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## **Cultural Adaptation and Validation of Cognitive Stimulation Therapy (CST) for Older Persons with Dementia in Malaysia**

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### **Abstract**

Dementia-related cognitive impairment presents challenges to the quality of life of older individuals. Cognitive Stimulation Therapy (CST), an effective non-pharmacological intervention developed in the United Kingdom, faces limitations in its applicability to the cultural context of Malaysia. This study aims to culturally adapt and validate CST in Malaysia using the Formative Method for Adapting Psychotherapy (FMAP) model. Culturally tailored activities were developed to meet the preferences and needs of older Malaysians. The findings suggest that the Malaysian version of CST is a feasible and effective intervention for enhancing cognitive function among older individuals with dementia in Malaysia.

**Keywords:** Adaptation; Cognitive Stimulation Therapy; Older person; dementia

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### **1.0 Introduction**

There is a trend of an increased number of older people in Malaysia experiencing cognitive decline associated with dementia, which may lead to an increase in dependency on carers, decreased performance in daily activity and quality of life. The role of non-pharmacological treatment, such as Cognitive Stimulation Therapy (CST), in delaying the onset of dementia has been extensively explored in the past few decades. CST was developed in the United Kingdom and was based on the Cochrane systematic review of reality orientation (RO) and reminiscence therapy (Spector et al., 2003). There are three types of CST: Group CST, Individual CST, and Maintenance CST. According to Spector et al. (2003), Group CST is designed for those suffering from mild to moderate dementia. CST consists of 14 themed sessions conducted twice a week over seven weeks and involves activities such as word association, categorisation, current affairs, food, and number games (Spector et al., 2003; Aguirre et al., 2011). CST can be conducted in various settings, including residential homes, care homes, daycare centres, and memory clinics. The National Institute for Health and Clinical Excellence (NICE) recommends that people with mild to moderate dementia of all types should participate in structured group CST.

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Cultural validation and adaptation of Cognitive Stimulation Therapy (CST) in Malaysia are significant due to its multi-ethnic society. Malaysia's diverse population consists of various ethnicities – Malay, Chinese, Indian, and other ethnicities – each with its own cultural values, traditions, social norms, beliefs, practices, and languages. By considering the cultural nuances of different ethnic groups, the adapted CST can be more inclusive and effective in addressing the cognitive needs of older individuals from various ethnic backgrounds. This approach promotes cultural sensitivity and ensures that therapy is accessible and relevant to the diverse older Malaysian population. Hence, the objective of this study was to adapt, culturally validate, and test the group CST for older people in Malaysia.

## 2.0 Literature review

Previous studies indicate that CST improves cognitive functions (Gibbor et al., 2021; Sarageh et al., 2022; Dahlan et al., 2022; Wood et al., 2023), Mood (Chen, 2022) and quality of life (Gibbor et al., 2021; Wood et al., 2023) and the effect can be maintained after three months (Lin et al., 2018). In addition, CST could reduce depression among older people with dementia (Sarageh et al., 2022; Wood et al., 2023). Furthermore, data from qualitative studies indicate that the group CST improve social interaction, interconnection, happiness, a sense of togetherness and enrichment (Lauritzen et al., 2022; Wood et al., 2023)

CST has been culturally adapted, validated, and tested in many countries, such as Hong Kong (Wong et al., 2018), Taiwan (Tsai et al., 2019), Thailand (Srisuwan et al., 2017; Sipollo et al., 2019), Japan (Yamanaka et al., 2013), and Indonesia (Triestuning et al., 2019), among others. However, currently, there is a lack of sufficient evidence regarding the adaptation, cultural validation, and testing of group CST for older people in Malaysia.

