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RESEARCH ARTICLE

Constructive engagement in cognitive stimulation therapy groups among people with dementia: A mixed-methods study

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Abstract

Introduction: Clinical guidelines recommend personalized activities and group cognitive stimulation therapy (CST) for promoting cognition, independence, and well-being in persons with dementia. Constructive engagement (CE), the state of being occupied positively in purposeful activities, is theoretically an essential process in personalized activities and CST. However, whether CE develops over time and what contributes to it are unknown. We investigated changes in CE during CST and its contributors.

Methods: This is a mixed-methods study. We used time sampling to record the time proportion of persons with dementia ($n = 113$) spent in constructive, passive, non–task-related engagement and non-engagement during early, middle, and late phases in a 14-session group CST. We tested changes in time proportion between phases using repeated analysis of variance (ANOVA). We analyzed qualitative interviews of CST facilitators ($n = 12$) thematically to explore contributors to CE.

Results: Persons with dementia spent 51% and 46% of their time in constructive and passive engagement, respectively. Time of engagement in non–task-related activities and non-engagement was minimal. CE remained stable at around 50% of activity time throughout the intervention course, except for a slight increase from the early to middle phase (48% to 55%, $F(2224) = 3.779$, $p < 0.05$). Age ($r = -0.26$, $p < 0.01$), cognitive function ($r = -0.29$, $p < 0.01$), and activities of daily living ($r = 0.20$, $p < 0.05$) at baseline were significantly correlated with CE, but gender and education were not. Contributors to CE include (1) tailoring activities, (2) using group dynamics, and (3) promoting positive experiences.

Discussions: Group CST engages persons with dementia well, regardless of their differences in gender and literacy levels. CE remained relatively stable during CST, and younger, more physically and cognitively able people showed slightly greater CE. In group-based interventions, facilitators' skills and techniques could enhance CE. Future studies may focus on how CE as a plausible change mechanism further improves the intervention outcomes of persons with dementia.

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KEYWORDS
action mechanisms, cognitive stimulation therapy, dementia, engagement, facilitating skills, group activities, non-pharmacological interventions, process measures

Highlights

- Cognitive stimulation therapy (CST) is a non-pharmacological intervention that involves group-based activities and exercises to improve cognition and quality of life for persons with dementia, but the specific mechanisms behind it are not yet fully understood.
- This study is the first to investigate constructive engagement (CE), which describes active involvement in meaningful activities or complex interventions, specifically CST, for persons with dementia.
- CST engages them well, regardless of gender and literacy differences. CE time increases at the early intervention phase and stabilizes later on. CE occupies around half of the intervention time throughout CST, which can still be further increased by activity design and facilitators' skills.

1 | INTRODUCTION

Activity participation is an innate human need that persists in persons with dementia despite cognitive impairment.[1] Group activities, where persons with dementia can engage simultaneously with physical and social environments, are commonly used in non-pharmacological interventions.[2,3] Participation in group-based interventions delays cognitive decline,[4] reduces behavioral and psychological symptoms of dementia,[5] and improves quality of life.[6] Clinical guidelines recommend personalized activities and group cognitive stimulation therapy (CST) for promoting cognition, independence, and well-being in people with dementia.[7] However, the engagement process of persons with dementia in activities and the contributors are under-researched.

Engagement, "the state of being occupied by external stimuli," differentiates physical presence from behavioral, mental, and emotional involvement in activities.[8] Engagement considers reserved capabilities, interests, needs, and preferences of persons with dementia rather than keeping them busy throughout the activities.[9] It upholds person-centered values and prioritizes the protection of personhood and well-being.[10] Appropriate engagement can enhance positive emotions, functioning, and quality of life and mitigate agitation, boredom, and loneliness.[9,11] Inappropriate engagement leads to problematic or disruptive responses to external stimuli, presenting as purposeless, repetitive, aggressive, or agitated behavior.[11,12]

