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Feature Article

Effect of traditional opera on older adults with dementia

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ABSTRACT

This study evaluates the effectiveness of traditional Chinese opera on older adults with dementia; those who met the inclusion criteria were categorized into intervention ($n = 21$) and control ($n = 22$) groups. Traditional Chinese opera was organized for the intervention group for 12 weeks. The Mini-Mental State Examination (MMSE), the Chinese version of the neuropsychiatric inventory (CNPI), and Quality of Life in Alzheimer's disease (QOL-AD) assessed the effectiveness at the pre-test stage and after 6 and 12 weeks of the intervention, and generalized estimated equation was used for statistical analysis. Statistically significant ($P < 0.05$) differences were observed between the intervention and control groups in terms of MMSE, CNPI, and QOL-AD. Traditional Chinese opera can potentially be an effective therapy for improving the cognitive function of older adults with dementia, reducing their behavioral and psychiatric symptoms and enhancing their quality of life.

Introduction

The prevalence of dementia has been increasing worldwide. Currently, the number of people with dementia in China is approximately 9.5 million, constituting 20% of total global dementia, and is projected to reach 16 million by 2030.[1] Dementia care requires a substantial share of total health care and social resources; therefore, it is recognized as a priority for related field research. As pharmacologic treatments have not demonstrated effective outcomes,[2] non-pharmacological interventions aiming to reduce the behavioral symptoms of the disease have become the focus of research.

Music therapy involves listening to music and singing songs. Such a therapy can modulate the factors involved in cognition and conduct, divert the attention of older adults to provoke emotional responses and modulate them, draw on different cognitive functions, and evoke movement patterns. Although language deteriorates over the course of the disease, some musical skills are still preserved, such as the ability to play a previously learned piece of music or a musical instrument. Responsiveness to music may be preserved even in late stages of dementia. A previous study has indicated that singing traditional songs, which emerged from the life experiences of people living with dementia, activates their implicit memory with a priming effect.[3] Moreover, it helps improve their memory as well as the coherence and expressiveness of their speech.[4]

Chinese opera drew upon songs and dances that were considered older traditions of entertainment and were derived from folk tales. It reflects individuality in commonality and includes folk songs, dances, rap, and burlesque. It also constitutes literature, music, dance, art, martial arts, acrobatics, and performing arts. Along with Greek tragedy and comedy and Indian Sanskrit opera, Chinese opera is known as one of the world's three oldest dramatic cultures. After a long period of development, Baihua Garden of Chinese opera gradually emerged, which includes the following five major types of operas at its core: Peking Opera, Vietnam Opera, Huangmei Opera, Judgment Opera, and Henan Opera. Thus, opera is the quintessence of China; it is a comprehensive stage art style with an extensive history that conforms to the social life background of people with dementia in China. The stimulation of long-term memories of people with dementia can cause an emotional resonance, thereby increasing their interest in life and enhancing compliance. Some studies have shown that treatments based on traditional music improve the cognitive ability of people with dementia.[5–7] This study explored the effect of traditional Chinese opera on the cognitive capacity, psychiatric and behavioral symptoms, and quality of life of older adults with dementia.

Materials and methods

Study design

A quasi-experimental design with a nonequivalent control group was used. Assessments were made before, during, and after the intervention. A pre-experiment with 18 participants was conducted to

Abbreviations: CDR, Clinical Dementia Rating; MMSE, Minimum Mental State Examination; CNPI, Chinese version of the Neuropsychiatric Inventory; QOL-AD, Quality of Life in Alzheimer's disease; BPSD, Behavioral and Psychiatric Symptoms of Dementia

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test and improve the intervention protocol. Based on the pre-experiment, easier traditional Chinese opera songs with lively rhythms and pleasant scenarios were selected for the formal intervention. A traditional opera program that met the preferences and reflected the background of older adults with dementia in China was developed according to a literature review, expert consultation, research, and preliminary experiments. Both the intervention and control groups were provided with routine nursing care.