## 3.0 Methodology

Permission to adapt and validate Cognitive Stimulation Therapy (CST) was obtained from the principal author of the CST, and the validation and adaptation of Cognitive Stimulation Therapy (CST) in Malaysia followed a five-phase process based on the Formative Method for Adapting Psychotherapy (FMAP) model. This model provides a bottom-up approach to culturally adapt CST, ensuring its applicability and effectiveness within the Malaysian context (Aguirre et al., 2014). The five phases of the methodology are as follows:

### 3.1 Phase 1: Generating knowledge and collaborating with Stakeholders

The first phase aimed to gather insights and feedback from stakeholders regarding CST. The goal was to determine the most suitable way to modify and adapt CST for older individuals with cognitive impairment in the Malaysian setting, thus ensuring the ecological validity of the adapted version. Eighteen key stakeholders, considered Subject-Matter Experts (SMEs), were invited to participate in two Focus Group Discussions (FGDs). The participants included a geriatric specialist, medical officer, nurse practitioners, occupational therapists, staff from an elderly institution, older persons with mild cognitive impairment, and caregivers. All participants had experience working with persons with dementia and were familiar with Malaysian culture. The FGD sessions lasted approximately 60 to 80 minutes. Prior to the group discussion, the participants were presented with information about a) The background of CST, b) the Components of CST and the activities in the CST/themes in sessions 1 – 14 in the CST, c) the CST Manual, d) Hands-on experience of selected sessions in CST (Session 1: Physical activity, Session 2: Sound, Session 4: Food, Session 6: Faces/scenes). They were also provided with hands-on experience in selected CST sessions. During the FGDs, participants critically examined the CST program, offering feedback on its practicality, cultural relevance, structure, and feasibility for older individuals in Malaysia. They also suggested modifications where necessary.

### 3.2 Phase 2: Integrating generated information with theory and empirical and clinical knowledge

The second phase involved synthesising the information generated from Phase 1 and integrating it with relevant theoretical frameworks, empirical knowledge, and clinical expertise. The FGD sessions were recorded, transcribed verbatim, and analysed using deductive thematic analysis. This analysis followed the six steps outlined by Braun and Clarke (2006), including gaining familiarity with the data, creating coding categories, generating themes, reviewing themes, labelling or naming themes, and finally, writing up the analysis to address the research objectives.

### 3.3 Phase 3: Reviewing the initial culturally adapted intervention with stakeholders and revising the culturally adapted intervention

The third phase reviewed and revised the initial culturally adapted CST intervention. This review assessed the adapted version's Content Validity Index (CVI). The CVI, an acceptable indicator for content validity, encompasses components such as relevance, clarity, simplicity, and ambiguity (Polit et al., 2007). A panel of ten health professionals familiar with CST evaluated the CST-M (Malaysian adapted version) using CVI forms. They assessed the manual and provided feedback on the suitability and relevance of activities and the clarity of instructions in each session (Introduction, Main activity, and Closing session). If an activity scored a 3 in terms of suitability/relevance or clarity of instructions, it was considered for revision. The health professionals' evaluations were used to calculate the content validity of each item (CVI-I) and the content validity index by the expert (CVI-E). Adjustments were made to account for random chance agreement (Pa) to ensure the accuracy and validity of the content validity index calculation. Additionally, a modified Kappa (K\*) value was calculated for each item using the formula ( $K^* = (CVI-I - Pa) / (1 - Pa)$ ). The K\* values were categorised as poor ( $K^* < 0.39$ ), moderate (0.40-0.59), good (0.60-0.74), and excellent ( $K^* > 0.74$ ) based on the evaluation criteria outlined by Polit et al. (2007).

### 3.4 Phase 4: Testing the culturally adapted intervention – Pilot study

The fourth phase involved conducting a pilot study to test the effectiveness of the culturally adapted intervention. A non-equivalent pretest-posttest quasi-experimental design was employed, focusing on the cognitive functions of older individuals with mild dementia. The pilot study took place in a government-funded elderly institution, and participants attended a 7-week CST-M program. At the end of the program, a focus group discussion was conducted to gather feedback and insights on the adapted version. The selection of participants followed specific inclusion and exclusion criteria outlined in Table 1.

