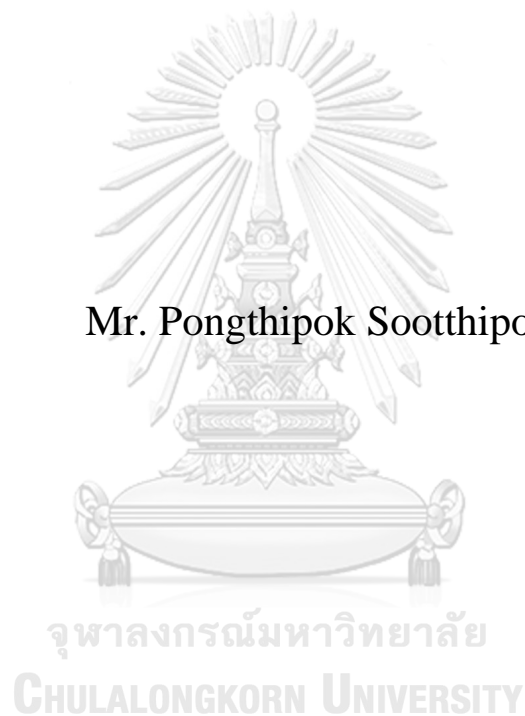


An Analysis of Group Singing Intervention for Patients with
Dementia: A Scoping Review of the Literature

Mr. Pongthipok Sootthipong



An Independent Study Submitted in Partial Fulfillment of the
Requirements
for the Degree of Master of Arts in Music Therapy
Inter-Department of Arts Program in Music Therapy
GRADUATE SCHOOL
Chulalongkorn University
Academic Year 2022
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สารนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
สาขาวิชาดนตรีบำบัด สหสาขาวิชาดนตรีบำบัด
บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2565
ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Independent Study Title	An Analysis of Group Singing Intervention for Patients with Dementia: A Scoping Review of the Literature
By	Mr. Pongthipok Sootthipong
Field of Study	Music Therapy
Thesis Advisor	Associate Professor PORNPRAPIT PHOASAVADI, Ph.D.
Thesis Co Advisor	Professor JINHYUNG LEE, Ph.D.

Accepted by the GRADUATE SCHOOL, Chulalongkorn University in
Partial Fulfillment of the Requirement for the Master of Arts

INDEPENDENT STUDY COMMITTEE

.....	Chairman
(Professor BUSSAKORN BINSON, Ph.D.)	
.....	Advisor
(Associate Professor PORNPRAPIT PHOASAVADI, Ph.D.)	
.....	Thesis Co-Advisor
(Professor JINHYUNG LEE, Ph.D.)	
.....	Examiner
(Nipat Pichayayothin, Ph.D.)	



จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

พงศิธิปก สุทธิพงศิ : . (An Analysis of Group Singing Intervention for Patients with Dementia: A Scoping Review of the Literature) อ.ที่ปริกษาหลัก : ศศ.
 ดร.พรประพิตร ฝาศวสิศ, อ.ที่ปริกษารวม : ศ.จิน ฮยอง ลี

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สาขาวิชา ดนตรีบำบัด
 ปีการศึกษา 2565

ลายมือชื่ออนิสิต
 ลายมือชื่อ อ.ที่ปริกษาหลัก
 ลายมือชื่อ อ.ที่ปริกษารวม

6488097820 : MAJOR MUSIC THERAPY

KEYWORD Scoping review, music therapy, dementia, group singing, choir
D:

Pongthipok Sootthipong : An Analysis of Group Singing Intervention for Patients with Dementia: A Scoping Review of the Literature. Advisor: Assoc. Prof. PORNPRAPIT PHOASAVADI, Ph.D. Co-advisor: Prof. JINHYUNG LEE, Ph.D.

Music therapists frequently provide services to individuals with dementia. Music therapists employ various techniques such as instrumental playing, improvisation, music listening, and group singing to decelerate cognitive declines, promote social interaction, enhance the quality of life and provide emotional and physiological support to aid in managing symptoms related to dementia. Group singing is one of the most frequently employed music interventions with the elderly population, owing to its multifaceted benefits. In fact, a number of clinical studies have been conducted to examine the impact of group singing on patients with dementia. Given the broad range of approaches and strategies employed in implementing group singing in music therapy, a comprehensive review is warranted. Therefore, this scoping review was conducted to analyze the existing music therapy literature on group singing interventions for patients with dementia, with the aim of gaining a deeper understanding of the specific intervention goals, methods, and strategies employed. For this, a thorough search of three scholarly databases and hand-search of seven music therapy journals were conducted. From this search, 17 articles were identified and analyzed. Upon analysis, it was discovered that group singing interventions in music therapy for individuals with dementia were employed to address specific goals under cognitive, emotional, social, physiological, and behavioral domains. Furthermore, corresponding intervention strategies were derived from the data. These specific group singing methods and their corresponding strategies were subsequently explored. Additionally, the review offers discussion on the need for future research and limitations of this review.

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Field of Study: Music Therapy

Student's Signature

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Academic 2022

Advisor's Signature

Year:

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Co-advisor's Signature

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ACKNOWLEDGEMENTS

I would like to acknowledge and give my most sincere appreciation to my advisor, Associate Professor Dr. Pornprapit Phoasavadi, and my co-advisor, Professor Dr. Jin-Hyung Lee. Without their guidance and encouragement, this work would not be possible. I would also like to thank the Chair and external examiner, Professor Dr. Bussakorn Binson, and Professor Dr. Nipat Pichayayothin for their kind suggestions and in pushing my paper towards a greater standard during the defense.

I would also like to thank my mom, Boonya Sootthipong, my dad, Pongthep Sootthipong, my sister, Pongyada Sootthipong, and all other family members for their words of encouragement and unwavering support throughout the process of writing this independent study.

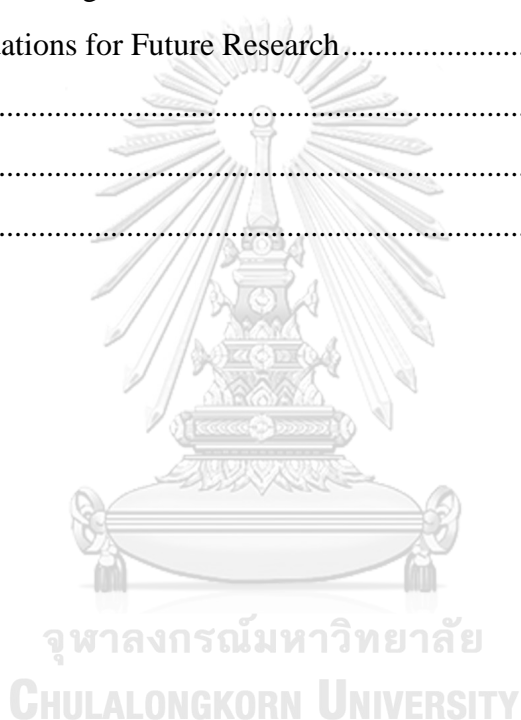
Finally, I would like to thank my peers in the Masters of Arts in Music Therapy Programme at Chulalongkorn University, Bangkok for their invaluable advice and support throughout this period of time.

Pongthipok Sootthipong

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CHAPTER 1

INTRODUCTION

In terms of dementia's impact on society, according to a report done by the World Health Organization [WHO] in 2021, there are approximately 50 million people suffering from dementia around the world, in which the number of persons with dementia will increase to around 152 million people by 2050 (WHO, 2023). The report further stated that dementia significantly impacts every aspect of a person's life including the psychological, social, emotional, and financial burden that the disease presents (WHO, 2023).

Persons diagnosed with dementia experiences neuropsychiatric symptoms, and cognitive symptoms (*Dementia*, 2022; Finkel et al., 1996). Cognitive symptoms in which a person with dementia may experience include memory loss, communication difficulties, visuospatial disorientation, judgement issues, loss of activities of daily living, difficulties in performing complex tasks, difficulties in motor and movement coordination. (*Dementia* 2022). Neuropsychiatric symptoms in which a person with dementia may experience are behavioral, including repetitive questioning, and aggression, and psychological, including depressions and anxieties (Finkel et al., 1996). Neuropsychiatric symptoms in person with dementia usually present challenges to the individual, as well as their caregiver, family, and their health services (Finkel et al., 1996). In a systematic review by Cooper et al. (2007), Five studies reported a high prevalence of anxiety disorders amongst caregivers of persons with dementia.