In purposeful activities, the intensity of engagement may vary from person to person. Based on a hierarchical ladder (in descending order), it can be categorized into constructive engagement (CE), passive engagement (PE), active engagement (AE), and non-engagement (NE).[11,13] CE refers to individuals' motor or verbal behaviors targeting purposeful activities. Given co-activities, CE can be specified as collective (e.g., co-working, cooperative behaviors) and individual CE (CCE and ICE).[14] PE refers to an attentive state, such as listening, watching, and nodding. AE shares CE's manifestations but does not target purposeful activities. NE covers purposeless, repetitive, or disruptive behaviors (e.g., looking into space, sleeping, murmuring). CE, characterized by its high intensity of active participation, may serve as a fundamental change mechanism that contributes to the improved outcomes observed in personalized activities and CST.

We lack research on CE in complex interventions (e.g., multicomponent, personalized, or group activities) in non-institutionalized settings, such as real-life or community-based contexts. Current research contexts on CE are mainly simple stimulation (e.g., responses to specific objects),[15] single activities (e.g., singing, gardening),[3,16] or technology-facilitated activities in nursing homes.[17,18] CE is studied as a static state parallel to other intervention outcomes rather than as a changing process, even in multi-session activities.[19–21] According to the biopsychosocial model, the capacity of persons with dementia in activity participation may be shaped by the interactions of biological and psychosocial factors.[22] Once external demands exceed a person's capability reserves, disengagement occurs.[12] Perceived self-usefulness of persons with dementia also affects their engagement in the designed activities.[19] The comprehensive process model systematically conceptualized factors affecting engagement into personal characteristics, stimuli features, and environmental factors.[20,21] In group activities full of social stimuli, their activity engagement substantially relied on the residual capabilities and external guidance from others.[21,23,24] Not all factors are modifiable or weighted similarly in affecting engagement. However, little research investigated engagement as a dynamic process and identified modifiable factors contributing to CE, especially in complex interventions delivered regularly over a longer period for people with dementia.

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Group CST, exposing persons with dementia to multiple stimuli in complex social situations, provides such a research context. CST applies the "use it or lose it" theory and emphasizes engaging persons with dementia constructively in information processing through cognitively stimulating and socially enjoyable activities and discussions.[25] It entails 14 group sessions (twice weekly over 7 weeks), and each session consists of warm-ups, themed activities, and closing activities.[26] The themed activities tend to be ecological, such as orientation, food, and using money, and the key CST principles emphasize continuity and consistency between sessions and building up/strengthening relations (Table S1). CST is an evidence-based practice recommended by clinical guidelines[7] and completes cultural adaptation for Hong Kong Chinese.[27] It has shown effectiveness in maintaining cognition, improving quality of life, enhancing communication, and slowing the progression of psychological and behavioral symptoms.[28–31]

This study (1) hypothesizes that CE and its subtypes increase throughout CST, and (2) explores modifiable factors that enhance CE, focusing on the features of stimuli, social interactions, and environmental factors. With these research questions, we aim to inform future study designs on engagement as a potential mechanism for improving non-pharmacological interventions.

RESEARCH IN CONTEXT

1. **Systematic review**: The authors conducted a literature review on cognitive stimulation therapy (CST) and constructive engagement (CE) in persons with dementia. Evidence of CST in improving cognition and quality of life is well established, but there is limited research in CE that describes active involvement in meaningful activities as the change mechanism for complex interventions.
2. **Interpretation**: We explored the patterns of CE among persons with dementia in CST, evaluated its evolution throughout CST, and identified the factors contributing to CE. These findings unfold the activity experience of persons with dementia and indicate the practical strategies to increase their CE.
3. **Future directions**: With the understanding of CE in non-pharmacological interventions, we will further explore how CE affects intervention outcomes, such as cognition, communication ability, quality of life, and even the quality of relationships with caregivers. Future research will provide valuable insights into the mechanisms underlying the benefits of such interventions.

