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Interactive Technologies supporting Cognition in People with Dementia – preliminary results!

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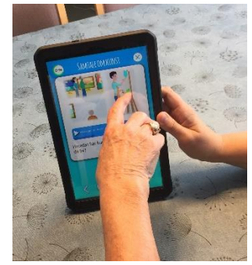

Background. Cognitive stimulation therapy (CST) is a psycho-social group intervention capable of improving cognition in people with dementia (PWD)[1,2] and a culturally-adapted Danish model has been validated. This pilot study examines whether Interactive technology supporting a basic and maintenance program (mCST) is relevant to use in Danish day care facilities or in people`s homes in one-to-one interaction.

Aim. *The aim is to investigate whether digitalized CST can support PWD and their close relatives cognitively and mentally in their homes and support CST training by professional CST facilitators in municipalities.*

Methods. A prototype to assist PWDs trough tablet supported CST sessions has been developed by Brain^{+} in co-creation with partners in 2020. The content is based on the Danish CST manual[3] and CST key principles[3].

This is a small pre-post pilot design with test times by 0, 7 and 12 wk (end point results are *not* collected yet). The program was facilitated for eight 65^{+} outpatients and their relatives in the Municipality of Syddjurs and they were guided to complete 1 session, 2x week in 12 weeks, Aug–Dec 2020. PWD had diagnosed dementia, and initially, a Mini Mental Examination Score (MMSE) of 15-25. None had trained CST before. Initially, their socio-demographic data was collected. PWD`s cognition (MMSE-2[4]) and quality of life (QOL-AD[5], self-rating and proxy) were measured by 0 and 7 wk; the latter time point has earlier shown positive cognitive effects for PWDs following basic, *group* CST[1,2]. By 7 wk, program adherence, user satisfaction with content and technique were evaluated by in-writing, participants`s self-rating of each session and uncovered in interviews and by auto-generated data on session time consumption. PWD´s medication was noted.

Results.

SOCIO-DEMOGRAPHICS: Recruited PWD were 6F/2M with average age of 75,8 yr and MMSE 21, with Alzheimer`s disease (7) or Lewy Body dementia (1). Two were living alone, and these received CST in Day Care Centre by a professional. Their adult educational level were 0-2 yr (6) and 3-4 yr (2). The CST partners were spouses (5), adult child (1) and professional (1, assisting 2 x 1 PWD).

PROGRAM ADHERENCE: 2/8 never initiated the program–here termed as "*non-users*". Oppositely, three PWD and their CST supporters completed all or more sessions (13-15) and used an average time of more than 25 min/session ("*Super-users*"). Between these two categories were "*low-moderate-users*" which either performed only a low number of sessions (< 10) and/or only used short time on each session (< 10 min). In 2/3 of these cases, it was due to severe sickness and hospitalization of the close relative.

COGNITION AND QUALITY OF LIFE:

TABLE 1: CST time consumption and PWD´s cognition & QOL by 7 wk

	Number of sessions performed	Average session time/min	MMSE difference (0-7 wk)	Average QOL-AD difference (self rapp + proxy)
"SUPER USERS"				
A*	13/14	44,5	+4 (23-27)	ND
B*	15/14 (+1)	35,8	0 (24-24)	ND
C	15/14 (+1)	25,3	+3[a] (18-21)	0
"LOW TO MODERATE USERS"				
D	14/14	5,2[b]	+1 (23-24)	-1
E	8/14[c]	35,0	-3 (22-19)	+3
F	9/14[d]	17,9	ND	ND
"NON USERS"				
G	0/14	0	ND	ND
H	0/14	0	ND	ND

*CST with a professional; ND = not performed; a = PWD started anti-dementia medication in intervention period; b denotes an uneven CST participation profile with 1st session lasting 50 min; the others with an average of just 3.8 min, but a high number of sessions completed; c = CST has not been performed for the last month (with 1 exception) due to disease of relative; d = low number of sessions completed due to disease of relative

Among the "*Super-users*" there was average improvement in cognition on 2,3; 2 with progress and one with status quo. The one with progress of 3 MMSE points had started anti-dementia medication within the test period, which also can cause cognitive improvement. The pilot results are not conclusive but points to potential cognitive benefits of intensive CST training. Among the "*Low to Moderate-users*", one had a small progress, another one a decline of 3 MMSE points, the latter had not being doing CST for the last month due to disease of her spouse. Oppositely, she had a marked progress in QOL. She and her husband highlighted in interview that she due to CST has more courage to do and say things. Courage and higher self-esteem was also issues mentioned in interview with another CST participant, the one, with the highest MMSE improvement.

QUALITY OF THE PROGRAM:

TABLE 2: In-writing, self-rating of the digital CST program and technique

Self-rating questions for each session	Self-rating summary for 14 sessions (numbers)(percentage)	
How was it to perform the session together?	Bad (3) Good (29)/very good (32)	(4,7%) (95,3%)
How much did you speak?	Not much (3) Some (49)/A lot (12)	(4,7%) (95,3%)
How much did you laugh?	Not much (14) Some (39)/A lot (11)	(21,9%) (78,1%)
How much did you use your brain?	Not much (2) Some (45)/A lot (17)	(3,1%) (96,9%)
Did you think new thoughts?	Not much (26) Some (35)/A lot (3)	(40,6%) (59,4%)
Did the technique work out?	Bad (0) OK (17)/Excellent (47)	(100%)
How was the lengths of the sessions?	To short / To long (0) Appropriate (100)	(100%)

In-writing scores (Table 2) showed positive outcomes on program quality and technique. However, interviews revealed also some negative responses, which we will deal with in close future. Especially, some relatives felt a high pressure having the responsibility for keeping a good dynamic in the CST sessions. Regarding interview with the professional, she sees potential in this digital CST program for supporting and structuring CST for CST facilitators.

Conclusion. The pilot results provide a basis for extended studies and for refinement of the digital CST program

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REFERENCES: [1]Spector et al., 2003; [2]McDermott, 2018; [3]Johannesen, Spector & Gregersen, 2019; [4]Folstein, 1975; [5]Logsdon et al., 1999

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