Participants

Participants were recruited from the Hangzhou long-term care facility. The primary inclusion criteria included (1) diagnosis of dementia and its severity from mild to moderate and (2) patients aged 60 years and over. To ensure accuracy for item 1, each patient was screened using the Mini-Mental State Examination (MMSE)[8] and Clinical Dementia Rating (CDR).[9] Calculations of the MMSE scores were differentiated according to the patients' educational background (illiterate $\leq$ 19, primary school $\leq$ 22, and middle school $\leq$ 26), with a CDR value greater than 1. Additional inclusion criteria were as follows: (3) liked traditional Chinese operas; (4) had no hearing, visual, and/or physical disorders; (5) were capable of ensuring effective communication, understanding, and performing simple operational tasks; and (6) consented to participate in this study. The exclusion criteria were (1) severe dementia, (2) acute severe psychiatric or physical disease, and (3) deaf or aphasic patients having difficulty in understanding instructions during the intervention. Informed consents were signed by people with mild dementia, whereas consents for people with moderate dementia were provided by either a close relative or a legally authorized representative as a proxy. The intervention and control groups lived in different areas and were independent of each other to avoid sample contamination. This study was approved by the Hangzhou Normal University Ethics Committee.

From 63 potentially eligible residents, 44 residents were willing to consent to participate in this study. Hence, 44 older adults with dementia were recruited by convenience sampling. However, one older adult in the intervention group withdrew from the study owing to a movement disorder caused by severe rickets. Finally, the intervention group (n = 21) and control group (n = 22) resided in two independent areas. The patients in both the groups had dementia for 1–5 years, and the progression of dementia symptoms was stable.

Intervention

The intervention group received a structured group intervention of traditional opera for 12 weeks, twice a week, and each session lasted for 40 min. The intervention program was organized by two professionals skilled in traditional Chinese opera along with the researchers specializing in dementia studies. The selection of the traditional opera was based on the participants' age, background, interests, and hobbies, in addition to consultations with opera professionals.

The intervention program was divided into three phases. (1) Initial stage (first step, one week): We introduced opera-related stories, familiarized participants with each other, and explained the intervention procedure. (2) Intermediate stage (second step, 10 weeks): We set the theme of the traditional operas, which mainly comprised sharing stories, demonstrating drama, learning to sing, memorizing songs, and performing opera. (3) End phase (third step, one week): We reviewed, made recommendations to, and ended the intervention. The traditional opera intervention was observed to be interesting, and the participation compliance of the participants was satisfactory; the attendance rate was 94.8%. The detailed intervention plan is presented in Table 1.

Measures

The baseline demographic data were collected by the nursing staff of the Hangzhou long-term care facility, and the measures were completed by specially trained research assistants.

MMSE

The MMSE, developed by Folstein et al.,[8] is the most widely used cognitive screening scale worldwide. This study used MMSE to assess the participants' cognitive function.

This quick-to-administer questionnaire evaluates orientation in time and place, attention, verbal memory, language, and motor skills. The total score ranges from 0 to 30 points (orientation [0–10], memory [0–6], attention [0–5], and language/motor skills [0–9]). A higher score indicates better cognitive function. We adopted the cutoff score for a diagnosis of dementia developed by the Alzheimer's Disease (AD) group of the Department of Neurology, Peking Union Medical College Hospital, according to the participants' educational level: illiterate $\leq$ 19 points, primary school $\leq$ 22 points, and middle school $\leq$ 26 points.

Chinese version of the neuropsychiatric inventory (CNPI)

A part of the CNPI measures the symptoms (Cronbach α = 0.69) and another measures the distress of the caregiver (Cronbach α = 0.72)[10–12]; This study only used the part that measures the symptoms. The CNPI assesses behavioral function in 12 domains: delusions, hallucinations, depression, agitation, irritability, aberrant motor behavior, anxiety, aggressiveness, apathy, disinhibition, sleep behavior, and eating disorders. The frequency of each symptom is scored on a 4-point scale, whereas severity is scored on a 3-point scale. The scores range from 0 to 12 points per item, and the total score is obtained by the sum of all the 12 items.

Quality of life in Alzheimer's disease (QOL-AD)

The QOL-AD was designed by Rebecca G. Logsdon[13] in 1996 to measure the quality of life of people with Alzheimer's. In 2011, it was translated into Chinese by Yongmei et al.[14] The Cronbach α coefficient is 0.835. QOL-AD comprises 13 items that assess behavioral ability, physiological function, mental state, and interpersonal environment. The total QOL-AD score ranges from 13 to 52, 13 being the cutoff value. Those scoring more than 13 have a higher quality of life.

Table 1
The activity plan.

Pre-activity	Activity	End of the activity
Greeting each other; reviewing the songs and actions	Introduce the story background or scenario of the selected traditional opera. Such as *Wo jia you ge xiao jiu mei, Tian shang diao xia ge lin mei mei*, etc., to guide the older adults about the "Liang Zhu," "Dream of Red Mansions," and other stories; learn this song, including the memorization of the lyrics, tunes, and movements.	Encourage participants to introduce the background story and scenario of the song again. According to their participation in the session, the group will be required to perform the learned opera in the next session and inform the arrangement of the next session.