A typical treatment for people with dementia usually includes medication, cognitive training, and physical activity and exercise as interventions (Livingston et

al., 2020). In terms of pharmacological interventions, Cholinesterase inhibitors are used to improve cognition and activities of daily living in persons with moderate to severe Alzheimer's Disease. However, due to its perceived limited efficacy, this drug is being replaced or complemented by various alternative interventions. (Livingston et al., 2020). Furthermore, the use of medication also risks the persons with dementia to side effects such as nausea, vomiting, diarrhea, appetite problems, insomnia, physical fatigue, mental fatigue, headaches, itching, dizziness and faintness, hallucinations, and agitations (Society, 2018). Among many complementary non-pharmacological treatment options, one of the frequently recommended approaches is music therapy (AMTA, 2005).

The live, individualized aspect of music therapy presents itself as bearing positive effects on behavior of persons with dementia (Wall & Duffy, 2013). In fact, in a literature review by Scales et al. (2018), the authors did a literature review of systematic review to identify and examine non-pharmacological treatments of neuropsychiatric symptoms in persons with dementia (Scales et al., 2018). The authors found music therapy to be one of the promising non-pharmacological psychosocial treatments for neuropsychiatric symptoms in persons with dementia. Furthermore, music therapy is shown to be an effective non-pharmacological intervention for maintaining and improving social, cognitive, and emotional skills, while decreasing behavioral symptoms (Brotons et al., 1997).

In a narrative synthesis systematic review by McDermott et al. (2012), the review aims to provide insight into “the possible mechanisms of actions of music therapy” to which 18 studies were selected for review (McDermott et al., 2013, p. 783). Among the reviewed studies, 15 were of quantitative type, and 3 were of mixed

methods or qualitative type. Upon analysis, 8 studies reported reduction in neuropsychiatric symptoms as their main outcome and has found music therapy to have an effect on short-term improvements in neuropsychiatric symptoms (McDermott et al., 2013). The use of familiar songs in music therapy plays a role in reducing anxiety in persons with dementia. Furthermore, the medium of music calls into focuses the attention, and provide stimulus in reminiscing with persons with dementia's past memories, the result of which reduces agitation, and anxiety (Martini de Oliveira, et al., 2015). The American Music Therapy Association (AMTA) defined the use of music therapy in older adults living with dementia as:

1. "A holistic approach that relies on individual strengths and needs, positively impacts mood, behavior, cognition and mobility" (AMTA, 2021).
2. "A multi-modal means of expression, both verbal and nonverbal" (AMTA, 2021).
3. "Sensory stimulation, personally engaging, validating and comforting" (AMTA, 2005).
4. "A source of meaningful experiences between the caregiver and their loved one" (AMTA, 2005).

Music therapy may not reverse the diagnosis, it maximizes the effectiveness of persons with dementia current functions (AMTA, 2005).

Group singing has a powerful potential as a treatment option for individuals with dementia. In order to assess the need for a scoping review on group singing in music therapy for individuals with dementia, a preliminary analysis of the literature was conducted. This analysis aimed to establish a rationale for the review and gain a brief overview of the literature. In a systematic review by Thompson et al. (2021), the

authors aimed to review the effect of group singing on persons with dementia and their caregivers (Thompson et al., 2021). The authors did a narrative synthesis of quantitative data, as well a thematic synthesis of qualitative data. After which, a meta-integration of themes was conducted, it was concluded that group singing provided positive experiences. This correlated with the outcomes measured in the studies of quantitative type (Thompson et al., 2021). However, this review did not specify music therapy as its inclusion criteria for intervention type. Nevertheless, this review showed that group singing is a non-pharmalogical intervention which is beneficial to persons with dementia.

During the preliminary search, the author found 3 studies that involved group singing for persons with dementia in music therapy contexts. In a study by Cho (2018), the author aimed to study the effects of music therapy by singing client preferred songs in group, and implemented quality of life as a measurement. The music therapist facilitated group singing of every song twice with piano accompaniment, followed by verbal discussions to allow participants to feel validated and connected, and to promote interaction among the participants (Cho, 2018).

Dassa & Amir (2014) aimed to study the role of singing songs familiar to the participants suffering from middle to late-stage Alzheimer's Disease. In this study, the authors selected 24 Israeli songs which were popular from the 1930s till 1950s with the rationale that these songs were the songs that the participants listened to when they were growing up (Dassa & Amir, 2014). The authors facilitated group singing accompanied by guitar and ended each song with lyric discussions (Dassa & Amir, 2014).

Lastly, a study by Mabire et al. (2022) aimed to investigate the feasibility of utilizing an inclusive choir in a dementia daycare center. The choir was facilitated by a music therapist who had an extensive background in teaching singing professionally (Mabire et al., 2022). The sessions consisted of choir rehearsal for a Christmas concert. Before the songs were sung, the facilitator played the soundtrack of the songs to assess whether the participants were able to recognize the song, after which the lyrics were handed out. There were no songs or lyrics discussion following the group singing (Mabire et al., 2022).

These examples demonstrate various approaches that can be used to facilitate group singing, each tailored to different goals. Considering such differences in the existing literature, conducting a scoping review on the range of group singing interventions provided to individuals with dementia can illuminate the specific purposes for which certain approaches were implemented, thereby providing valuable insights for clinicians. Yet, to the best of the author's knowledge, currently there is no published review solely focusing on the group singing intervention in music therapy for persons with dementia. Hence, the objective of this review is to aggregate and analyze music therapy studies that use group singing intervention for persons with dementia. For this purpose, the author chose to conduct a scoping review as the specific review method, as the purposes of a scoping review include "to identify the types of available evidence in a given field", and "to identify key characteristics or factors related to a concept" (Munn, et al., 2018, p. 3). Consequently, this scoping review will contribute: 1) to identify the methods of group singing intervention in music therapy conducted for persons with dementia, and 2) to find the specific

intervention strategies used to facilitate group singing intervention conducted for persons with dementia in music therapy.

1.1 Research Questions

The research questions for this study are:

1. What are the methods of group singing intervention conducted in music therapy for persons with dementia?
2. What are the specific intervention strategies used to facilitate group singing intervention conducted for persons with dementia in music therapy?

1.2 Definition of Terms

1.2.1 Dementia. The World Health Organization (WHO) defines Dementia as “a syndrome in which there is deterioration in cognitive function beyond what might be expected from the usual consequences of biological ageing” (WHO, 2023).

1.2.2 Alzheimer’s Disease. Alzheimer’s Disease is defined as “a degenerative brain disease that is caused by complex brain changes following cell damage. It leads to dementia symptoms that gradually worsen over time” (Alzheimer's Association, n.d.).

1.2.3 Neurodegenerative Disorder. “A type of disease in which cells of the central nervous system stop working or die” (National Cancer Institute, n.d.)

1.2.4 Music Therapy. Music therapy addresses patient’s wellness, stress, pain management, emotional expression, memory stimulation, communication improvement. Further to this, it improves physical rehabilitation through the use of clinical-evidenced based musical interventions to facilitate individualized goals within the bounds of a therapeutic relationship facilitated by a credentialed music therapist (AMTA, 2005)

1.2.5 neuropsychiatric disorder. “Neuropsychiatric disorder is a blanket medical term that encompasses a broad range of medical conditions that involve both neurology and psychiatry” (Wolfsdolf, 2021)



CHAPTER 2

METHODOLOGY

2.1 Scoping Review

Aims of scoping reviews are to identify, map, examine certain characteristics, or literature based on a concept, a scope, or a rapidly emerging topics of interest (Munn, 2018). The protocol for this scoping review was adapted from Arksey and O'Malley's (2015) methodological framework in creating a scoping study consisted of six stages. In chapter 1, problems were described, and research questions were identified. In chapter 2, the method of study selection was described including study sources, inclusion and exclusion criteria, and data extraction method. In chapter 3, results were shown according to the research questions. In chapter 4, discussions on the results were presented, and in chapter 5, conclusions of this scoping review were drawn. Table 1 shows how the Arksey and O'Malley's methodological framework was incorporated into this study.

