Abstract of the thesis entitled

An evidence-based guideline of using music for elderly with dementia to reduce agitated behaviors

Submitted by

Kin Hei Anthony, Chan

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Agitated behaviours in dementia elderly predispose to negative outcomes. Music intervention is an evidence-based intervention that could help to ease the situation. The integrative and systematic review studies provide evidence that music intervention is effective in reducing agitated behaviours in dementia elderly. The assessment of the implementation potential, the feasibility and transferability demonstrate the music intervention can be implemented in local setting. An evidence-based guideline based on the reviewed papers is developed to use in local HK hospitals or nursing homes. With the help of an effective communication plan to the stakeholders, it is believed that the intervention can be smoothly implemented. Further evaluation helps to review the potentials for sustaining the intervention in the long run.
An evidence-based guideline of using music for elderly with dementia to reduce agitated behaviors

by

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BN, RN

A thesis submitted in partial fulfillment of the requirements for
the Degree of Master of Nursing
at the University of Hong Kong.

July 2013
To my parents, William and Cynthia, and my brother Andrew

whose love and support

have nurtured me throughout all my learning endeavour.
Declaration

I declare that this thesis represents my own work, except where due acknowledgement is made, and that it has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualifications.

________________________________

Kin Hei Anthony Chan

July 2013
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Chapter 1: Introduction

1.1 Background

Hong Kong (HK), like other well-developed countries, faces the problem of ageing population. With ever-advancing quality health care services, there is low mortality rate which gives rise to an increase of the elderly population in the community.

According to World Health Organization (2012), the world population is rapidly ageing. It is estimated that between 2000 and 2050, the proportion of the world's population aged 60 years old or above will double from about 11% to 22% and the absolute number of people aged 60 years and over is expected to surge from 605 million to 2 billion. It also suggested that there will be a dramatic increase in the number of people with dementia. The risk of dementia rises sharply with age with an estimated 25-30% of people aged 85 or older having declination of cognitive function (Chiu et al, 1998).

Similar situation occurs in the HK context, as what Census and Statistics Department (2010) pointed out in its population projections in the year 2010. It is estimated that between 2009 and 2029, the proportion of the HK population aged 65 years old or above will double from about 13% to 25%. The absolute number of people aged 65
years and over is expected to increase from 750 thousand to 1.5 million over the same period. HK mean life expectancy in 2009 for male are 79.8 and 86.1 years old respectively; and by projection, the figure in 2029 will become 82.8 and 89.2 years respectively. Due to low mortality rate, low birth rate, better health access service, the population pyramid occurs in a constrictive shape. Higher percentage of older people is retired and they require social support from the government. Further, aged people are more vulnerable to medical diseases and illnesses which require higher medical expenditure such as hypertension, diabetic mellitus and dementia. As a result, high medical expenditure is a foreseeable problem in HK in the near future. The society put emphasis on ways to encounter ageing population.

Among all medical illnesses, dementia is one of the most common ones for the elderly, which reduces the capacity of elderly to care for themselves. The number of the elderly diagnosed with dementia in HK is increasing. In 2006, more than 70,000 community dwelling older people suffered from dementia (Lam et al., 2007).

Prevalence of dementia increases with age. Lam et al. (2007) reported that 4% in older people aged 65 or above and 6% among those aged 70 or above were diagnosed dementia. The prevalence of the disease doubles every five years from the age of
65 (Chiu et al., 1998). Also pointing to the trend of increased number of cases with age, a local research conducted by Department of Health (DH) and the Chinese University of Hong Kong in 2006 revealed that the prevalence for the 60-65 age group and the 85 or above age group were 1.2% and 32% (1 out of 3) respectively. Assuming the prevalence rates of dementia in different age groups remain static throughout the years, the number of people diagnosed with dementia will increase due to ageing population and longer life span.

Dementia is a syndrome of intellectual deterioration characterized by memory problems, loss of communication skills and changes in personality severely enough to interfere with occupational or social performance (Porth, 2011). As the disease progresses, mental and cognitive functions become impaired. Symptoms such as delirium, agitation, aggressiveness or acute confusion may be aroused as well.

Among all symptoms in dementia, agitation has been identified by caregivers as the greatest challenge in patients with dementia (Ho et al., 2011). It is defined as inappropriate language or actions that arise from personal needs or confusion (Cohen-Mansfield & Billig, 1986). This behaviour put great stress on caregivers and the elderly themselves which leads to chains of negative consequences. The burden
may also increase medical cost. Hence, effective measure has to be considered.