Table 1. Inclusion Criteria

| Inclusion criteria |  | Exclusion criteria |  |
|--------------------|--|--------------------|--|
| i)                 | Older persons who are above 60 years old and above with either mild dementia                   | i)                 | Senior citizens who are suffering from major psychiatric disorders and inability to complete research questionnaires (for patients with significant blindness, speech disorders, severe deafness). |
| ii)                | Living in the institution for at least three months  | ii)                | The elderly suffer from life-limiting diseases such as cancer.   |
| iii)               | able to communicate with basic Bahasa Malaysia and   |                    |  |
| iv)                | Has attended and completed at least primary school education.                                  |                    |  |
| v)                 | Independent in Activity of Daily Living (ADL) – scores 90 and above in Modified Barthel Index. |                    |  |
| vi)                | No depression (scores less than five on Geriatric Depression Scale (GDS).                      |                    |  |
| vii)               | Mild dementia (Scores 1 for mild dementia in Clinical Dementia Rating Scale)                   |                    |  |

Recruitment occurred in public-funded elderly institutions, where eligible participants and their caregivers were approached. Detailed explanations about the program were provided to potential participants and caregivers, and consent forms were obtained before the study commenced. The CST-M program consisted of two weekly sessions, each lasting 60 minutes. The program's day, time, and venue were discussed and agreed upon with participants and caregivers to minimise attendance issues. Before starting the CST-M program, participants' cognitive functions were evaluated using the Malay version of the Loewenstein Occupational Therapy Cognitive Assessment - Geriatric (LOTCA-G). The LOTCA-G is a cognitive assessment battery comprising 23 subtests across seven cognitive areas. i.e. orientation, visual and spatial perception, praxis, visuomotor organisation, thinking operations and memory. Data from the pilot study were analysed using the Statistical Package for the Social Sciences (SPSS) Version 21. Normality tests were conducted using the Shapiro-Wilk test, indicating that the data were not normally distributed. Therefore, the Mann-Whitney U test was employed to determine significant differences between pre-and post-values, with an alpha level of 0.05.

### 3.5 Phase 5: Finalising the culturally adapted intervention

The final phase aimed to gather feedback from participants who took part in the pilot study of the CST-M program. A focus group discussion was conducted to explore their experiences and perspectives on attending the CST-M sessions. The duration of the focus group discussion was approximately 60 to 80 minutes. Participants were asked a series of semi-structured interview questions covering topics such as preferred and disliked activities, perceived usefulness of activities, recommendations for improvement, and other program-related matters (e.g., venue, attendance issues, duration, and timing). The focus group discussion was recorded, transcribed verbatim, and analysed using the six steps of deductive thematic analysis proposed by Braun and Clarke (2006).

## 4.0 Results

The brief results of the study on each phase are presented below.

### 4.1 Phase 1: Generating Knowledge and Collaborating with Stakeholders

Eighteen SMEs expressed their interest in the CST and were willing to participate actively in the session conducted. They discuss and critically examine the CST programme and comment on the practicality, cultural relevance, structure and feasibility of applying the sessions to older persons in Malaysia, and suggest modifications.

### 4.2 Results Phase 2: Integrating generated information with theory and empirical and clinical knowledge

Information from FGDs was synthesised and integrated with clinical experience specific to the Malaysian setting, with heavy consideration given to multiple factors such as multi-ethnicity in Malaysia, economic circumstances of the older people, geographical locations, transportation, living arrangements, and support. Changes were suggested to the structure and content of the sessions. Two main themes emerged from the interview transcripts: a) the structure of the session and b) the content of the sessions. The following are the suggestions from the SMEs:

#### Structure of Sessions

- Schedule sessions between 10 am and 1 pm for convenience.
- Conduct sessions in an informal manner.
- Address patients as "Pak Cik/Mak Cik or Atuk/Nenek, Untie/Uncle" to show respect and foster closeness.
- Perceive participants as group members rather than patients.
- Use common layman's words instead of formal terms.