The purpose of this scoping review was to examine and analyze group singing interventions in music therapy for persons with dementia with a focus on the goals of group singing for persons with dementia, methods of group singing in music therapy for persons with dementia and their specific intervention strategies.

Table 1*Comparing the Review Structure to Arksey & O'Malley's Framework*

Arksey & O'Malley's Framework	This review
Stage 1: identifying the research question	Chapter 1: introduction
Stage 2: identifying relevant studies	Chapter 2: methodology
Stage 3: study selection	Chapter 2: methodology
Stage 4: charting the data	Chapter 3: results
Stage 5: collating, summarizing, and reporting the results	Chapter 4: discussions & Chapter 5: conclusion

2.2 Data Sources and Search Strategy

The search for studies included in this scoping review were done through the university library's electronic databases and hand search of journals related to the music therapy. The databases searched included *Academic Search Ultimate*, *PubMed*, and *Science Direct*. Journals searched include *Arts in Psychotherapy*, *Journal of Music Therapy*, *British Journal of Music Therapy*, *Music and Medicine*, *Music Therapy Perspectives*, *Nordic Journal of Music Therapy*, and *Voices*.

In searching the literature, the search string used was (“singing” OR “group singing” OR “choir”) AND (“dementia” OR “Alzheimer’s Disease” OR “mild cognitive impairment”). The searches were exported and organized in *Zotero*, duplicates were searched and removed in *Microsoft Excel*, along with studies that did not meet the eligibility criteria. The literature found were then selected for review by relevance described in the inclusion and exclusion criteria.

2.3 Inclusion and Exclusion Criteria

The studies included in this scoping were identified according to the stated inclusion and exclusion criteria. The inclusion criteria were:

1. Studies of any designs (qualitative, quantitative, mixed methods).
2. Studies involving participants with dementia.
3. Studies involving group singing as a part of music therapy intervention.
4. Studies with music interventions provided by a credentialed music therapist.
5. Studies published from the year, 2000-2023.
6. Studies published in English.

Articles that were excluded in the studies were:

1. Studies of review types (systematic review, scoping review, review of the literature).
2. Studies that involve the use of individual intervention in music therapy for persons with dementia.

2.4 Data Extraction

Identified studies were catalogued using *the Microsoft Excel* spreadsheet. Data items were categorized into participant characteristics and intervention characteristics. This scoping review used some of the participant characteristics as listed in Tricco et al. (2018) guidelines on reporting systematic reviews and meta-analysis, as well as scoping review called *Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Review (PRISMA-ScR)*. These characteristics includes a description of the participants' age, diagnosis, number of participants in the study, format of participant groupings (i.e., individual participant, or dyads), and the facility that is used to provide the intervention. The second set of data items, intervention characteristics consist of 11 items. These items were derived and modified from Robb et al. (2010)'s Reporting Guidelines for Music-based Interventions. These items

include person selecting music, music, music delivery method, intervention strategies, setting, unit of delivery. This scoping review identify and analyze items including:

1. Purpose of intervention.
2. The type of singing intervention.
3. The format of the intervention (group vs individual).
4. The music selector.
5. Music chosen (s).
6. The music facilitation method.
7. The music facilitator.
8. Number of sessions in total.
9. Duration of session.
10. Number of sessions.
11. Intervention strategies.

CHAPTER 3

RESULTS

3.1 Study Selection Process

The author found a total of 552 studies from three electronic database search, and hand search of seven scholarly journals related to music therapy. Duplicates were checked, and copies of duplicates found on other sources are eliminated.

17 studies were selected for this review. 11 studies were of quantitative type, and 6 studies were of qualitative type. The studies were selected according to the inclusion and exclusion criteria. 535 articles were excluded from this review as they did not meet the inclusion and exclusion criteria (Figure 1). The selected studies were published globally, including Australia ($n=2$), China ($n=1$), France ($n=1$), Ireland ($n=1$), Israel ($n=1$), Japan ($n=2$), Mexico ($n=1$), South Korea ($n=1$), Taiwan ($n=1$), Turkey ($n=1$), United Kingdom ($n=1$), and United States of America($n=4$). The earliest publication from the selected articles was the year 2001, and the latest publication from the selected publication was the year 2023. Table 2 shows the participant characteristics of the selected studies.

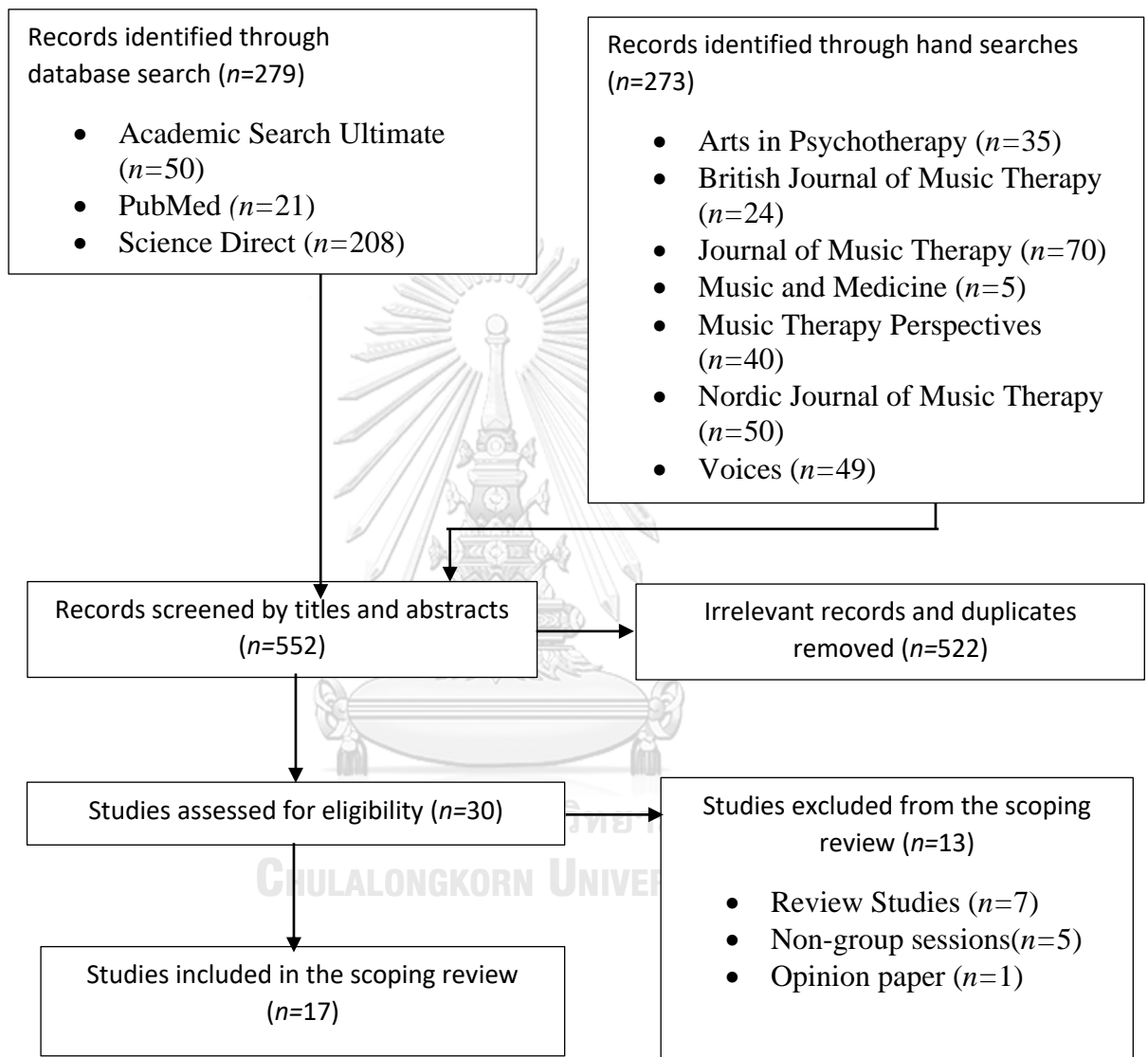
Figure 1*Flowchart of Literature Search Process*