Table 2
Comparison between the intervention and control groups' baseline characteristics of participants treated with traditional opera ($N = 43$).

		IG ($n = 21$) $M \pm$ SD/MD	CG ($n = 22$) $M \pm$ SD/MD	$t/x^2/z$	P
Age (years)		83.00 ± 5.03	85.18 ± 5.59	−1.341	0.19
Gender	Male (NO.(%))	6 (28.57)	5 (22.73)	0.192	0.19
	Female (NO.(%))	15 (71.43)	17 (77.27)		
Educational background	No schooling (NO.(%))	4 (19.05)	3 (13.64)	4.972	0.62
	Primary educated (NO. (%))	10 (47.62)	12 (54.55)		
	Secondary school (NO.(%))	6 (28.57)	2 (9.09)		
	Above secondary school (NO.(%))	1 (4.76)	5 (22.73)		
Degree of dementia	Mild (NO.(%))	10 (47.62)	9 (40.91)	0.202	0.19
	Moderate (NO.(%))	11 (52.38)	13 (59.09)		
MMSE		11.52 ± 3.39	11.45 ± 2.22	−0.0491	0.96
CNPI		24.81 ± 7.12	23.77 ± 5.25	0.5451	0.56
QOL-AD		19.86 ± 2.46	20.45 ± 2.94	−0.7213	0.48

IG: Intervention group; CG: Control group; $P < 0.05$: the difference is statistically significant; 1 is the value of t; 2 is the value of x^2; 3 is the value of z; M: mean; SD: standard deviation; MD: median; MMSE: Mini-Mental State Examination; CNPI: Chinese version of the neuropsychiatric inventory; QOL-AD: Quality of Alzheimer patients' life.

Statistical analysis

Descriptive analysis was performed to calculate the scores of each measurement scale. Comparisons of the intervention and control groups at baseline for the demographic data and the scores on the MMSE, CNPI, and QOL-AD were achieved using paired sample t-test, chi-squared test, and Wilcoxon signed-rank test. Generalized estimated equation was used to compare the differences in MMSE, CNPI, and QOL-AD scores. Statistical analysis was performed using SPSS version 20.

Results

Prior to the intervention, the baseline data between the intervention and control groups were compared. No statistically significant difference was observed in the age, gender, educational background, and dementia levels between the two groups as baseline evaluations indicated ($P > 0.05$) (Table 2).

After 12 weeks of the intervention program, the difference in the MMSE scores between the intervention and control groups was statistically significant ($P < 0.05$) in the domains of memory and recall (Table 3).

The different CNPI scale scores between the intervention and control groups were statistically significant ($P < 0.05$) in the domains of depression, anxiety, irritability, aberrant motor behavior, and eating disorders. Interaction was observed between the results of CNPI and intervention time (Table 4).

The differences in the QOL-AD scores between the intervention and control groups were statistically significant ($P < 0.05$) in the domains of emotions, compatibility with friends, and entertainment capability. There was an interaction with the intervention time (Table 5).

Discussion

This study demonstrates that our intervention was potentially beneficial to the cognitive functions and domains of memory and recall of older adults with dementia ($P < 0.05$). The results were consistent with the findings of Särkämö et al.,[15] and there was an interaction between the results of the recall and intervention time. Additionally, Chu et al.[16] had conducted music therapy on 36 older adults with mild and moderate dementia, and the results showed an improvement in their cognitive functions. The results of this study were not in line with those of the study conducted by Tang et al.[17] that did not report a statistically significant improvement in the cognitive functions. In Tang et al.'s study, older adults people with dementia listened to music, sang nostalgic songs, and played musical instruments that were predetermined by researchers. This study asked participants to select traditional Chinese operas in advance,

Table 3
Analysis results of generalized estimated equations of MMSE scores of the intervention and control groups.