From the literature review, music is found to be one of the more effective non-pharmacological interventions to reduce the agitated behaviours in dementia elderly. The therapeutic aims for use of music are to bring positive patient outcomes and to aid in physiological, psychological and emotional integration of a person during treatment of an illness or disability (Munro et al., 1978). Music can change the reactions of automatic nervous system in the thalamus, regulate the nervous impulse conductions of the limbic system and reticular activating system. This can lead to a decrease in adrenergic activity and release of adrenocorticotropic hormone and hence, tolerance to pain is increased (Beck, 1991). This dissertation aims to explore the effectiveness of the use of music to reduce agitated behaviour in dementia elderly.

1.2 Affirming the need

As aforementioned, dementia is a common mental illness closely related to ageing and it influences cognition. As a result, it could also create temper and low mood. Caregivers are also affected that create disharmony between family members. The disease outcome is directly related to increased direct cost such as the cost of hospitalization and medication. Indirect cost includes disability related to fall,
premature morbidity related to medication, and physiological and psychosocial caregiver burden. All of the above factors result poor health outcomes.

Among the symptoms identified, agitated behaviours have been identified as the most challenging care problems (Forbes et al., 2005). It is also the most troubling problem and primary source of pressure for the families and nursing staffs (Smith, 2004; Gwendolen and Heidi, 2007). There are interventions available to manage dementia including the use of antipsychotic drugs or physical restraints. However, the use of antipsychotic drugs may result in serious adverse effects including headache, drowsiness or even death. Some of the antidepressants may even increase the chance of agitation. The use of physical restraints may increase the incidence of injuries and falls, and is considered as an indicator of poor quality of care institutional settings (Capezuti et.al., 1998). The improper use of physical restraints may also worsen agitation.

Managing agitated behaviours in dementia elderly remains a difficult task. The elderly with dementia are often associated with other chronic illnesses. They are prone to hospitalization than the other young age groups. Hospital Authority Statistical report (2009-2010) revealed that around 50% of the hospitalized clients were aged 65 or
above. Frontline nurses are taking care of the elderly most of the time and sometimes with those diagnosed with dementia. However, nurses in hospitals or nursing homes focus more on accomplishing daily routines and tasks rather than dealing with psychological problem such as agitation. A lack of attention on psychological wellbeing is observed. In HK public hospitals, nurse to client ratio is around 1:12 during day time and 1:20 during night time in general ward. Most of the time clients are left unoccupied and nurses seldom have time to deeply interact with their clients.

Agitation attributes to unmet needs related to boredom and confusion (Burgio et al, 1994; Ice, 2002). Agitated behaviours in dementia elderly creates disharmony between nurse to elderly and disruption of nursing care. Frontline nurses know little about signs and symptoms of dementia as well as agitation. They perceive agitated behaviours in dementia simply as confusion. Due to busy routines and limited resources, it is hard for nurses to perform comprehensive assessment on each individual. They tend to use physical restraints as the first line intervention for agitation in order to prevent injuries and falls. Without proper identification of agitation, it increases nurses’ stress and workload. High demand of workload together with the stress attributed by agitation causes nurses to burn out and get frustrated. The problem of nurses’ insufficient knowledge on the issue is magnified with the lack of
guidelines or protocols in dealing with the elderly with dementia. Quality of care, therefore, cannot be maintained. The cycle continues which makes the situation getting worse.

Agitated dementia elderly may cause undesirable outcomes including decreased oral intake which leads to weight loss and dehydration. Falls or injuries may as well be a potential risk. It results in reducing the activity of daily living. Both physical restraint and risk of fall are the key nursing quality indicators. Even though it is advised not to use physical restraint often, fall rates should be maintained at a low level; this has presented a difficult dilemma.

All the above concerns lead to research seeking alterative intervention to manage agitated behaviours in dementia. Despite the pharmacological method or physical restraints, the literature suggests using non-pharmacological as an alternative intervention. One of the most common and effective interventions is the use of music to manage agitated dementia elderly.