Table 2*General Characteristics of included Studies*

Author(s), Year	Country	Study Type	Study Design
Baker et al., 2022	Australia	Quantitative	2x2 factorial clustered-RCT
Cevasco & Grant, 2003	United States	Quantitative	Two-folds, experimental
Dassa & Amir, 2014	Israel	Qualitative	Qualitative analysis
Dominiguez-Chávez et al., 2019	Mexico	Quantitative	RCT
Flo et al., 2022	Turkey	Quantitative	Parallel, Three-arm RCT
Groene et al., 2001	United States	Quantitative	Pre-post test, experimental
Hong & Choi, 2011	South Korea	Quantitative	Pre-post test, experimental
Lee et al., 2022	Ireland	Qualitative	Phenomenological Approach
Lyu et al., 2018	China	Quantitative	RCT
Mabire et al., 2022	France	Qualitative	Qualitative study
Powell, 2006	United Kingdom	Qualitative	Pilot Evaluation Study
Prieto Álvarez, 2022	United States	Quantitative	crossover-group design
Stegemöller et al., 2017	United States	Qualitative	Descriptive study
Takahashi & Matsushita, 2006	Japan	Quantitative	Pre-post test, experimental
Tanaka et al., 2015	Japan	Quantitative	Data Analysis
Thompson et al., 2023	Australia	Qualitative	Interpretative Phenomenological Analysis
Tz-Han et al., 2023	Taiwan	Quantitative	Pre-post test, experimental RCT

note. RCT = randomized controlled trial

3.2 Intervention Characteristics

The intervention characteristics extracted from the selected studies consisted of 4 items including the facilitator of the group singing session, music chosen for the group singing session, intervention duration, and the type of singing intervention.

Table 3 shows the intervention characteristics of the included studies.

In terms of facilitators, 9 studies used music therapist as the sole facilitator (Baker et al., 2022; Cevasco & Grant, 2003; Dassa & Amir, 2014; Domínguez-Chávez et al., 2019; Groene et al., 2001; Powell, 2006; Stegemöller et al., 2017; Takahashi & Matsushita, 2006; Thompson et al., 2023), 1 study used a neurologic music therapist (Prieto Álvarez, 2022), 1 study used music therapist trained in teaching singing (Mabire et al., 2022), 1 study used either music therapist or music therapy student or psychologist and psychology student with music therapy training, 4 studies did not identify the facilitator (Hong & Choi, 2006; Lyu et al., 2018; Tanaka et al., 2018; Tz-Han et al., 2023). In terms of music chosen, 5 studies used familiar songs (Baker et al., 2022; Flo et al., 2022; Groene et al., 2001; Prieto Álvarez, 2022, Takahashi & Matsushita, 2006), 3 studies selected by the era (Cevasco & Grant, 2003; Dassa & Amir, 2014; Lyu et al., 2018), 3 studies used seasonal or festive songs (Mabire et al., 2022; Takahashi & Matsushita, 2006; Tz-Han et al., 2023), 1 study used composition (Hong & Choi 2011), 1 study used songs suggested by music therapist (Lee et al., 2022), 1 study used musical pieces consisting two scales and five other songs (Tanaka et al., 2015), 1 study used the song, *You are my Sunshine*, and *Mairy Doats* (Stegemöller, 2017)(Stegemöller et al., 2017), 2 studies did not specify the music chosen (Domínguez-Chávez et al., 2019; Powell, 2006).

Methods of group singing intervention implemented include group singing session or choir ($n=5$), group music therapy ($n=4$), active reminiscence music therapy ($n=1$), group reminiscence music therapy ($n=1$), music-with-movement intervention ($n=1$), music, mood, and movement intervention ($n=1$), music therapy program employing song writing oriented activity ($n=1$), neurologic music therapy ($n=1$), singing lesson ($n=1$), and therapeutic group singing model ($n=1$).

Each selected studies addresses different goal areas such as behavioral goal area (Lyu et al., 2018; Prieto Álvarez, 2022; Tanaka et al., 2015; Tz-Han et al., 2023), cognitive goal area (Cevasco & Grant, 2003; Dassa & Amir, 2014; Domíniguez-Chávez et al., 2019; Flo et al., 2022; Groene et al., 2001; Hong & Choi, 2011; Lee et al., 2022; Lyu et al., 2018; Mabire et al., 2022; Prieto Álvarez, 2022; Takahashi & Matsushita, 2006), emotional goal area (Baker et al., 2022; Flo et al., 2022; Groene et al., 2001; Lee et al., 2022; Lyu et al., 2018; Prieto Álvarez, 2022; Takahashi & Matsushita, 2006; Tanaka et al., 2015; Tz-han et al., 2023), existential goal area (Flo et al., 2022; Lee et al., 2022; Lyu et al., 2018), physiological goal area (Domíniguez-Chávez et al., 2019; Stegemöller et al., 2017; Takahashi & Matsushita, 2006), and social goal area (Baker et al., 2022; Flo et al., 2022; Lee et al., 2022; Mabire et al., 2022). Table 3 shows the intervention characteristics of each study. Table 4 shows the goal areas in which each selected studies addressed as well as the purpose of each study.

Table 3*Intervention characteristics of included studies*

Author(s), Year	Facilitator(s)	Music Chosen(s)	Duration	Type of Singing Ix.
Baker et al., 2022	Music therapist	familiar song singing, music-stimulated reminiscence	45mins	Group music therapy
Cevasco & Grant, 2003	Music therapist	1900-1950s music	50mins	Music-with-movement intervention
Dassa & Amir, 2014	Music therapist	Popular songs from 1930s-1950s	45mins	Group music therapy
Domínguez-Chávez et al., 2019	Music therapist	n/a	1hr	Music, mood, and movement
Flo et al., 2022	Music Therapist/Student or Psychologist/Student with music therapy training	Familiar songs canon/polyphonic singing	45mins	Individual singing lessons combined with choir intervention
Groene et al., 2001	Music therapist	15 familiar songs	N/a	Group singing session
Hong & Choi, 2011	n/a	Composition	1hr	Music therapy program employing song writing oriented activities
Lee et al., 2022	Music therapist	Suggested by music therapist	1hr	Group singing session with flexible structure
Lyu et al., 2018	n/a	Favorite songs from age 20-30	30-40 mins	Group music therapy
Mabire et al., 2022	Singing teacher trained in music therapy	Christmas songs	1hr	Choir in preparation for Christmas concert

Table 3 (Continued)

Author(s), Year	Facilitator(s)	Music Chosen(s)	Ix. Duration	Type of Singing Ix.
Powell, 2006	Music therapist	n/a	N/a	Group music therapy
Prieto Álvarez, 2022	Neurologic music therapist	Familiar songs	50mins	Neurologic music therapy
Stegemöller et al., 2017	Music therapist	You are My Sunshine and Mairzy Doats	N/a	Group singing session
Takahashi & Matsushita, 2006	Music therapist	seasonal songs and familiar songs	N/a	Active reminiscence music therapy
Tanaka et al., 2015	n/a	Musical pieces used two scales and five songs	N/a	Group singing session
Thompson et al., 2023	Music therapist	participant-selected repertoire	90mins	Therapeutic group singing model
Tz-Han et al., 2023	n/a	Common cultural festival music	1hr	Group reminiscence music therapy

note. Ix. = intervention

Table 4*Goals and purposes of selected studies.*

Author(s), Year	Goal Areas	Purpose of Study
Baker et al., 2022	Emo Soc	Compare group music therapy versus recreational choir singing
Cevasco & Grant, 2003	Cog	Compare two methods of intervention and comparing responses to vocal versus instrumental music during exercise and exercise with instruments.
Dassa & Amir, 2014	Cog	“Explore the role of singing familiar songs in encouraging conversation among people with middle to late-stage AD”
Domínguez-Chávez et al., 2019	Cog Phy	“Feasibility and preliminary effects of a music therapy intervention on the global cognitive state and gait parameters in older adults with mild cognitive impairment (MCI)”
Flo et al., 2022	Cog Emo Exs Soc	Evaluate music therapy in AD patient using neuroimaging technology
Groene et al., 2001	Cog Emo	Compare live versus recorded music accompaniment style with singing and its effect on responsiveness behavior on individuals with dementia
Hong & Choi, 2011	Cog	Investigate the effectiveness of music therapy in the cognitive domain with the use of a song writing music therapy protocol.
Lee et al., 2022	Cog Emo Exs Soc	Investigate the impact of community-based group singing intervention on wellbeing in people with mild to moderate dementia.
Lyu et al., 2018	Beh Cog Emo Exs	Investigate the effects of music therapy on cognitive functions, and mental well-being in patients with AD
Mabire et al., 2022	Cog Soc	“Present the development of an inclusive choir in a day care center
Powell, 2006	n/a	Examine the experience of three music therapists.