- Encourage regular attendance by providing transportation services at a nominal cost.
- Provide a concise explanation of the treatment to gain support and facilitate transportation.
- Introduce a two-week induction period to familiarise participants with the centre.
- Begin sessions with tea and biscuits, allowing participants to bring their own food.
- Extend session duration to a minimum of 2-3 hours or combine sessions within 2 hours.
- Foster connections by having participants lunch together or organising a "*makan besar*" at the end of session 14.
- Provide a translated version of the CST manual with culturally appropriate activities.

Proposed changes for the content of the sessions:

- Session 2: Incorporate familiar sounds.
- Session 3: Focus on childhood memories and festivals instead of recreating a childhood bedroom.
- Session 4: Use local, seasonal food and familiar items like "*durian*," shrimp paste, "*budu*," or "*cincalok*" to stimulate the senses.
- Session 6: Include local and famous people from various ethnicities instead of scenes.
- Session 7: Use simple word association activities without the need for writing.
- Add traditional counting games, crossword puzzles, or charades to the 'Number Games' and word games sessions.
- Replace drawing or writing activities with ones involving placing or telling.
- Generate culturally relevant items for sessions like word associations, faces, scenes, and team quizzes.
- Replace meal planning and cooking activities with budgeting for ordering a meal delivery.
- Design and provide a standardised set of equipment and instructions for occupational therapists in Malaysia.

#### 4.3 Results Phase 3: Reviewing the initial culturally adapted intervention with stakeholders and revising the culturally adapted intervention

The cultural adaptations were reviewed by eight occupational therapists and two medical officers. Table 2 contains the CVI-I scores for each session. Twelve sessions (85.7%) had an Excellent CVI-I with scores above  $\geq 0.79$ , whilst two sessions (sessions 2 and 11) had good validity of CVI-I content with scores  $\geq 0.70$ . The CVI-E for each expert range between scores of 1.00 (five experts) and 0.60 (one expert) (Table 3)

Table 1. Content validity analysis by sessions.

| Session: Activity              | Number of experts who scores 3 or 4 | CV-I <sup>a</sup> | Pa <sup>b</sup> | K <sup>c</sup> | Evaluation |
|--------------------------------|-------------------------------------|-------------------|-----------------|----------------|------------|
| Session 1: Physical Activity   | 10                                  | 1.00              | 0.001           | 1.00           | Excellent  |
| Session 2: Sound               | 10                                  | 1.00              | 0.001           | 1.00           | Excellent  |
| Session 3: Childhood           | 7                                   | 0.70              | 0.117           | 0.66           | Good       |
| Session 4: Food                | 9                                   | 0.90              | 0.010           | 0.90           | Excellent  |
| Session 5: Current Affairs     | 9                                   | 0.90              | 0.010           | 0.90           | Excellent  |
| Session 6: Faces/Scenes        | 10                                  | 1.00              | 0.001           | 1.00           | Excellent  |
| Session 7: Word Association    | 10                                  | 1.00              | 0.001           | 1.00           | Excellent  |
| Session 8: Creativity          | 10                                  | 1.00              | 0.001           | 1.00           | Excellent  |
| Session 9: Categorising object | 9                                   | 0.90              | 0.010           | 0.90           | Excellent  |
| Session 10: Orientations       | 9                                   | 0.90              | 0.010           | 0.90           | Excellent  |
| Session 11: Using money        | 7                                   | 0.70              | 0.117           | 0.66           | Good       |
| Session 12: Number games       | 8                                   | 0.80              | 0.044           | 0.79           | Excellent  |
| Session 13: Words games        | 10                                  | 1.00              | 0.001           | 1.00           | Excellent  |
| Session 14: Team quiz          | 10                                  | 1.00              | 0.001           | 1.00           | Excellent  |

<sup>a</sup>CVI-I: Content validity per each item, <sup>b</sup>Pa: random likelihood agreement, <sup>c</sup>K\*: modified Kappa., <sup>d</sup>K\*applied evaluation criteria.