2 | METHODS

2.1 | Study design

This mixed-methods study employs time-sampling observation to study the over-time engagement change and qualitative interviews to identify the modifiable factors enhancing CE. In the observation study, we recruited persons with dementia from 19 CST groups from the community and residential care facilities in Hong Kong. They should be: (1) 65 years old or above; (2) Cantonese or Mandarin speaking; (3) clinically diagnosed or with a cognitive assessment result using locally validated tools suggesting mild to moderate cognitive impairment; and (4) able to see, hear, and communicate for activity participation. We excluded those who had physical constraints, disability, disruptive behavior, or psychotic symptoms affecting activity participation or who had received CST within 1 year before enrolling in this study. The following qualitative study targets group facilitators. They should be: (1) ≥18 years old, (2) Cantonese or Mandarin speaking, (3) attached to or supervised by a community or residential service unit, and (4) trained facilitators who led the CST group for persons with dementia in the observation study.

2.2 | Data collection

The trained assessors collected information on the demographics, cognition, and functional ability of persons with dementia within a 30-day timeframe before and after group CST. Using time-sampling methods, for each person with dementia, six 5-minute observation windows during the CST sessions were drawn. The 14 sessions were divided into early (Sessions 1–5), middle (Sessions 6–10), and late (Sessions 11–14) phases, and two non-consecutive observation windows were taken from one randomly selected session within each phase. If the targeted participant was absent during the selected observation window, another observation window in the following session at the same phase was selected as a replacement. Before observational data collection, two licensed social workers, independent of any care facilities that provided CST, processed training to ensure their understanding and implementation of the engagement rating. After establishing inter-rater reliability of engagement ratings (Cohen's kappa = 0.84),[32] they conducted the non-participatory observation independently (n = 142 sessions). In each session, one assessor sat in the corner of the activity room, observed different participants based on a prescheduled sequence, and marked engagement types using a time log designed for this study. After the intervention, the first author, a licensed social worker and international CST trainer, conducted semi-structured interviews with facilitators to explore their experience and reflections on engaging participants in CST. All the interviews were audiotaped and transcribed verbatim for analysis.

2.3 | Measures

Engagement type was measured by the Myer Research Institute Engagement Scale (Cohen's kappa = 0.90~0.95), [11,13] in cooperating with the concept of collective engagement in group activities.[14] Engagement types include CCE, ICE, PE, AE, and NE. At the end of

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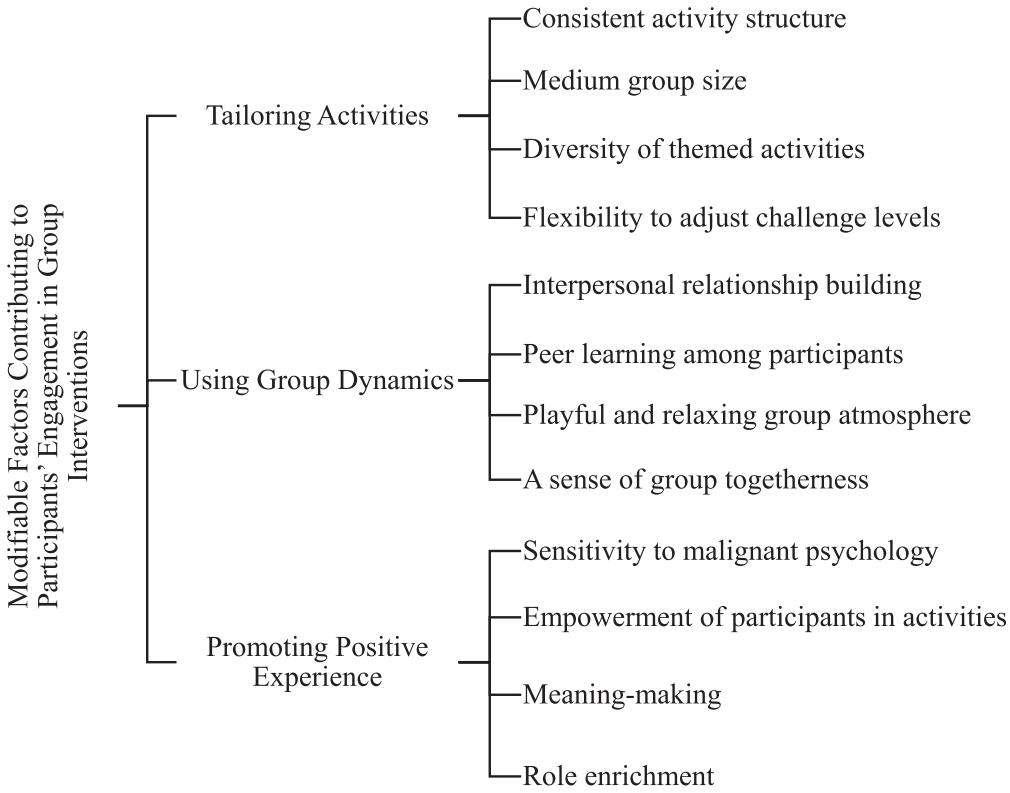