Table 4 (Continued)

Author(s), Year	Goal Areas	Purpose of Study
Prieto Álvarez 2022	Beh Cog Emo	“Aimed to understand whether NMT techniques can be implemented with a rehabilitative approach for older adults with moderate to severe dementia.”
Stegemöller et al., 2017	Phy	“Solicit participants’ views of their involvement in a group singing intervention (GSI) led by credentialed music therapists”
Takahashi & Matsushita, 2006	Cog Emo Phy	Investigate the effects of music therapy in terms of emotional and physiological effect.
Tanaka et al., 2015	Beh Emo	Effects of music therapy on active behaviors and propose a new NIRS data analysis method for evaluating the effects of active behaviors.
Thompson et al., 2023	n/a	Understand the qualitative experience of a dementia choir group in Australia.
Tz-Han et al., 2023	Beh Cog Emo	“Examine the efficacy and feasibility of a reminiscence music therapy program on improving cognition and decreasing depressive and behavioral symptoms in older adults with dementia”

Note. Beh: behavioral; Cog: cognitive; Emo: emotional; Exs: existential; Phy: physiological; Soc: social; AD: Alzheimer’s Disease

3.3 Research Question 1

What are the methods of group singing intervention conducted for persons with dementia by music therapists?

Group singing intervention in persons with dementia addressed goal areas such as cognitive goals ($n=12$), social goals ($n=5$), emotional goals ($n=9$), physiological goals ($n=3$), and behavioral goals ($n=3$). 4 studies, including studies by Hong & Choi (2011), Cevalasco & Grant (2003), Dassa & Amir (2014), and Stegemöller et al. (2017), focus on a single goal area. Stegemöller et al. (2017) focuses on the physiological goal area, while Cevalasco & Grant (2003), Dassa & Amir (2014), and Hong & Choi (2011) focuses on the cognitive goal area. The rest of the studies ($n=11$) targeted two or more goals simultaneously. 2 studies, including studies from Powell (2006), and Tanaka et al. (2015), did not mention targeted goal areas. Goal areas were subdivided into intervention goals of treatment for persons with dementia. Table 5 shows the intervention addressed goals addressed by specific interventions categorized in goal areas.

Table 5*Specific Interventions Corresponding to Goal Areas*

Goal Areas	Intervention Goals	Specific Interventions	Author(s), Year		
Cognitive	Facilitate reminiscence	Group music therapy	Baker et al., 2022		
		Music-with-movement intervention	Cevasco & Grant, 2003		
		Group music therapy	Dassa & Amir, 2014		
		Singing session with flexibility depending on themes	Lee et al., 2022		
		Group music therapy	Lyu et al., 2018		
		Active reminiscence music therapy	Takahashi & Matsushita, 2006		
		Music therapy with singing intervention	Tanaka et al., 2015		
		Therapeutic group singing model	Thompson et al., 2023		
		Reminiscence music therapy group with singing of festive songs	Tz-Han et al., 2023		
		Maintain memory		Reminiscence music therapy group with singing of festive songs	Tz-Han et al., 2023
				Choir in preparation for Christmas concert	Mabire et al., 2022
				Neurologic music therapy with therapeutic singing intervention	Prieto Álvarez, 2022
				Music-with-movement intervention	Domíniguez-Chávez et al. 2019
				Song writing oriented music therapy program	Hong & Choi, 2011
				Active reminiscence music therapy	Takahashi & Matsushita, 2006

Table 5 (Continued)

Goal Areas	Intervention Goals	Specific Interventions	Author(s), Year
Cognitive (Continued)	Enhance language functions	Neurologic music therapy with therapeutic singing intervention	Prieto Álvarez, 2022
		Group music therapy	Lyu et al., 2018
		Group music therapy	Dassa & Amir, 2014
		Song writing oriented music therapy program	Hong & Choi, 2011
	Increase attention	Neurologic music therapy with therapeutic singing intervention	Prieto Álvarez, 2022
		Music-with-movement intervention	Domíniguez-Chávez et al., 2019
		Song writing oriented music therapy program	Hong & Choi, 2011
	Decelerate brain aging, Provide cognitive stimulation	Singalong sessions	Groene et al., 2001
		Singing lessons and choir practice	Flo et al., 2022
		Community-based group singing session with flexibility depending on themes	Lee et al., 2022
		Active reminiscence music therapy	Takahashi & Matsushita, 2006
	Orientate to Surroundings, Comprehend instructions	Neurologic music therapy with therapeutic singing intervention	Prieto Álvarez, 2022
		Song writing oriented music therapy program	Hong & Choi, 2011

Table 5 (Continued)

Goal Areas	Intervention Goals	Specific Interventions	Author(s), Year	
Cognitive (Continued)	Maintain executive function	Neurologic music therapy with therapeutic singing intervention	Prieto Álvarez, 2022	
Emotional	Increase self-expression	Group music therapy	Baker et al., 2022	
		Singing lessons and choir practice	Flo et al., 2022	
		Song writing oriented music therapy program	Hong & Choi, 2011	
		Singing session with flexibility depending on themes	Lee et al., 2022	
		Active reminiscence music therapy	Takahashi & Matsushita, 2006	
		Song writing oriented music therapy program	Hong & Choi, 2011	
	Reduce depressive symptoms		Singing session with flexibility depending on themes	Lee et al., 2022
			Active reminiscence music therapy	Takahashi & Matsushita, 2006
			Reminiscence music therapy group with singing of festive songs	Tz-Han et al., 2023
			Group music therapy	Baker et al., 2022
			Singing lessons and choir practice	Flo et al., 2022
			Singing session with flexibility depending on themes	Lee et al., 2022
Improve mood		Neurologic music therapy with therapeutic singing intervention	Prieto Álvarez, 2022	
		Active reminiscence music therapy	Takahashi & Matsushita, 2006	

Table 5 (Continued)

Goal Areas	Intervention Goals	Specific Interventions	Author(s), Year	
Emotional (Continued)	Maintain activities of daily living (ADL)	Group music therapy with singing	Lyu et al., 2018	
		Singing lessons and choir practice	Flo et al., 2022	
	Reduce neuropsychiatric symptoms	Group music therapy	Lyu et al., 2018	
	Increase affection	Singalong sessions	Groene et al., 2001	
	Increase sense of ego-integrity	Reminiscence music therapy group with singing of festive songs	Tz-Han et al., 2023	
	Decrease apathy	Neurologic music therapy with therapeutic singing intervention	Prieto Álvarez, 2022	
	Decrease anxiety	Neurologic music therapy with therapeutic singing intervention	Prieto Álvarez, 2022	
	Increase quality of life (QoL)	Singing lessons and choir practice	Flo et al., 2022	
	Physiological	Stabilize blood pressure	Active reminiscence music therapy	Takahashi & Matsushita, 2006
		Increase vocal volume	Group singing intervention	Stegemöller et al., 2017
Stabilize respiration		Group singing intervention	Stegemöller et al., 2017	
Improve gait		Music-with-movement intervention	Domíniguez-Chávez et al., 2019	
Behavioral	Decrease aggression	Group music therapy with singing	Lyu et al., 2018	
	Increase active behavior	Music therapy with singing intervention	Tanaka et al., 2015	
	Reduce behavioral symptoms	Reminiscence music therapy group with singing of festive songs	Tz-Han et al., 2023	

Table 5 (Continued)

Goal Areas	Intervention Goals	Specific Interventions	Author(s), Year
Social	Improve caregiver relationship	Music-with-movement intervention	Domíniguez-Chávez et al., 2019
	Increase creativity	Singing session with flexibility depending on themes	Lee et al., 2022

3.4 Research Question 2

What are the specific intervention strategies used to facilitate group singing intervention conducted for persons with dementia in music therapy?

This scoping review has found 11 specific intervention strategies that authors of the selected studies have used to facilitate group singing for persons with dementia. These intervention strategies include singing of familiar song ($n=8$), music-directed exercise ($n=7$), choir ($n=4$), song discussion ($n=4$), musical improvisation ($n=3$), concert preparation ($n=2$), the use of original or compositional music ($n=2$), vocal exercise ($n=2$), games ($n=1$), hello song ($n=1$), and social gathering after the music therapy session ($n=1$).