A number of reports and studies reported the use of music for the dementia elderly to increase and to maintain their level of physical, mental and social or emotional
functioning. Physically, music helps to assist in physical rehabilitation and improve quality of life and wellness. It can be used as an environmental modifier to mask unpleasant noises (Broton et al., 1997). The reason of such an effect is closely linked to the attention of the patient. Mentally, music helps to enhance memory and reduce stress. Music can decrease the level of adrenocorticotropic hormone which increases pain tolerance (Becck, 1991). Emotionally, music helps to express feelings and alleviate the level of agitation. As what Sung et al. (2012) maintained, music helps to change the focus of attention. Thus, it is clear that music also has a psychological effect on the patient. Gerdner (2000) even claimed that music helps to elicit positive memories from an earlier period and have a soothing effect.

On top of all these benefits, music as an intervention is also practically advantageous. The intervention itself can be merely controlled and implemented by nurses without cooperation with other disciplines. Most importantly, the use of music is a simple, low cost, cost effective intervention and probably harmless. To conclude, the use of music is meritorious to provide a better health outcome for elderly with dementia in various ways.

1.3 Objectives and research question of dissertation
The objective of this research is to conduct a systematic search of the literature on the effect of music in reducing agitated behaviours in elderly with dementia, to extract the representable papers and perform quality assessment and to summarize and synthesize the findings.

A searchable and answerable question in relation to the identified issue is formulated as “Can the use of music reduce the agitated behaviours in elderly with dementia?”.

1.4 Significance of the dissertation
This research reviews the use of music as an alternative method to manage agitation in dementia elderly. Currently, pharmacological method and physical restraints are the main method of intervention in HK, although they cause negative health outcomes to the dementia elderly. In contrast, music is so much less recognised and thus, no protocols or guidelines have been developed on how to use music to relieve agitation. Nurses are stressed and struggled to find a better way to manage agitation.

Furthermore, nursing intervention puts too much emphasis on non-pharmacological method, and it is necessary to explore alternative method to manage agitation in nursing aspect. With the strong evidence on the use of music in agitation nowadays, it
is important to explore whether the use of music can be one useful intervention in nursing practice.
CHAPTER 2: Critical appraisal

2.1 Search Strategies

2.1.1 Identification of studies

Relevant studies were first identified through four medically related electronic database including Medline (Ovid), PubMed, CINAHL (EBSCOhost) and Cochrane library. Databases were accessed through electronic database via The University of HK Libraries.

Keyword search could be differentiated into three categories including intervention, outcome and target population. Keywords used were rather simple and easy to identify. Keywords related to intervention included “music” or “music therapy”. Another category of keyword for outcome included “agitat*”, that compromised of agitated behaviours, agitation or agitate. The last category of keyword was the target population which included “dementia”. Given that Alzheimer’s disease is a sub-type of dementia, the keyword “Alzheimer’s disease” was used to compare any differences of the search result with “dementia”. Preliminary search was performed and it showed that the result of using dementia as keyword is the same as using Alzheimer disease. Hence, “dementia” is used as the keyword for the target population.
Another source of literature came from the screening of the reference list of those selected studies manually. As the selected studies have high level of evidence, those citations may be useful as well. Searching through “yahoo” and “google” was also performed. However, the studies listed either did not match the inclusion and exclusion criteria or they were not relevant.

2.1.2 Inclusion and exclusion criteria

Inclusion criteria specified that the target had to be aged over 65, with confirmed diagnosis of dementia. Year of publication was restricted from year 2002 to year 2012. Experimental studies were all included. Full text should be available in order to assess the quality of the study. Institutionalized elderly is preferred as the environment and settings are similar with the clinical setting.

Exclusion criteria was set to exclude unpublished studies and articles not written in English. After reviewing the content of the study, it was found that the control group has been treated with other interventions rather than usual care. It was difficult to compare the efficacy of the music intervention with other intervention. Hence, an additional exclusion criterion was set that the control group should only be treated with usual care rather than with other interventions.
2.1.3 Data Extraction

The search was performed during August 2012. Title and abstracts of the resulting citations were first screened. If the paper matched with the inclusion and exclusion criteria, full papers and reference list of the studies were reviewed. Search result is listed in Appendix 1.

After reviewing all the papers, five randomized controlled trial papers were selected as the best evidence. They are:


Disorders. 22(2), 158-162.


Data was extracted in order to generalize a table of evidence provided by the Scottish Intercollegiate Guidelines Network (Scottish Intercollegiate Guidelines Network, 2012). Data extracted included bibliographic citations, type of the study, level of evidence, patient characteristics, sample size, interventions and comparisons, lengths of follow up, outcome measures and effect size. The table of evidence was developed and attached in Appendix 2.