Table 3. Content validity index for each expert

| Experts   | Each session content validity index for each expert (CVI-E) |
|-----------|---|
| Experts 1 | 0.88  |
| Experts 2 | 1.00  |
| Experts 3 | 1.00  |
| Experts 4 | 0.92  |
| Experts 5 | 0.60  |
| Experts 6 | 0.86  |
| Experts 7 | 0.75  |
| Experts 8 | 1.00  |
| Experts 9 | 1.00  |
| Expert 10 | 1.00  |

#### 4.4 Results Phase 4: Pilot study

The socio-demographic characteristics of participants in this pilot study are shown in Table 4.

Table 4. Socio-demographic characteristics of participants

| Demographics                  | Experimental Group<br>(n/%) |
|-------------------------------|-----------------------------|
| Age                           |                             |
| 60 to 74 years old            | 15 (62.50)                  |
| Above 75 years old            | 9 (37.50)                   |
| Total                         | 24 (100)                    |
| Gender                        |                             |
| Male                          | 10 (41.67)                  |
| Female                        | 14 (58.33)                  |
| Total                         | 24 (100)                    |
| Race                          |                             |
| Malay                         | 15 (62.50)                  |
| Chinese                       | 5 (20.83)                   |
| Indian                        | 4 (16.67)                   |
| Others                        | -                           |
| Total                         | 24 (100)                    |
| Length of Stay in Institution |                             |
| 3 to 24 months                | 11 (45.83)                  |
| 25 to 48 months               | 7 (29.17)                   |
| 49 to 72 months               | 4 (16.67)                   |
| 73 to 96 months               | 2 (8.33)                    |
| Total                         | 24 (100)                    |