FIGURE 1 Thematic map of factors affecting the engagement of persons with dementia.

each minute during the 5-minute observational window, the dominant engagement type (in terms of duration) was recorded. To align with outcome measures of CST in previous studies, [28–31] we also measure the cognition and functioning state of persons with dementia by the validated Chinese version of the Alzheimer's Disease Assessment Scale Cognitive Subscale (Cronbach's $\alpha = 0.91$) [33] and the Alzheimer's Disease Cooperative Study-Activity of Daily Living (Cronbach's $\alpha = 0.91$).[34] Higher scores indicate better cognition and greater independence.

2.4 | Statistics

Descriptive statistics were used to delineate sample characteristics and engagement types. We use repeated analysis of variance (ANOVA) and multiple paired *t*-tests with a Bonferroni correction for pairwise comparison to detect changes in CE across CST phases. Little tests were conducted for missing data analyses. Missing values of engagement were imputed using the sample mean in the corresponding engagement type from the same phase. Associations between participants' characteristics and their overall CE were explored using independent-sample *t*-tests and bivariate correlations. Three researchers who had more than 3 years of experience in dementia research or service were involved in the thematic analysis of qualitative interviews.[35] They reviewed all the transcripts independently and generated 23 initial codes in total. Then, they refined codes to conceptual themes at a higher level (Table S2) and finally developed a logic map (Figure 1). Supporting quotes were charted correspondingly. Analyses were performed using SPSS 24.0 and Nvivo 12.

3 | RESULTS

A total of 113 persons with dementia enrolled in this study (Table 1). Attendance rates of CST groups were high, with only 8.8% attending fewer than nine sessions. Most participants (75.2%) were female; 46.0% received no formal education. The 12 CST facilitators from community centers, daycare centers, and residential care units accepted the interviews and were diverse in training backgrounds (Table S3).

3.1 | Changes in constructive engagement over time

Persons with dementia engaged constructively 50.9% of the time and passively 45.5% of the time in CST groups (Table 2). Engagement data were randomly missing, and the percentage was less than 10% (Table S4). These missing data did not affect the results of statistical analyses (Tables S5–S7). Repeated ANOVA showed that CE ($F(2224) = 3.779$, $p < 0.05$; $\Delta_{Mean} = 7.5\%$, $p < 0.05$) increased slightly from the early to the middle phase of CST, particularly the individual subtype ($F(2224) = 3.433$, $p < 0.05$; $\Delta_{Mean} = 6.1\%$, $p < 0.05$) (Table 3). Age, daily activity functioning, and cognitive performance correlated

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TABLE 1 Demographics and intervention information of persons with dementia ($n = 113$).