2.1.4 Appraisal strategies

Scottish Intercollegiate Guidelines Network (SIGN) provides a critical appraisal checklist especially designed to assess the quality of the papers. As all of the selected
papers are randomized controlled trial, checklist specifically designed for randomized controlled trial was used. Details of the critical appraisal checklist for the five studies were summarized in Appendix 3.

2.2 Summary of the data

2.2.1 Search history and research design

A total of one hundred and thirty seven studies were retrieved by the search strategies by using keywords. The total number of studies retrieved was quite small as the outcome was set specifically for agitated behaviours. Titles and abstracts were first screened as relevant to the use of music to reduce agitated behaviours in dementia elderly. Full texts of the relevant studies were then reviewed. Five randomized controlled trials studies met the inclusion and exclusion criteria from four databases. Some of the studies showed statically insignificant results for the intervention such as Cooke et al. (2010).

2.2.2 Evidence level

Five of the studies achieved the evidence level ranging from 1+ to 1++. “1” refers to randomized controlled trial and + or ++ means that some to most of the criteria have been fulfilled according to the SIGN critical appraisal checklist. Those criteria that
have not been fulfilled or not adequately addressed were thought to be unlikely to alter the conclusions (Scottish Intercollegiate Guidelines Network, 2012). SIGN critical appraisal checklist for the five studies was summarized as table format in Appendix 3.

Studies were evaluated according to a number of criteria including “appropriateness and clarity of the focused question”, “randomization method”, “concealment method”, “blinding”, “similarity at the start of the trial”, “difference between groups is the treatment under investigation”, “standard measurement”, “dropout rate”, “intention to treat” and “carried and compare at different sites”.

All five of the studies appropriately and clearly addressed the focused question. Randomization method was clearly illustrated and ethically approved. However, only two of the studies described the concealment method. The issue of blinding was clearly addressed in most of the studies. However, the difficulty of blinding was noted as the study participants were staying at the same institution. They might communicate and exchange ideas in between the intervention period. Characteristics of treatment and control group were similar at the start of the trial as all studies provided the demographic data and characteristics of both groups. Statistical testing
was used to determine the p-value, which showed that there was no relationship between the intervention and control group. Homogeneity of the groups was also tested.

All five of the studies adequately argued that the only difference between groups was the treatment under investigation. All subjects in the same group were equally treated. Outcome was measured in a standard, valid and reliable way as the primary outcome of the five selected studies was on agitated behaviours. Subjective tools including Neuropsychiatry Inventory (NPI) and Cohen-Mansfield Agitation Inventory (CMAI) were used to examine the frequency of agitated behaviours. Dropout rate was well covered in all five studies and the drop-out rate was low. Reasons were clearly provided for each dropout case. Four studies did not or poorly addressed the “intention to treat” issue, however, Sung et al. (2006) had no drop out cases, so the “intention to treat” was not applicable in those cases. “Comparison of results at different sites” item was not shown in the studies and they were calculated as a whole even though the data was collected in more than one site. With those studies which were carried out in one site only, this item is not applicable.

2.2.3 Patient characteristics
The number of participants in the five studies ranged from thirty six to one hundred. They were aged 65 or above and consisted of female and male. Studies were carried out in Taiwan and Italy. All subjects had a confirmed diagnosis with dementia by Diagnostic and Statistical Manual IV criteria established by American Psychiatric Association in 1994. All studies provided baseline clinical characteristics of both intervention and control group for comparison. Mini-mental State Examination showed that the degree of dementia ranged from the moderate to severe type.

2.2.4 Intervention

Three studies used group music and the other two studies used individual music as the intervention. Duration of each intervention session in all five studies was 30 minutes. Four studies used the entire 30 minutes for music intervention. Only Sung et al. (2012) broke down the 30-minute intervention with a 5-minute warm-up session, 20-minute percussion music and 5-minute cool down session. Four studies had eight to twelve sessions and Raglio et al. (2008) had thirty sessions. Duration of the whole intervention ranged from four to six weeks. Choice of music varied from instrumental music, percussion music to familiar music with pleasant moderate rhythm and tempo.

2.2.5 Control
All the five studies treated control group in usual care according to institution routine practice.

2.2.6 Outcome measures

Subjective tools including Neuropsychiatry Inventory (NPI) and Cohen-Mansfield Agitation Inventory (CMAI) are used to examine the frequency of agitated behaviours. CMAI rates a subject’s agitated behaviours and its frequency over the previous 2 weeks. CMAI includes 29 items, each consisted of a 7-point scale rating (1-7) ranging from never (1 point) to several times an hour (7 points). Hence, the minimum total score is 29 and the maximum was 203. There are four categories of behaviour among the 29 items, including physically non-aggressive, physically non-aggressive, physically aggressive, verbally non-aggressive and verbally aggressive. According to Lin et al. (2011), validity and reliability of CMAI was tested with good outcome.