These specific intervention strategies can be categorized into intervention goals, including reminiscence ($n=9$), physical exercise ($n=6$), self-expression ($n=5$), life-long learning ($n=4$), promoting activities of daily living ($n=4$), promoting social interaction ($n=4$), and increasing ego-integrity ($n=2$). These intervention goals are then categorized into goal areas, including cognitive goal area, emotional goal area, social goal area, and physiological goal area.

Reminiscence or Music Reminiscence is an intervention goal that appears in the cognitive goal area. This strategic theme appears in Lee et al. (2022), Lyu et al. (2018), Thompson et al. (2023), Baker et al. (2022), Takahashi & Matsushita (2006),

Cevasco & Grant (2003), Dassa & Amir (2014), Tanaka et al. (2015), and Tz-Han et al. (2023).

Physical exercise is a physiological intervention goal that appears in Mabire et al. (2022), Thompson et al. (2023), Baker et al. (2022), Takahashi & Matsushita (2006), Cevasco & Grant (2003), Stegmöler et al. (2017), Domíniguez-Chávez et al. (2019).

Self-expression is an emotional intervention goal that appears in Flo et al. (2022), Lee et al. (2022), Baker et al. (2022), and Takahashi & Matsushita (2006), and Hong & Choi (2011).

Life-long learning is an intervention goal in the cognitive goal area. This strategic theme appears in Lee et al. (2022), Mabire et al. (2022), Thompson et al. (2023), and Hong & Choi (2011).

Activities of daily living is an intervention goal in the goal area of cognitive and social. This strategic theme appears in Flo et al. (2022), Lee et al. (2022), Mabire et al. (2022), and Takahashi & Matsushita (2006).

Social interaction is an intervention goal in the social goal area that appears in Flo et al. (2022), Lee et al. (2022), Mabire et al. (2022), Thompson et al. (2023).

Ego-integrity is an intervention goal in the realm of emotional goal area. This intervention goal appears in Flo et al. (2022), Prieto Álvarez (2022).

Specific intervention strategies according to each intervention goal can be found in table 6. Figure 2 shows an example of the flow between goal areas, into strategic themes, and into specific intervention strategies.

Figure 2
Relationship Between Intervention Strategies and Goal Areas

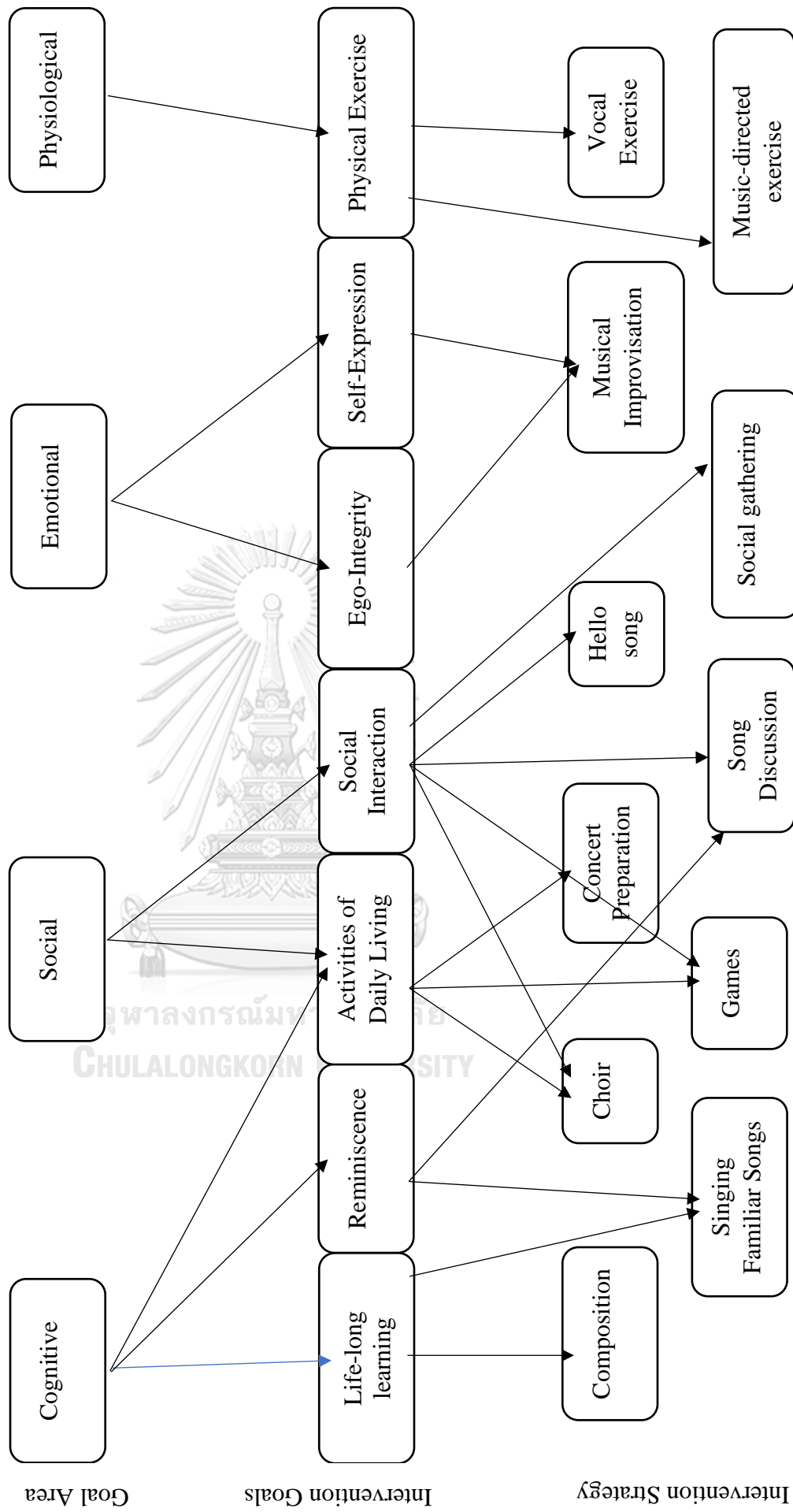


Table 6*Specific Intervention Strategies with Corresponding Objectives and Goals*

Goal Areas	Intervention Goals	Target outcomes	Specific Intervention Strategies	Author(s), Year
Cognitive	Facilitate reminiscence	Perceived level of psychosocial support	Familiar song sing-along and music-stimulated reminiscence.	Baker et al., 2022
		Responses during exercise with familiar vocal music	Reminiscence through music listening.	Cevasco & Grant, 2003
		Speech and singing quality	Memory evocation through song discussion.	Dassa & Amir, 2014
		Level of reminiscence	Familiar song sing-along and discussion.	Lee et al., 2022
		NPI score	Familiar/favorite song singing.	Lyu et al., 2018
		Cortisol level	Familiar/seasonal song singing	Takahashi & Matsushita, 2006
		n/a	Using original music to examine participant's recollection of familiar songs.	Tanaka et al., 2015
		n/a	Singing participant's selected songs.	Thompson et al., 2023
	Sense of ego-integrity		Reminiscence through singing and discussing cultural festive music.	Tz-Han et al., 2023

Table 6 (Continued)

Goal Areas	Intervention Goal	Target outcomes	Specific Intervention Strategies	Author(s), Year
Cognitive (Continued)	Provide life-long learning	MMSE items	Song writing, singing movement, games, and singing with instruments.	Hong & Choi, 2006
		Cognitive functioning	Singing with harmony lines, unfamiliar songs, and canons	Lee et al., 2022
		Musical memory	Learning new songs and sing songs from previous sessions	Mabire et al., 2022
		Cognitive functioning	Singing more challenging songs when appropriate	Thompson et al., 2023
		Quality of life	Singing lessons and choir practices	Flo et al., 2022
		Levels of social contributions	Participating in social warm up games	Lee et al., 2022
		n/a	Choir in preparation for Christmas concert	Mabire et al., 2022
		Cortisol level	Preparing for a concert	Takahashi & Matsushita, 2006

Table 6 (Continued)