Variables	N (%) / Mean (*SD*)
Age, years (Mean, SD)	85.80 (6.27)
Gender	
Male	28 (24.8%)
Female	85 (75.2%)
Education, years (Mean, SD)	3.65 (4.40)
No formal education	52 (46.0%)
Have formal education	61 (54.0%)
Mobility (ADCS-ADL[a]) (Mean, SD)	41.29 (21.31)
Cognitive performance (ADAS-Cog[b]) (Mean, SD)	24.36 (13.81)
Types of dementia	
Alzheimer's disease	28 (24.8%)
Others	11 (9.7%)
Unknown	74 (65.5%)
CST attendance rate	
14 Sessions (full attendance)	54 (47.8%)
12–13 Sessions (>85% attendance)	37 (32.7%)
10–11 Sessions (>70% attendance)	12 (10.9%)
9 Sessions or below	10 (8.8%)
Service settings	
Community care	60 (53.1%)
Daycare	22 (19.5%)
Residential care	31 (27.4%)

Abbreviations: ADCS-ADL = Alzheimer's Disease Cooperative Study—Activity of Daily Living; ADAS-Cog = Alzheimer's Disease Assessment Scale-Cognitive Subscale; SD, Standard deviation.
[a]0–78, higher scores indicating better independence.
[b]0–70, higher scores indicating poorer cognitive functioning.

with CE, whereas gender and education did not. When broken down into subtypes, cognition correlates with CCE but not ICE (Table 4).

3.2 | Factors contributing to constructive engagement

The qualitative study identified *tailoring activities*, *using group dynamics*, and *promoting positive experience* as three themes regarding enhancing CE in group activities (Figure 1, quotations in Table S8).

Tailoring activities means adapting the environmental and contextual factors to the residual capability, personal interests, strengths, and potentials of people with dementia. The characteristics of engaging activities include *consistent activity structure*, *medium group size*, *variety and diversity of themed activities*, and *adjustable challenge level of activities*. First, facilitators noted that consistent activity structure (e.g., frequency, time, venue, session flow) encouraged participants' initiation and openness to sharing during activity participation. The regularity helped persons with dementia familiarize themselves with the environment and develop habits, which may result in reduced uncertainty and increased security, contributing to attentive participation. Second, facilitators considered 6–8 persons as an ideal group size for a 45minute group session. Under these circumstances, facilitators could "take good care of each participant" and enable them to have "a good group atmosphere." Group activities conducted within a medium-sized group provide adequate social stimulation for the participants and can enhance a sense of closeness among them. Third, facilitators noted that the diversity of themed activities could arouse participants' curiosity and inspire their potential. CST activities encompass a wide range of topics, including past history (e.g., childhood), daily life (e.g., money, orientation), hobbies (e.g., word games, number games), or imagination (e.g., creativity, word association). Participants' exposure to these activities, which are designed to be inclusive for participants of all genders and backgrounds, could reveal their interests and strengths. Finally, facilitators remarked on the flexibility in adjusting the challenge levels of activities to engage persons with dementia whose physical and mental states may change moment by moment. Sometimes, facilitators must "modify the sequence of themes" promptly, interpret and contextualize the themed activities creatively, and maintain mental stimulation and enjoyment for persons with dementia.

The use of group dynamics is unique in group work. The strategies that facilitate individual changes and promote continuous engagement in meaningful activities include *establishing interpersonal relationships*, *peer learning*, *group atmosphere*, and *group belongingness*. Facilitators noted that the trustworthy relationships with persons with dementia resulted in increased engagement and reduced disruptive behavior. Individuals' deficits and self-efficacy could be compensated and boosted through interpersonal cooperation as a team. Peers as role models were persuasive for participants to imitate or follow because peers' successful experiences evoked their desire and confidence to try something new. In addition, a playful and relaxing group atmosphere enabled an error-free and implicit learning environment. Instead of training, gathering for "happiness" and "fun" afforded participants increased autonomy. The "togetherness" is the foundation for nurturing companionship, friendship, and group ownership among participants. Facilitators can consolidate this sense through co-creation ("doing it together"), positive meaning-making of connectedness, and group rituals.

Promoting participants' positive experiences relies on facilitators' intentional construct of a psychosocial environment that shapes participants' behavior and makes them feel "good" about themselves. With reduced psychological resistance, it would be possible to highly engage in purposeful activities. The constructing process required facilitators' *sensitivity to malignant social psychology* and their good use of *empowerment*, *meaning-making*, and *role enrichment*. With the awareness of malignant social psychology, facilitators noted the importance of reshaping their relationship with participants from leadership to partnership and shifting the communication style from teaching to sharing. Instead of being a "teacher," they needed to spend most of their time "encouraging communication between participants." Empowerment was essential to facilitate the actualization of successful

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TABLE 2 Descriptive statistics of engagement time proportion during CST sessions ($n = 113$).