				95% CI		Hypothesis testing		
Variable	Parameter	B	SE	Lower	Upper	Wald X^2	df	p
MMSE	IG	1.78	0.52	0.76	2.80	11.74	1	0.00
	CG	0[a]	.	.	.	.	.	.
	Before	−1.00	0.64	−2.25	0.25	2.47	1	0.12
	6 weeks	−0.67	0.64	−1.92	0.57	1.12	1	0.29
	12 weeks	0[a]	.	.	.	.	.	.
Memory	IG	0.80	0.18	0.46	1.14	21.03	1	0.00
	CG	0[a]	.	.	.	.	.	.
	Before	0.05	0.21	−0.37	0.47	0.05	1	0.83
	6 weeks	−0.05	0.21	−0.47	0.37	0.05	1	0.83
	12 weeks	0[a]	.	.	.	.	.	.
Recall	IG	0.43	0.10	0.23	0.63	17.21	1	0.00
	CG	0[a]	.	.	.	.	.	.
	Before	−0.51	0.13	−0.76	−0.27	16.47	1	0.00
	6 weeks	−0.26	0.13	−0.50	−0.01	4.12	1	0.04
	12 weeks	0[a]	.	.	.	.	.	.

IG: Intervention group; CG: Control group; B: Regression coefficient; SE: Standard error.

Table 4
Analysis results of generalized estimated equations of CNPI scores of the intervention and control groups.

				95% CI		Hypothesis testing		
Variable	Parameter	B	SE	Lower	Upper	Wald X^2	df	*p*
CNPI	IG	−4.18	1.10	−6.33	−2.03	14.45	1	0.00
	CG	0[a]	.	.	.	.	.	.
	Before	5.61	1.34	2.97	8.24	17.32	1	0.00
	6 weeks	3.88	1.35	1.24	6.52	8.32	1	0.00
	12 weeks	0[a]	.	.	.	.	.	.
Depression	IG	−0.89	0.42	−1.72	−0.06	4.38	1	0.04
	CG	0[a]	.	.	.	.	.	.
	Before	0.88	0.52	−0.13	1.90	2.90	1	0.09
	6 weeks	0.05	0.52	−0.97	1.06	0.01	1	0.93
	12 weeks	0[a]	.	.	.	.	.	.
Anxiety	IG	−1.30	0.40	−2.09	−0.51	10.39	1	0.00
	CG	0[a]	.	.	.	.	.	.
	Before	1.16	0.49	0.20	2.123	5.57	1	0.02
	6 weeks	0.23	0.49	−0.73	1.20	0.22	1	0.64
	12 weeks	0[a]	.	.	.	.	.	.
Irritability	IG	−1.24	0.38	−2.00	−0.49	10.48	1	0.00
	CG	0[a]	.	.	.	.	.	.
	Before	0.42	0.47	−0.50	1.34	0.79	1	0.37
	6 weeks	0.42	0.47	−0.88	0.97	0.01	1	0.92
	12 weeks	0[a]	.	.	.	.	.	.
Aberrant motor behavior	IG	0.88	0.35	0.20	1.56	6.43	1	0.01
	CG	0[a]	.	.	.	.	.	.
	Before	0.28	0.42	−0.55	1.11	0.43	1	0.51
	6 weeks	0.28	0.42	−0.55	1.11	0.43	1	0.51
	12 weeks	0[a]	.	.	.	.	.	.
Eating disorders	IG	1.48	0.39	0.71	2.25	14.11	1	0.00
	CG	0[a]	.	.	.	.	.	.
	Before	0.33	0.48	−0.62	1.27	0.46	1	0.50
	6 weeks	0.19	0.48	−0.76	1.13	0.15	1	0.70
	12 weeks	0[a]	.	.	.	.	.	.

IG: Intervention group; CG: Control group; B: Regression coefficient; SE: Standard error.

which were related to their preference and life experiences. Familiar songs rooted in the participants' cultural background and life experiences helped in long-term memory recall and expression of emotions. Participants are more proactive when they are embedded in a familiar atmosphere. The cognitive region of the brain is stimulated by repeated recall and the identification of old songs and lyrics.[18] From this perspective, the recall and memory of older adults with dementia may have improved. Therefore, it is recommended that future research in music therapy should select active interventions with national traditions as a theme, and music should be selected according to the preferences of the concerned people with dementia.

This study included the action learning of opera, which is a beneficial physical exercise and is potentially useful in stimulating blood circulation in the brain. The prevalence of neuropsychiatric symptoms in dementia is considered to be 80%–90%, with more than 80% of these symptoms persisting for at least 18 months,[19] placing a

Table 5
Analysis results of generalized estimated equations of QOL-AD scores of the intervention and control groups.