2.2.7 Length of follow up

Four studies have the length of follow up of around 10-12 weeks. Four studies performed their last follow up 4 weeks after the last intervention and only one performed right after the end of the last intervention.
2.2.8 Effect size

Four studies showed statistically significant results in reducing agitated behaviours.

Data were collected at different times during the intervention. Lin et al. (2011) used Chinese CMAI tool to assess and the effect size ranged from 0.11-0.47 with statistical significance. Sung et al. (2006) used modified CMAI and the effect size ranged from 3.65-3.85. Raglio et al. (2010) used NPI score. The effect size was 1.56-1.77 for the NPI items regarding agitation. Raglio et al. (2008) reported effect size of using NPI global score 9.85-21.21. Sung et al. (2012) showed statistically insignificant effect size of 0.003(p=0.95). It may be due to the low occurrence of agitated behaviours in both groups at baseline. Another reason is that improvement of the group music intervention on agitated behaviours was limited. However, the intervention showed significant results in reducing anxiety level.

2.3 Summary of synthesis

Critical appraisal was performed for the five most relevant studies providing high level of evidence to describe the effectiveness of using music as the intervention for agitated dementia elderly. Three main categories were identified to synthesize the summarized findings which are time, place and people.
2.3.1 Time

Duration of the each intervention session is crucial. All of the five studies suggested that 30 minutes was a good length to make it work. Although the most effective duration remains unknown, it is highly recommended that this duration is appropriate as the results of the studies have shown. Furthermore, it is better to use the whole 30 minutes for music intervention rather than the type of intervention suggested by Sung et al. (2012) - that there were only 20 minutes of music intervention and the other 10 minutes were used for warm up and cool down sessions. Given that Sung et al. (2012) is the only study that showed no statistical significant result in reducing agitation, the content of the intervention may account for the differences.

With regard to the number of sessions, it is preferable to have eight to twelve. Frequency of the study is recommended to be twice per week to maintain the therapeutic level. The whole intervention could be conducted lasting four to six weeks in total. Studies showed that the therapeutic effect could sustain at least 4 weeks after the end of the intervention.

2.3.2 Place and intervention

All the five studies conducted the intervention inside the institution area. Group music
and individual music both showed effective outcome. It is preferable to choose music that the patients like and are familiar with, and those which have moderate rhythm and tempo as patients react most strongly and positively to this kind of music. Music that has a stronger beat is preferable and music with sharp peaks and valleys should be avoided. Sung et al. (2006) recommended allowing the patients to move when playing the music so that they become more involved. Three studies conducted in Taiwan have high transferability into HK setting. Also, cultural validity was tested as the other two studies were carried out in Italy.

2.3.3 People

Regarding participants, it is recommended to be dementia elderly who are confirmed with no hearing impairment or loss. Music needs to be loud enough for the elderly to hear but not too loud to make them uncomfortable. Moderate and severe dementia patients are also eligible to join the intervention.

With respect to the intervention provider, nurses are capable to conduct the intervention as it is easy to learn and implement. Ethical nurses emphasize “Do no harm” to clients. None of the studies reported any harmful, life threatening side effects of using music. However, it is preferable to have music therapy training which
provides basic understanding and idea of the intervention in order to conduct it smoothly.

After reviewing the five studies, it is confident to conclude that the use of music to reduce agitation for dementia elderly is an effective intervention. Thirty minutes of individual or group music intervention administered twice per week, for an overall duration of four to six weeks, can maintain the ideal outcome lasting for four weeks after the intervention. Further illustration to justify the feasibility of the intervention will be done at a later part.
Chapter 3 Translation and application

3.1 Implementation potential

Chapter 2 critically appraised how the use of music could reduce the agitated behaviours in the elderly with dementia. This new intervention can be applied in public rehabilitation hospitals, nursing homes or day care center in HK. In HK, all public hospitals are governed under Hospital Authority (HA), which encourages intervention and changes aiming at providing better health care and achieving health outcome. Before discussing the best evidence discussed in Chapter 2, it is important to assess the implementation potentials in local settings. Several issues regarding implementation potentials which need to be considered includes transferability of the findings, feasibility and its cost/benefit ratio (Polit & Beck, 2012).