Type of engagement	Overall	Early (Sessions 1–5)	Middle (Sessions 6–10)	Late (Sessions 11–14)
Constructive	50.9% (0.17)	47.8% (0.23)	55.3% (0.26)	49.7% (0.23)
Collective	29.9% (0.20)	30.7% (0.26)	32.1% (0.27)	27.1% (0.26)
Individual	21.0% (0.14)	17.1% (0.18)	23.2% (0.22)	22.6% (0.23)
Passive	45.5% (0.16)	48.3% (0.22)	42.0% (0.25)	46.0% (0.23)
Active	1.5% (0.04)	1.2% (0.05)	1.1% (0.06)	2.0% (0.06)
Non-engagement	2.2% (0.06)	2.5% (0.10)	1.0% (0.06)	2.2% (0.07)

Abbreviation: SD = Standard deviation.

TABLE 3 Repeated analysis of variance for constructive engagement and its subtypes ($n = 113$).

	Constructive engagement[a]			Collective subtype[b]			Individual subtype[c]		
	Mauchly's Test of Sphericity								
χ^2	df[e]	*p*	χ^2	df	*p*	χ^2	df	*p*	
Time[d]	0.821	2	0.663	2.800	2	0.247	4.096	2	0.129
	Tests of within-subjects effects								
	Df	*F*	*p*	df	*F*	*p*	df	*F*	*p*
Time	2	3.779*	0.024	2	1.725	0.181	2	3.433*	0.034
Time (Error)	224			224			224		
	Pairwise Comparisons								
	Δ_{Mean}[f]	*SE*[g]	*p*	Δ_{Mean}	*SE*	*p*	Δ_{Mean}	*SE*	*p*
Early minus middle phases	−0.075*	0.029	0.034	−0.014	0.028	1.000	−0.061*	0.024	0.037
Middle minus late phases	0.055	0.029	0.169	0.050	0.030	0.283	0.005	0.028	1.000
Early minus late phases	−0.020	0.027	1.000	0.036	0.026	0.498	−0.056	0.025	0.087

**$p < 0.01$.
*$p < 0.05$.
[a]Time proportion of constructive engagement.
[b]Time proportion of collective constructive engagement.
[c]Time proportion of individual constructive engagement.
[d]Three time points, including early sessions, middle sessions, and late sessions.
[e]df = degrees of freedom.
[f]Δ_{Mean} = mean difference.
[g]SE = standard error.

experiences for persons with dementia, which would further promote their engagement. The strategies of encouraging them to attempt challenges (e.g., "conveying them the message that they could do anything they wanted to try") and acknowledging their abilities made persons with dementia open to exploring their hidden strengths and potentials. Meaning-making in an episodic way, such as "setting the scene for conversations," could increase the fun, transfer negative perceptions into positive ones, and enrich the subjective experiences of persons with dementia beyond the activities per se. Under these circumstances, facilitators could fuse cognitive exercises for persons with dementia into co-creating conversations. In addition, role enrichment appeared to promote engagement. Persons with dementia, especially those who became institutionalized, were dominant by the role of "patients." Group activities, in which participants were allowed to "have another identity," such as group member, leader,[36–38] and friend, could address their role loss as social beings (e.g., family, productive, and leisure roles).

4 | DISCUSSIONS

This is the first in-depth study to systematically investigate engagement as the key mechanism in group CST. The study found people with mild to moderate dementia engaged in purposeful activities most of the time during CST (96%). Although CE contributed to over half of the engagement time, the fact that a significant amount of time (45%) was spent in PE suggests room for further enhancement of CE. We observed a small but significant building up of CE, especially the individual subtype, from the early to middle phase of CST. Younger, more physically and cognitively able people showed greater CE. Facilitators attributed better engagement to tailoring, group dynamics, and positive experience. These findings opened new areas for improved practice and further research.