Goal Areas	Intervention Goal	Target Outcomes	Specific Intervention Strategies	Author(s), Year
Social	Facilitate social interaction	Quality of life	Singing lessons and choir practices	Flo et al., 2022
		Levels of social contributions	Participating in social warm up games	Lee et al., 2022
		n/a	Name introduction in "hello" song	Mabire et al., 2022
		n/a	Afternoon tea session following the choir session.	Thompson et al., 2023
Social	Support ego-integrity	Sense of accomplishment	Singing lessons and choir practices	Flo et al., 2022
		Levels of disinhibition	Singing familiar songs according to the theme of the session.	Prieto Álvarez, 2022
Emotional	Promote self-expression	Depressive symptoms	Improvisation on percussion	Baker et al., 2022
		Levels of depressive symptoms	Singing lessons and choir practice	Flo et al., 2022
		Levels of self-expression	Expression of issues through song writing	Hong & Choi, 2011
		Levels of happiness and rejuvenation	Improvisation and song writing	Lee et al., 2022
		Cortisol level	Improvising on traditional Japanese drums	Takahashi & Matsushita, 2006

Table 6 (Continued)

Goal Areas	Intervention Goal	Target Outcomes	Specific Intervention Strategies	Author(s), Year
Physiological	Facilitate physical exercise	n/a	Exercise to vocal music vs. exercise to instrumental music, with and without instrumental accompaniment	Cévasco & Grant, 2003
		n/a	Warm up exercise for body and voice	Mabire et al., 2022
		Levels of non-musical behavior	Group singing intervention with exercises targeting vocal loudness, range, and elements of respiratory control	Stegmöler et al., 2017
		Systolic blood pressure	Directed movement to music	Takahashi & Matsushita, 2006
		n/a	Warm up exercise	Thompson et al., 2023

Note. NPI=Neuropsychiatric Inventory Score; MMSE=Mini Mental State Examination

CHAPTER 4

DISCUSSION

As a part of this discussion section, a summary of results will be presented, along with discussions based on the two research questions. In addition, three topics will be discussed based on the observations made during the synthesis of the 17 included studies.

4.1 Summary of Results

The objective of this scoping review was to analyze different methods of group singing intervention in music therapy conducted for persons with dementia. Out of 552 studies found in 3 online databases, and 7 music therapy journals, 17 studies were selected based on the inclusion and exclusion criteria set forth for this scoping review. These studies ($n=17$) were conducted all around the world, including countries from Asia, Europe, Middle East, Latin America, North America, and Oceania, with the greatest number of studies coming from North America.

The average age of participants in these studies ($n=17$) was 78 years old. The most common diagnosis ($n=17$) was dementia ($n=10$). Out of 10 studies, 4 studies did not specify the severity of dementia condition, 1 study involved participants with all severity levels of condition. 3 studies specified moderate to severe dementia as their diagnosis criteria. Furthermore, 1 study included participants with additional diagnosis, including Parkinson's Disease, and Alzheimer's Disease. The review identified 10 methods of group singing intervention in music therapy for persons with dementia. Group sing-along or choir ($n=5$) was the most common method of group singing intervention in music therapy for persons with dementia. In terms of

intervention strategies, the most common one was song reminiscence ($n=9$), followed by singing familiar songs ($n=8$).

4.2 Group Singing Only vs Group Singing as Part of the Intervention

This review showed that only 3 studies used group singing as the sole method of intervention (Lee et al., 2022; Tanaka et al., 2022; Thompson et al., 2023). In these studies, group singing served as the sole mechanism for change. Tanaka et al. (2022) argued that the specific scales and modes used in their choice of Japanese music allowed the persons with dementia to experience a recollection of their past memories. Both Lee et al. (2022), and Thompson et al. (2023) examined the effects of group singing together with the family members of persons with dementia. Lee et al. (2022) focused on bringing the person with dementia and their family carers together through a community group singing intervention. Thompson et al. (2023) aimed to better understand the psychosocial experience of persons with dementia when group singing interventions also involved their family members. One of the common aspects of these studies was that they involved individuals with early stage of dementia or Alzheimer's disease. In addition, all of them focused on the musical connections group singing brings based on family and cultural heritage. Furthermore, the effectiveness of this method is further affirmed through positive outcomes from both studies (Lee et al., 2022; Thompson et al., 2023). According to the aforementioned studies, group singing as the sole intervention served as a psychosocial vehicle for change in persons with dementia, hence, clinicians working with the psychosocial goal could take note and implement group singing in music therapy as the sole intervention when working with persons with dementia with added component of relational aspect with their family, heritage and culture.

Four studies used the music listening activity in addition to group singing interventions (Domíniguez-Chávez et al., 2019; Flo et al., 2022; Lyu et al., 2018; Tz-Han et al., 2023). In terms of the severity levels of dementia mild cognitive impairment (MCI) was the main diagnostic characteristics of the participants (Domíniguez-Chávez et al., 2019; Flo et al., 2022; Tz-Han et al., 2023). In these studies, music listening was a strategy to facilitate reminiscence while also serving as a way to discover musical preference and promote verbal interaction among participants. Hence, group singing activity along with music listening activity can be a viable and useful combinational approach for persons in the early stage of dementia (Domíniguez-Chávez et al., 2019; Flo et al., 2022; Tz-Han et al., 2023).

4.3 The Implication of “Reminiscence”

The intervention goal of reminiscence was present in nine studies (Baker et al., 2022; Cevasco & Grant, 2003; Dassa & Amir, 2014; Lee et al., 2022; Lyu et al., 2018; Tanaka et al., 2015; Takahashi & Matsushita, 2006; Thompson et al., 2023, Tz-Han et al., 2023). When considering the severity level of dementia of the participants, it can be concluded that reminiscence was implemented for participants in all stages of dementia. Table 7 shows the number of studies with the intervention goal of reminiscence according to the severity level of the disease.

Table 7

Studies Providing Reminiscence Intervention According to Severity Level

Severity of dementia	Count
Non-specified	3
Mild to moderate dementia/Early to middle stage AD	2
Moderate to severe dementia/Middle to late-stage AD	2
All severity	1
Questionable dementia	1

Further to this, 5 studies used familiar music to evoke reminiscence in persons with dementia (Baker et al., 2022; Lee et al., 2022, Lyu et al., 2022; Takahashi & Matsushita, 2006; Thompson et al., 2023). Baker et al. (2022) used reminiscence to support the psychosocial needs and to reduce depressive symptoms in persons with dementia. Reminiscence facilitated by familiar music was used to reduce neuropsychiatric symptoms in the studies by Baker et al. (2022), Lyu et al. (2018), and Tz-Han et al. (2023). Hence, it can be postulated that reminiscence facilitated through familiar songs can be used to with aim to address affective and neuropsychiatric symptoms.

4.4 Interventions According to the Progress of the Disease

In dementia, the progress of the disease can be categorized as mild, moderate, and severe. One of the measurements for level of diagnosis is the *Mini-Mental State Examination (MMSE)* as used by Flo et al. (2022), Lee et al. (2022), Lyu et al. (2018), Mabire et al. (2022), Hong & Choi (2011), Dassa & Amir (2014), and Groene et. Al., (2001). Other measurement tools utilized in the evaluated studies included the Clinical Dementia Rating scale or CDR or the Montreal Cognitive Assessment (MoCA) amongst others (Sheehan, 2012). In using MMSE, the result of the test can be interpreted as: score of 24 or higher = Normal cognition; no dementia, score of 19 to 23 = mild dementia, score of 10 to 18 = moderate dementia, and score of 9 or lower = severe dementia (*Mini-Mental State Exam (MMSE) Alzheimer's / Dementia Test: Administration, Accuracy and Scoring*, 2012).

This scoping review shows that most of the intervention strategies found in this scoping review was interchangeable with all progress of disease in dementia. However, some intervention strategies, including individual singing lessons,

utilization of flexible themes, warm up games, songwriting, the use of original music and unfamiliar/new song learnings were unique to a specific level of progress of the disease. A further analysis showed these characteristics, which is visualized in Figure 3.