				95% CI		Hypothesis testing		
Variable	Parameter	B	SE	Lower	Upper	Wald X^2	df	*p*
QOL-AD	IG	0.23	0.09	0.06	0.41	7.11	1	0.01
	CG	0[a]	.	.	.	.	.	.
	Before	−0.44	0.11	−0.65	−0.23	16.94	1	0.00
	6 weeks	−0.37	0.11	−0.58	−0.16	12.01	1	0.00
	12 weeks	0[a]	.	.	.	.	.	.
Emotions	IG	0.40	0.10	0.20	0.59	15.55	1	0.00
	CG	0[a]	.	.	.	.	.	.
	Before	−0.47	0.12	−0.71	−0.23	14.36	1	0.00
	6 weeks	−0.19	0.12	−0.43	−0.06	2.30	1	0.13
	12 weeks	0[a]	.	.	.	.	.	.
Compatibility with friends	IG	0.23	0.09	0.06	0.41	7.11	1	0.01
	CG	0[a]	.	.	.	.	.	.
	Before	−0.44	0.11	−0.65	−0.23	16.94	1	0.00
	6 weeks	−0.37	0.11	−0.58	−0.16	12.01	1	0.00
	12 weeks	0[a]	.	.	.	.	.	.
Entertainment capability	IG	0.43	0.08	0.29	0.58	32.92	1	0.00
	CG	0[a]	.	.	.	.	.	.
	Before	−0.40	0.09	−0.58	−0.21	18.31	1	0.00
	6 weeks	−0.37	0.09	−0.55	−0.19	16.22	1	0.00
	12 weeks	0[a]	.	.	.	.	.	.

IG: Intervention group; CG: Control group; B: regression coefficient; SE: Standard error.

heavy burden on caregivers and families. The results of this study showed that traditional opera is potentially beneficial in decreasing behavioral and psychiatric symptoms of dementia (BPSD) ($P < 0.05$), particularly in the domains of depression, anxiety, irritability, aberrant motor behavior, and eating disorders. These results are consistent with the results of some previous studies,[20–22] which have demonstrated that ethnic traditional music interventions can prove to be helpful in decreasing BPSD. Depression is a common symptom of BPSD and can accelerate the decline of cognitive function. By stimulating the cerebral limbic system associated with emotion, music intervention can regulate the function of the cerebral cortex and release endorphins and the sense of pleasure in the body.[23–24] All these factors play a crucial role in alleviating depression and anxiety. According to some studies,[16,25–27] traditional music alleviates the depressive symptoms of people with dementia. We selected operas that were consistent with the cultural background of the participants. This was conducive to soothing emotions, stimulating thought, promoting nonverbal communication, and improving the capacity for social interaction to relieve depression and irritability. This finding has also been supported by Liao et al.,[28] who reported that two weeks of nostalgic Taiwanese language songs improved the negative mood of people with dementia. The author suggested that diverse and interesting intervention content that can meet people's needs for social interaction and entertainment is important as it helps improve their psychiatric and behavioral symptoms.

The results of the present study demonstrated statistically significant differences ($P < 0.05$) between the intervention and control groups in terms of quality of life, emotion, compatibility with friends, and entertainment capabilities, which are similar to the results of Christina et al.[29] Music therapy using traditional operas was found beneficial in relieving disturbing emotions. Furthermore, group activities promote mutual communication among people and help establish friendship, and engagement in recreational activities is helpful for inner peace and self-identity. Solé et al.[30] indicated that although people with dementia reported an improvement in their quality of life, it was not statistically significant. One possible reason may have been the lack of specific measurement tools used in their study for the people with dementia. The present study applied a sensitive assessment tool, and the target group was older adults with moderate and mild dementia. Traditional opera was beneficial for stimulating fragments of memories of the participants' past life, experiencing satisfaction and self-affirmation, and improving social skills that enhance the quality of life.[20] This study also shows the same aforementioned outcome.

This study recruited participants from nursing homes that offered group sessions, and it may not be generalizable to people with dementia in a wider community. This study was quasi-experimental and was not randomized. Furthermore, owing to the limitation of objective conditions and research cost, this study did not investigate the video recording of the intervention process and the sustained effect of intervention.

Conclusion

This study demonstrated that a traditional Chinese opera is potentially beneficial in improving the cognitive function of older adults with mild and moderate dementia, decreasing BPSD, and improving their quality of life. To this end, it was critical to involve patients with dementia with an interest in traditional opera, who were able to propose a favorite opera. Operas with an energetic rhythm and a pleasant scenario were preferred. Group interventions were structured to promote communication and enhance social interaction skills.

Declaration of Competing Interest

None.

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Supplementary materials

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