The high-level engagement throughout the sessions echoes frontline impressions that are anecdotally reported in practice. Even during

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TABLE 4 Associations between personal factors and constructive engagement ($n = 113$).

	Constructive engagement[a]				Collective subtype[b]				Individual subtype[c]			
	n	Mean	*SD*[d]	*p*	N	Mean	*SD*	*p*	N	Mean	*SD*	*p*
Gender				0.748				0.751				0.389
Male	28	0.518	0.160		28	0.288	0.208		28	0.230	0.147	
Female	85	0.506	0.171		85	0.302	0.204		85	0.204	0.135	
Education				0.217				0.131				0.455
Yes	52	0.488	0.178		52	0.267	0.192		52	0.221	0.116	
No	61	0.527	0.158		61	0.326	0.211		61	0.201	0.155	
	N	*r*[e]		*p*	N	*r*		*p*	N	*r*		*p*
Age	113	−0.257**		0.006	113	−0.174		0.065	113	−0.055		0.566
ADCS-ADL[f]	111	0.204*		0.032	111	0.158		0.097	111	0.015		0.876
ADAS-Cog[g]	113	−0.291**		0.002	113	−0.266**		0.004	113	0.040		0.674

**$p < .01$
*$p < .05$
[a]Time proportion of constructive engagement.
[b]Time proportion of collective constructive engagement.
[c]Time proportion of individual constructive engagement.
[d]SD = standard deviation.
[e]r = Pearson's *r*, correlation coefficient.
[f]ADCS-ADL = Alzheimer's Disease Cooperative Study—Activity of Daily Living, possible range 0–78, higher scores indicating better independence.
[g]ADAS-Cog = Alzheimer's Disease Assessment Scale-Cognitive Subscale, possible range 0–70, lower scores indicating better cognitive functioning.

the early phase, CE contributed to nearly half of the therapy time, with CCE remaining stable throughout. This may suggest that the group context, activity design, and CST principles promote CCE by design. The build-up of ICE could be due to steps taken by facilitators, such as tailoring and promoting positive experiences, while group dynamics contributed to new behaviors and learning.

Unsurprisingly, younger age and higher functioning levels are associated with more CE time. Different from the findings in other cognitive stimulation exercises,[39] there was no effect of gender and education on CE in CST. Almost half of the participants received no formal education. This indicates that education does not affect CE substantially. CST covering various themed activities can engage a wide range of participants with dementia regardless of gender difference and literacy level. It is worth investigating the characteristics of more engaging activities for people with dementia. Based on the biopsychosocial model, emphasizing addressing modifiable factors contributing to excess disability,[22] CE may potentially be dissociated with age and functioning level, with future research and practice focusing on factors identified in the qualitative study.

The importance of tailoring and personalizing activities in outcomes of persons with dementia has been noticed by various theoretical perspectives, including person-centered care focusing on individuals as social beings[9] and occupational therapy emphasizing a match between residual capabilities and external demands (i.e., appropriateness of challenge).[12] With increasing research on activities tailored to the residual capabilities, functional levels, needs, interests, and personal preferences in people with dementia,[40–42] a meta-analysis has shown that the degree of personalization in tailored activities affects behavioral and psychological symptoms and quality of life.[43] Whether the degree of tailoring and personalization exerts an effect on dementia outcomes through CE requires further exploration.