3.1.1 Transferability of the findings

Transferability refers to whether the intervention makes sense to implement in the practice setting (Polit & Beck, 2012). This music intervention is proposed to be implemented in rehabilitation dementia unit in public HK hospitals, nursing homes and day care center. The below paragraphs illustrate the criteria that demonstrate the transferability of the intervention.
First, the reviewed studies were all performed in institutionalized setting such as hospitals and nursing homes, similar to the proposed setting in HK. Some of the government subsidized nursing homes and day care centers are specifically for dementia elderly. Those elderly stay in the identified settings for a longer period. Follow up and progress can be easily monitored. Lin et al. (2011), Raglo et al. (2010) and Sung et al. (2006) suggested that group music is more preferable than individualized music. In HK hospitals and nursing homes, common area is available in each unit. The elderly usually have meals and daily activities in the common area and it is feasible to perform group music intervention in such an area. Hence, a place for performing music intervention is available.

Lin et al. (2011), Sung et al. (2006) and Sung et al. (2012) implemented music intervention in Taiwan. As HK and Taiwan are both influenced by Chinese culture, the results from the studies are highly transferable to the HK situation. HK is experiencing aging population and due to advanced medical development, number of moderate to severe degree of dementia elderly is increasing rapidly. Characteristics of dementia elderly are similar to the sample characteristics from the above studies.

The development of health care service in the identified five studies was rather similar.
All the reviewed studies were performed in developed countries and therefore, nursing care standard and development should be comparable to the case of Hong Kong. Before 1997, Hong Kong was governed by Britain which instilled bits of Western culture into Hong Kong. In 1997, Hong Kong was returned to China and since then, the development of nursing is highly influenced by both the Western and Chinese culture. This unique historical background makes HK more capable of adapting cultural variations.

Music is a worldwide instrument or ‘language’ that touches people’s heart. The intervention aimed to use music to provide better health care and outcome to the target population. The philosophy of care of using music in the studies is fundamentally similar in HK. Music is commonly used as an intervention such as with cancer patients in managing chronic pain and preoperative anxiety. Music itself is widely acceptable in HK. Hence, the prevailing philosophy of care can be entrenched.

The intervention is suggested to implement in rehabilitation dementia unit in HK hospitals, nursing homes or day care centers. All patients in the identified settings are elderly diagnosed with dementia and it is possible for a large number of clients in the identified settings who could benefit from the interventions. There is around forty to
sixty elderly in a dementia rehabilitation ward. It is estimated that around 90% of the elderly are eligible for the music intervention expect those who have hearing impairment.

The intervention is suggested to last for four to six weeks depending on the target availability. The exact length of stay for each dementia client was not available from the studies. Through observation in the rehabilitation ward, dementia elderly usually stayed for four to six weeks depending on their individual rehabilitation progress. Those dementia elderly in old aged homes and day care centers would stay longer than six weeks.

Preparation work is rather simple. A briefing session is necessary for the caregivers. It is preferable to have pilot intervention for a small group (around 20-30 elderly) to provide a preliminary idea and evaluation of the intervention with the staff. Further changes may be necessary after evaluation in order to fit in local settings which aim to provide an effective intervention to the target population.

3.1.2 Feasibility

Feasibility concerns the availability of staff and resources, the organization climate,
the need for and availability of external assistance and the potential for clinical evaluation (Polit & Beck, 2012). Every year, the HA holds a nursing intervention symposium that encourages nurses to propose innovations to enhance current practices. In my hospital, every nurse can initiate pilot innovative interventions with approval by Department Operation Manager (DOM). After the pilot intervention, study findings and implications are published via posters and oral presentations. Ease of carrying out and terminating innovative measures is considered to be desirable.

The proposed music intervention is easy to be administered with only little interruption to current staff function. Routinely, the elderly gather at the common room during mealtime including breakfast, lunch and dinner. All staff are involved in assisting clients in mobilization. After mealtime, the elderly usually take a rest for around 30 minutes before getting back to their beds with assistance.

The music intervention can take part during their resting period in the common room. Clinical nurses can perform the music intervention by playing the CD player with an identified type of music in previous session.

Administratively, the organization particularly supports evidence-based intervention.
HA stresses on continuously improvement of service quality and demand. Managerial nurses are keen to explore new interventions that help to improve clients’ rehabilitation potentials and improve health outcomes. In modern nursing, more emphasis is put on evidence based practice.