Individual singing lesson was a specific intervention strategy found in Flo et al. (2022). This strategy was unique to mild to moderate level of dementia. A comprehensive review of the study found that the individual singing lesson exists to complement the biweekly choir intervention, which was a shared intervention between all disease progress levels of dementia (Flo et al., 2022). Singing session with flexibility according to the theme was a specific intervention strategy found in Lee et al. (2022). Themes of the session were based on the community's salient event (Lee et al., 2022). Warm up game, a social specific intervention strategy, and unfamiliar song singing, a cognitive specific intervention strategy was also part of the music therapy session provided in the same study by Lee et al., 2022.

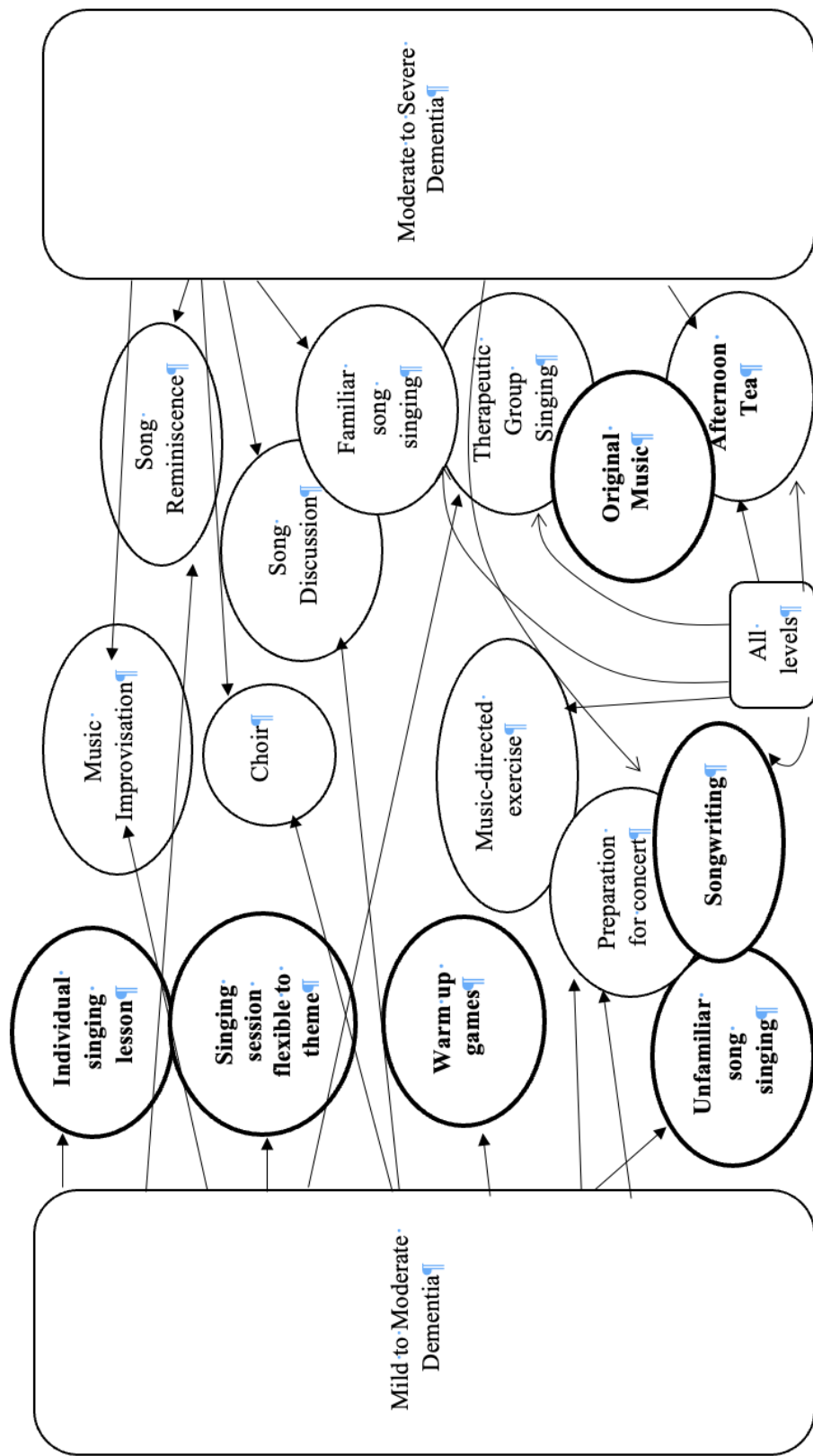
The use of original music was a specific intervention strategy that was used by Tanaka et al. (2015), and Hong & Choi (2006). Tanaka et al. (2015) aimed to use original music to examine whether the patient's reaction depends on his or her recollection of the familiar songs. This study accepted and divided persons with dementia into groups according to the severity of their dementia. Hence, this specific intervention strategy was unique to their study. Hong & Choi (2006) aimed to examine the therapeutic efficacy of songwriting-oriented music therapy in elderlies diagnosed with dementia. According to the study aforementioned, clinicians can take note that while some studies described and examined group singing interventions

which are specific to the studies, most of the group singing interventions are interchangeable regardless of the severity of the disease.



Figure 3

Intervention Strategies Utilized According to the Severity Levels



CHAPTER 5

CONCLUSION

5.1 Summary of findings

This scoping review analyzed the methods and strategies of implementing group singing intervention in music therapy for persons with dementia. The reviewer selected 17 studies that were most suited for the analysis including qualitative and quantitative studies and has found that the most common method of group singing intervention was choir singing facilitated by music therapist. The most frequently utilized intervention strategy was singing familiar songs. These songs were sung in group sing-along or choir. Based on the current reviews, the extensive clinical implications of group singing are evident, as it has been utilized across a wide range of clinical objectives in the 17 studies reviewed. Among these goals, group singing was most frequently employed to address cognitive and emotional objectives. Specifically, facilitating reminiscence and maintaining memory were the top cognitive goals, while increasing self-expression, reducing depressive symptoms, and improving mood were the primary emotional goals. Notably, specific strategies have been implemented to accommodate the functioning levels of individuals with varying stages of dementia, allowing for the utilization of group singing throughout all stages of the condition. The comprehensive findings of this review emphasize the multifaceted benefits of group singing for individuals with dementia and provide a valuable guideline for music therapists beginning their practice in dementia care.

5.2 Recommendations for Future Research

(McDermott et al., 2013)The scoping review encompassed the compilation and analysis of articles from diverse global locations. However, a notable observation is the absence of studies specifically dedicated to exploring the methods of group singing intervention for individuals with dementia in the Southeast Asia area including Thailand. There is a clear need for studies in this region to address the cultural-specific considerations involved in implementing group singing interventions. Such research would contribute to a better understanding of how to effectively utilize group singing as an intervention in this particular cultural context.

In order to enhance the transparency, replicability, and clinical application of group singing interventions, there is a need for studies to provide more comprehensive and detailed descriptions of their intervention content and process. This can be achieved by conducting more rigorous review studies in the future, which thoroughly examine and document the specific components and procedures of group singing interventions. Such an approach would facilitate better understanding, promote transparency in research, allow for effective replication, and ultimately contribute to the advancement of group singing intervention in music therapy.

5.3 Limitations

Although the author has conducted a comprehensive search of literature on three databases and hand search of seven music therapy related journals, there is a possibility that some relevant articles may have been overlooked due to limitations in search strings, database coverage, and library accessibility. Consequently, the group singing methods and strategies presented in this review may not be entirely comprehensive, as certain studies may have been excluded. Furthermore, due to the nature of this review being conducted as part of a

graduate study, collaboration with other researchers for the purposes of searching, extracting, and analyzing data was not feasible. As a result, there is a possibility of differing interpretations of the data under review. Lastly, some aspects of interventions may not have been thoroughly investigated due to a lack of detailed description of music therapy protocol or methods presented in some studies



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VITA

NAME Pongthipok Sootthipong

DATE OF BIRTH 23 July 1997

PLACE OF BIRTH Bangkok, Thailand

INSTITUTIONS ATTENDED Bachelor of Arts in Music with Second Class Honours (Upper Division) at Goldsmiths' College, University of London, United Kingdom - Course of Study Designed and Delivered by LASALLE College of the Arts, Singapore (2016-2019)

Masters of Arts in Music Therapy at Chulalongkorn University, Thailand (2021-Current)

HOME ADDRESS 34/26 Soi Barommaratchachonnani 123, Sala Thamasop, Thawi Watthana, Bangkok 10170, Thailand