Group-level tailoring activities could be challenging, as the careful consideration of diverse backgrounds and needs of individuals with dementia is required to ensure inclusiveness for each participant,[44] which in turn affects group dynamics, another key factor identified as affecting engagement. Our qualitative findings provided the rationale from an engagement perspective for the recommended format in group CST (i.e., a closed group of six persons with similar levels of dementia severity),[26] which is a balance between sufficient social interaction through peer learning (with small groups, this can be affected by the absence of members, e.g., due to hospitalization) and rapport building through exploration to encourage engagement. In line with previous suggestions, an appropriate loading of social stimulation in activity design may increase the sense of mastery in persons with dementia,[45] whereas loneliness, social isolation, or lack of close friends may aggravate cognitive difficulties.[46,47]

There is room for further increasing CE by transforming PE (to about half of the session time) in some CST groups. Whether persons with dementia can maintain CE throughout a 1-hour group activity session is an empirical question for further investigation, which could be affected by age and functioning level. Our qualitative findings also provided some directions, for example, enhanced facilitating skills in empowerment, role enrichment, meaning-making, and other strategies for promoting a positive experience. These findings underscore the potential of group activity design and facilitation skills to improve the outcomes of persons with dementia, further revealing engagement as a plausible change mechanism of non-pharmacological interventions and the significance of understanding it within the research and practice.

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4.1 | Limitations

First, the study is not based on a random or population-based representative sample, and how persons with dementia engage in a CST group influenced by cultural values (e.g., conservatism) has been noted earlier.[27] We are cautious against generalizing our findings beyond the Hong Kong Chinese population but hope they provide data and perspectives for further hypotheses testing and cross-cultural investigations. Second, around 30% of participants reported a specific type of dementia, and future studies may compare engagement among persons with dementia regarding their types and stages. Third, there is no golden standardized engagement assessment in people with dementia. Although observation of behavioral performance is commonly used, due to the challenge of ensuring the validity of the subjective report of engagement level, this method has obvious drawbacks (e.g., the Hawthorne effect, observer biases, and lack of access to the internal experience of the person with dementia). We have tried to control some of these drawbacks, such as establishing inter-rater reliability based on existing scales and sitting in the corner of activity rooms to avoid direct eye contact with participants in the process, but we cannot rule out possible biases of the observation. Future studies, if feasible, may use video recordings of the group sessions and automated analyses (e.g., eye gazing) to minimize observer effects and improve objectivity. Meanwhile, more validated tools (e.g., with physiological measures and self-report) can be developed for more accurate assessments of engagement in people with dementia. We used the time proportion to indicate the level of different engagement types; conceptualization is needed to further define the "dosage" of engagement and refine a hierarchical concept on measurement of engagement intensity to allow future studies to investigate any dose effect of engagement on outcomes. Finally, limited by the need of purposive sampling in this qualitative study (facilitators completing the CST groups for persons with dementia in the observational study), the sample size was relatively small. Although we have tried to follow the maximum variation sampling and data saturation principles in participant recruitment, there is still a possibility that we have not yet exhausted the themes related to factors affecting engagement in people with dementia. Future work may include the views of family caregivers about factors contributing to engagement in group settings.

4.2 | Implications

Notwithstanding these limitations, this work represents a first attempt to understand the pattern and association of engagement among persons with dementia during CST through in-depth quantitative observation and qualitative inquiry, which could serve as groundwork to stimulate further research. The observational method and identified themes of modifiable factors in promoting CE are potentially applicable to group activities beyond CST and provide directions for clinical research and practice to improve outcomes of persons with dementia from activity-based group interventions.

5 | CONCLUSIONS

A better understanding of how the engagement of persons with dementia evolves within a group is essential for optimizing participants' experiences in meaningful activities and facilitators' efficiency in engaging the participants. Using group CST as an example of evidence-based group intervention, we noted a stably high level of CE in people with dementia, which showed small increments over time, especially in ICE. CE could be increased by addressing modifiable factors of tailoring, group dynamics, and positive experience.

AUTHOR CONTRIBUTIONS

A.Y.Z. planned the study, conducted the data collection and statistical analyses, interpreted the results, and drafted the manuscript. G.H.Y.W. and T.Y.S.L. supervised the study planning and data analyses. All authors contributed to the interpretation of findings and revision of the manuscript. All authors approved the final version of the manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest. Author disclosures are available in the supporting information.

CONSENT STATEMENT

The Human Research Ethics Committee of the University of Hong Kong approved the study (Reference No.: EA1801021 and EA1609034). Written informed consent was obtained, and persons with dementia required joint consent with their caregivers.

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