To implement the intervention successfully, the major concern lies on staff acceptance of the group music intervention. Junior staffs tend to be more acceptable of new changes or challenges. Senior staffs need more time to adapt to the changes and in order to gain their support, detailed illustration of the benefits of the intervention is needed. Pilot trial of the intervention can further strengthen staff’s understanding of the procedure. Evaluation after the pilot trial will be necessary for further fine-tuning of the intervention.

Modern hospital care put emphasis on multidisciplinary approach. Every discipline is involved in client rehabilitation that aims to provide appropriate and effective care to facilitate clients’ recovery. Mutual respect among different disciplines is well developed and maintained in HK. The music intervention can merely be conducted and delivered by nurses, it is easy to implement the intervention with little friction or
disruptions caused by other parties.

Skills required for music intervention is rather straight forward and easy to learn.

Probably most of the nurses can grasp the key points of the group music intervention by pre-implementation workshop and during pilot study. Evidence-based guideline can be made to remind interventionists on the key points of the intervention. In the rehabilitation department, CD players and spacious common area are available on site. Only CDs or MP3 with preferred music is needed to be prepared.

Before the pilot study, nurses involved in delivering the intervention have to take part in pre-implementation workshop training. Time needed for training or released from work is minimal. Appendix 7 shows the hours needed for the whole intervention. Nurses’ daily routines will not be intervened much.

Tools for clinical evaluation are important to show how effective the intervention works in the HK population. Tools, such as Mini-mental State Examination (MMSE) are already available in my clinical settings. However, some of the tools are not available. It is necessary to get consensus from the tools publishers for the approval on using their tools to serve the public. Tools including Chinese version of Cohen-Mansfield Agitation Inventory (C-CMAI) and Neuropsychiatry Inventory (NSI)
are necessary for clinical evaluation.

3.1.3 Cost-benefit ratio of the intervention

Costs and benefits ratio refers to a careful assessment of the costs and benefits to various groups including clients, staff, and the overall organization (Polit & Beck, 2012). Dementia elderly is the main focus among all factors. It is important to minimize the potential risks and maximize the benefits in order to gain trust and support from other staff.

One of the potential risks of music intervention is the giving rise of more agitation in the elderly. Some elderly may be reluctant to music resulting in more agitation which in turn disturbs the others who are participating in the music intervention. However, none of the studies showed that this could be a potential problem as music delivered was rather smooth and easy to listen. Besides, most of the elderly in HK are used to listening to radio. Substituting radio by music presents a relatively easy transition for dementia elderly. It is suggested, though to be cautious of target’s reaction to the intervention in the first few sessions to look for any risks resulted from the intervention. Verbal consent is needed to ensure elderly willingness of the elderly to take part. Volume of the music also needs to be carefully measured to ensure that the
elderly can hear it.

Other minor risks include the lack of manpower to monitor the effectiveness of the intervention and attentiveness of the elderly. However, these minor risks can be solved by interventionists using their own time for evaluation and monitor the target’s reaction thoroughly during the intervention. In addition, getting approval from the ward manager to allow extra manpower at the beginning of the intervention could enhance the effectiveness of the intervention. Estimated man-hours requirement is calculated in Appendix 8. Furthermore, the unit can invite University research nurse to guide the data collection and synthesis process.

The main focus for music intervention is to decrease agitated behaviours in dementia elderly. As illustrated in introduction, agitated behaviours creates disharmony between the caregiver and dementia elderly and leads to serious negative consequences. It is commonly seen clinically that the caregiver becomes impatient and frustrated. If agitated behaviours can be reduced, a harmonic environment can be achieved. Stress level of both the caregivers and dementia elderly can be reduced. Their emotions can be smoothed.

At the moment, there is still no absolute intervention which shows effectiveness in
reducing agitated behaviours of dementia elderly. Pharmacological intervention is a way of controlling the progress of dementia but not specifically targeted to reducing agitated behaviours. Pharmacological intervention may cause series of side effects which in turn do harm or worsen the illness. Risk of having music intervention is minimal. Outcome of music intervention is significant from the data synthesized. It is expected to see discrepancy of the results obtained from the reviewed papers but the variation should be minimal.

Amount of material costs for music intervention is considered to be small. Music intervention takes place in common area which is already available in the facilities. Equipment needed includes a CD player or MP3 player which costs around HKD $1000, several CDs with identified type of music cost around HKD $500. Total material costs would be around HKD$1500. In the long run, maintenance would be required in terms of buying new CDs to provide wider choice of music. Estimated cost will be around HKD$300 per annum.