n = number of participants

Table 5. Differences in the score for LOTCA-G

| Domains and components in LOTCA-G    | Pre<br>Median (IQR) | Post<br>Median (IQR) | n  | u       | z       | p     | r    |
|--------------------------------------|---------------------|----------------------|----|---------|---------|-------|------|
| 1 <b>Orientation</b>                 |                     |                      |    |         |         |       |      |
| Orientation for Place                | 6.00 (5.25 – 6.75)  | 6.00 (6.00 – 7.00)   | 24 | 121.000 | - 1.29  | 0.03* | 0.45 |
| Orientation for Time                 | 4.00 (3.00 – 4.00)  | 4.00 (4.00 – 5.00)   | 24 | 68.500  | - 3.42  | 0.02* | 0.46 |
| 2 <b>Perception</b>                  |                     |                      |    |         |         |       |      |
| Visual Identification of Objects     | 4.00 (4.00 – 4.00)  | 4.00 (4.00 – 4.00)   | 24 | 118.000 | -0.52   | 1.00  |      |
| Visual Identification of Shapes      | 4.00 (4.00 – 4.00)  | 4.00 (4.00 – 4.00)   | 24 | 190.000 | - 0.69  | 0.55  |      |
| Overlapping Figures                  | 3.00 (3.00 – 4.00)  | 3.50 (3.00 – 4.00)   | 24 | 112.500 | - 0.65  | 0.03* | 0.32 |
| Object Constancy                     | 4.00 (4.00 – 4.00)  | 4.00 (4.00 – 4.00)   | 24 | 72.500  | - 2.32  | 0.02* | 0.43 |
| 3 <b>Spatial Perception</b>          |                     |                      |    |         |         |       |      |
| Directions on Body                   | 4.00 (4.00 – 4.00)  | 4.00 (4.00 – 4.00)   | 24 | 113.000 | 0.00    | 1.00  |      |
| Direction in Front                   | 4.00 (3.00 – 4.00)  | 4.00 (3.00 – 4.00)   | 24 | 112.500 | - 0.95  | 0.33  |      |
| Spatial Relations                    | 3.00 (2.00 – 4.00)  | 3.00 (2.00 – 4.00)   | 24 | 108.000 | - 0.53  | 0.55  |      |
| 4 <b>Praxis</b>                      |                     |                      |    |         |         |       |      |
| Motor Imitation                      | 3.00 (2.00 – 3.00)  | 3.00 (2.00 – 3.00)   | 24 | 121.500 | - 0.269 | 0.79  |      |
| Utilisation of Objects               | 4.00 (3.00 – 4.00)  | 4.00 (3.25 – 4.00)   | 24 | 116.000 | - 0.575 | 0.57  |      |
| Symbolic Actions                     | 4.00 (4.00 – 4.00)  | 4.00 (3.00 – 4.00)   | 24 | 125.000 | - 0.139 | 0.90  |      |
| 4 <b>Visuomotor Organization</b>     |                     |                      |    |         |         |       |      |
| Copy Geometric Forms                 | 3.00 (3.00 – 4.00)  | 3.50 (3.00 – 4.00)   | 24 | 110.00  | - 0.32  | 0.73  |      |
| Two Dimensional Model                | 3.00 (2.00 – 4.00)  | 3.00 (2.00 – 4.00)   | 24 | 127.00  | - 0.02  | 0.97  |      |
| Pegboard Construction                | 4.00 (3.00 – 4.00)  | 4.00 (3.00 – 4.00)   | 24 | 102.000 | - 0.65  | 0.83  |      |
| Block Design                         | 3.00 (3.00 – 4.00)  | 3.50 (3.00 – 4.00)   | 24 | 79.000  | - 1.82  | 0.75  |      |
| Reproduction of a Puzzle             | 3.00 (2.25 – 3.00)  | 3.00 (2.25 – 3.75)   | 24 | 118.00  | - 0.25  | 0.05* | 0.30 |
| Drawing a Clock                      | 3.00 (2.00 – 3.75)  | 3.00 (3.00 – 4.00)   | 24 | 77.00   | - 2.23  | 0.04* | 0.36 |
| 5 <b>Thinking Operations</b>         |                     |                      |    |         |         |       |      |
| Categorisation                       | 2.00 (2.00 – 3.00)  | 3.00 (2.00 – 3.00)   | 24 | 68.50   | - 2.32  | 0.02* | 0.42 |
| Pictorial Sequence                   | 3.00 (3.00 – 3.00)  | 3.00 (3.00 – 3.75)   | 24 | 102.50  | - 1.42  | 0.75  |      |
| 6 <b>Memory</b>                      |                     |                      |    |         |         |       |      |
| A Famous Personality                 | 3.00 (2.00 – 3.00)  | 3.00 (3.00 – 3.00)   | 24 | 110.50  | - 1.18  | 0.02* | 0.50 |
| A Personal Possession                | 3.00 (2.00 – 3.75)  | 3.00 (3.00 – 4.00)   | 24 | 96.000  | - 1.34  | 0.02* | 0.42 |
| Everyday Objects                     | 3.00 (3.00 – 3.00)  | 3.00 (3.00 – 4.00)   | 24 | 76.500  | - 2.20  | 0.05* | 0.30 |
| 7 <b>Attention and Concentration</b> |                     |                      |    |         |         |       |      |
|                                      | 3.50 (3.00 – 4.00)  | 4.00 (4.00 – 4.00)   | 24 | 36.500  | - 3.45  | 0.05* | 0.32 |

After seven weeks of intervention, all 24 participants completed the CST-M. The post-test results indicated that there is a significant difference in five domains of cognitive functions as measured by LOTCA-G such as orientation (orientation for time and place), perception (overlapping figures and objects constancy), visuomotor organisation (reproduction of puzzle and drawing a clock), thinking operations (categorisation), all component in memory (famous personality, personal possession and everyday objects), and attention and concentration before and after the CST-M at  $p < 0.05$  with effect sizes ranging from medium to large as shown in Table 5.

