled out and marginally disimproved towards 24 weeks (Fig. 3), with this pattern mimicking the profile of the total TCT (Table 2).

## Discussion

A significant non-linear trend in the ability to communicate was found, with an increase from baseline to 16 weeks. After a peak at week 16, improvement ceased. No significant interaction between the time and number of attendances was found. For persons with moderate dementia as well as those with severe dementia, a significant improvement in communication ability was reported, with a pattern similar to that for the entire group of residents. Furthermore, both verbal and non-verbal communication abilities increased from baseline to 16 weeks: verbal communication increased slightly and even nearly linearly, whereas non-verbal communication improved quickly at the beginning and then levelled out at the end. These findings will now be discussed.

The pattern of changes in communication abilities observed in this study is not consistent with the findings from a previous study [25]. Strøm et al. [25] reported a significant improvement in the communication abilities of those who attended the Sonas sessions during the 24-week study period, but no overall effect. One explanation for these inconsistent findings could be that the studies used different communication measures, which also measured different aspects of communication. The previous study by Strøm et al. [25] used the Holden Communication Scale (HCS), while the present study used the TCT. The HCS is a measure of memory and awareness as well as of communication, while the TCT mainly assesses non-verbal communication.

Another reason for this seeming disparity between the findings of the two studies could be that the HCS assessed communication ability completely independently of the Sonas programme, while the TCT was used to measure communication ability immediately after a Sonas session. By assessing the impact immediately after the session, the TCT is arguably a truer measure of the impact of the Sonas programme on communication.

A similar study [26] which assessed the effect of the Sonas programme from the perspective of 17 Sonas Licenced Practitioners and other care home staff found that the Sonas programme had a number of positive, predominantly short-term, effects on the participants. Positive effects were reported in relation to mood, cognition, communication, interaction, and activity, with residents facilitated to speak and interact with the other participants during the Sonas sessions, where an increase in the length of residents' conversation was observed. It was suggested that this could be linked to the residents feeling more confident. Changes in non-verbal communication were also observed, both during sessions and on days when the intervention did not take place.

According to Bayles and Tomoeda [5] one important element of sensory stimulation is to repeat the stimulation in the same way from one session to another; this has been reported to be appropriate for residents with moderate dementia as well as for those with severe dementia [30]. This recommendation was effectively followed here, as the Sonas programme involves a repetition of stimulation, with every Sonas session having the same structure, in the belief that repetition is a way to evoke memory [23].

It is difficult to explain why the increase in communication abilities both for residents with moderate dementia and for those with severe dementia ceased after the 16-week time point. It could be that a peak was reached at 16 weeks, beyond which it was not possible to achieve further improvements in communication abilities, given the reduced cognition in persons with dementia. It is also possible that the progression of dementia after 16 weeks influenced the results, but this again is unlikely, because the persons with moderate dementia as well as those with severe dementia demonstrated similar upward trajectories in communication abilities over the 16-week period. Another possible explanation is that the participants could have experienced boredom from attending the same programme over a long period, which supports the need for different types of stimuli [31]. This can be tested in a new study. However, even though the results show an improvement in communication ability only over a 16-week period, we should see this as clinically meaningful. One of the core components of providing psychosocial interventions to persons living with dementia is the belief that it can give them the experience of quality of life during the actual intervention, even if they forget afterwards that they have attended a session. This also raises the question about how to evaluate psychosocial interventions, since the focus is usually on long-term effect instead of on the value for the person's quality of life in the present situation.

The characteristics of the person, described by Cohen-Mansfield et al. [32] as personal attributes, are likely to influence a person's ability to engage with stimuli. Personal attributes can include cognitive function, past interests, apathy, a propensity for enjoying social activities, and hearing and vision [33]. In the present study we did not control for all of these personal attributes, but we did analyse communication abilities of persons with moderate and severe dementia and found a similar pattern of increased communication abilities from baseline to a peak at week 16. An explanation could be that implementing something new for a group of people has an effect in itself. As expected, communication abilities were poorer among those with severe dementia than among those with moderate dementia. However, a similar trend of improvement indicates that it is possible to use the Sonas programme regardless of the degree of dementia, and that communication abilities can be improved through a sensory intervention programme. It also supports the knowledge that communication is not totally lost in people living with severe dementia.

Even though problems with verbal communication are expected to worsen as part of the dementia process [6], both verbal and non-verbal communication increased from baseline to a maximum at 16 weeks in the present study. Verbal communication increased slightly, whereas non-verbal communication increased from baseline to 16 weeks and then remained almost stable over the last 8 weeks.

These findings are not consistent with those of the previous study by Strøm et al. [25] which found that the Sonas programme had less of an effect on aspects of communication that required the ability to give a verbal response. One explanation could be the difference in assessment measures used in the two studies; another explanation is that the immediate effect of the Sonas programme is greater, being reported immediately after the sessions, as compared to a possible effect reported on another day.

### *Strengths and Limitations of the Study*

To our knowledge, this is the first study to assess the impact of the Sonas programme on communication where the assessments were carried out during the sessions using the TCT. A limitation of the study is that we had a small sample size and that we used an observational design. However, the aim was not to study the effect in relation to a contrast condition, like care as usual, but to examine the impact of the Sonas programme during the sessions. Another limitation was the use of the MMSE to assess the residents' cognitive ability. Even though the MMSE has been reported to be inadequate for people with minimum literacy skills and to record cognitive changes in people with severe dementia, it was used in this study because the nursing homes were already using the tool and since cognitive ability was not used as an outcome. The study's strengths are its use of a psychometric-tested dementia-specific instrument to assess communication ability and the scarcity of evidence of psychosocial interventions on communication in people living with dementia.

### *Implications*

The results of this study showed that communication abilities increased with the time of the intervention in the Sonas programme among nursing home residents with moderate-to-severe dementia. However, the peak of this increase was achieved at 16 weeks, after which it ceased. This indicates that when using the Sonas programme, one should continue for at least 16 weeks before evaluating the effect. At the same time it is important to value the impact it has on a person's quality of life at the present moment.

We would like to see an extension of the TCT based on the findings of the present and previous studies mentioned here. Evaluating smell and taste should be added to the instrument, which would open up the possibility of using a "new" TCT to evaluate all aspects of the Sonas programme. It would also be useful to apply other methods for assessing the impact of the Sonas programme, such as dementia care mapping or video recording of sessions, to facilitate an evaluation of the different components of the Sonas programme.

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## **Statement of Ethics**

The study was approved by the Regional Ethics Committee of Norway (REC) under registration No. IRB 0000 1870. No ethical approval was needed in Ireland, except from the Board of Management in each nursing home. Informed consent was obtained from the person with dementia, or from the next of kin if the person with dementia did not have the capacity to complete the consent form.

## Disclosure Statement

The authors have no conflicts of interest to disclose.

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