#### 4.5 Results Phase 5: Finalising the culturally adapted intervention

Thematic analysis indicates two superordinate themes emerged from FGD transcripts in relation to the engagement during the session and recommendations from the participants. Three themes emerged from the engagement sessions which are, 1) Enjoyable sessions, 2) Togetherness, Supports and encouragement, 3) cognitive stimulating sessions. Whilst the participants recommend to prolong the sessions up to 2 hours and providing incentives for participating in the sessions.

Furthermore, the CST-M team has developed standardised and easy-to-use equipment and materials for occupational therapists in Malaysia to facilitate regular and effective CST sessions for older individuals with dementia. The materials are designed to be reusable, allowing for repetitive use without compromising their quality, making them practical and cost-effective solutions for continuous therapy implementation.

## 5.0 Discussion

The global increase in the elderly population, particularly those affected by cognitive impairment and dementia, poses a significant challenge to healthcare systems worldwide. Non-pharmacological interventions have gained prominence as a preferable approach to reduced cognitive deterioration with fewer adverse side effects. CST has emerged as a promising intervention supported by strong evidence-based research. However, the original CST developed in the United Kingdom may need to be more culturally appropriate for diverse populations, necessitating adaptations and validations to enhance its effectiveness. This study discusses CST's cultural adaptation and validation process, mainly focusing on the Malaysian context.

The cultural adaptations of CST involved modifications to the structure and content of the sessions. The structure was tailored to align with Eastern values, emphasising cooperation and togetherness among participants. Interactive elements were incorporated to foster a sense of engagement and connectedness. Additionally, economic and geographical considerations were taken into account to ensure accessibility and relevance to the Malaysian context. Layman's terms were used during conversations to enhance comprehension and improve participant involvement. Content modifications aimed to integrate culturally relevant elements into the CST sessions. Local and seasonal Malaysian foods, traditional games, and culturally significant items were incorporated to provide a familiar and relatable context. By tapping into participants' cultural experiences, the adapted CST aimed to evoke nostalgia, facilitate cognitive stimulation, and foster a sense of connection and belonging.

The adapted CST-Malaysia version was met with enthusiasm from older individuals and health professionals. Their positive response indicated a willingness to engage in the therapy and highlighted the potential effectiveness of the culturally adapted intervention. Expert evaluations using the CVI showed agreement with the adapted version, further validating its cultural appropriateness. Results from the pilot study indicated the positive effect of CST-M on improving cognitive abilities in older adults. Participants enjoyed the sessions and actively engaged in cognitively stimulating activities. Their feedback provided valuable recommendations to refine the content and structure of the CST-M, ensuring its continued effectiveness.

The study's limitations include a small sample size in the pilot study, hindering generalizability. The short duration might not capture long-term effects, and cultural variability within Malaysia may influence the intervention's effectiveness. Further research with larger and diverse samples, extended duration, and consideration of cultural differences is necessary for more robust conclusions.

In conclusion, cultural adaptation and validation of CST are essential to ensure its effectiveness in diverse populations. The findings support the potential benefits of the adapted CST program for cognitive stimulation in older individuals in Malaysia. By embracing cultural adaptations, non-pharmacological interventions like CST can be better tailored to address the cognitive needs of older individuals with cultural sensitivity and inclusiveness. Further research should explore the sustained impact of culturally adapted CST in diverse populations and the integration of CST in comprehensive dementia care approaches for older individuals in various cultural settings.

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## Paper Contribution to Related Field of Study

This paper contributes to the field of Medicine and Health Sciences, especially in Alzheimer's research.

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