If the intervention is not implemented, there will be potential costs which include negative consequences resulted from agitated behaviours such as falls and incidents. Nurses need to focus more on their agitation and nursing care may be disturbed.
Potential nonmaterial costs could be intangible such as lowered staff morale and increased stress level of both the caregiver and dementia elderly. Lower staff morale may lead to high turnover rate. Resulting consequences can seriously affect the quality of care.

Potential nonmaterial benefits of implementing the intervention include improving staff morale as lesser agitated behaviours can be achieved. Lesser attention or stress for caregiver will be noticed including nursing staff and patients’ relatives. Music intervention indirectly provides a soothing effect for nursing staff as they are happy to see improvement from the elderly.

In conclusion, by assessing the transferability, feasibility and cost/benefit ratio of the intervention, the intervention can be transferred into the identified HK setting. Music intervention has the potential to act as a routine institutional activity. It helps to improve the quality of care to dementia elderly and staff morale in the long run.

3.2 Evidence-based guideline

After evaluating the implementation potential of the music intervention under scrutiny, the next stage is to develop an evidence-based guideline that is originated from the
systematic review for clinical nurses to follow.

The guideline is established based on Scottish Intercollegiate Guidelines Network (SIGN); A guideline developer’s handbook. This guideline aims to provide instructions for music intervention by grading evidence from the five identified studies in Chapter 2. Raglio et al.(2008), Sung et al.(2006) and Sung et al. (2012) are rated as 1++. The remaining two including Lin et al. (2011) and Raglio et al. (2008) are rated as 1+. The purpose of grading is to differentiate the strength of the evidence. The stronger the evidence, the higher the grading is.

3.2.1 Details of the guideline
The guideline is developed in a clear, conscious and user friendly way.

Title
An evidence-based guideline for the use of group music to reduce agitated behaviours in elderly with dementia

Objectives
1. To summarize the clinical evidence for the use of music to reduce agitated behaviours in elderly with dementia
2. To formulate clinical instructions for clinical nurses to use music intervention based on the best evidence available
3. To standardize the use of music for dementia elderly

Instructions
Patient selection
1. Subjects are preferably aged 65 or above and diagnosed with dementia by physician using objective tools such as Diagnostic and Statistical Manual of Mental Disorder (DSM-IV)
Grade of recommendation:
Available evidence: A

- Subjects were diagnosed by a physician as having dementia using DSM-IV and were aged above 65 to ensure diagnosed objectively; commonly aged over 65 suffer from dementia (Lin et al., 2011; Sung et al., 2006)
- Subjects were diagnosed of dementia according to DSM-IV criteria to ensure comparison on similar degree of severity in dementia (Raglio et al., 2008; Raglio et al., 2010)

2. Subjects are classified as moderate to severe type of dementia (i.e. scores on Mini-Mental State Examination (MMSE) lower than 18/30 or Global Deterioration Scale score 3-6)
Grade of recommendation: A
Available evidence:
- Subjects had MMSE score lower than or equal to 18/30 (Raglio et al., 2010)
- Subjects belonged to the moderate to severe type of dementia whose GDS score was 3-6 (Sung et al., 2006)
- Subjects’ MMSE score lower than or equal to 22/30 (Raglio et al., 2008)

Intervention
3. Group music is preferred to provide significant contributions to subjects with dementia
Grade of recommendation: A
Available evidence:
- High attendance at the group music therapy session (Lin et al., 2011)
- Group of three patients in each music intervention (Raglio et al., 2010)
- Group music intervention provides a channel for communication and interaction between dementia elderly and caregivers (Sung et al., 2012)

4. Each group music session lasts for 30 minutes
Grade of recommendation: A
Available evidence:
- 30 minutes for each music intervention due to limited attention span of people with dementia (Lin et al., 2011; Raglio et al., 2010; Sung et al., 2006; Raglio et al., 2008; Sung et al., 2012)
5. Each cycle of music intervention lasts twice per week for 6 weeks. 
   Grade of recommendation: B 
   Available evidence: 
   • 12 group music interventions (twice per week) were conducted (Lin et al., 2011, Sung et al., 2012) 
   • It was preferable to have a continuous duration of intervention to sustain the effect of the music intervention (Raglio et al., 2010) 
   • Music intervention twice a week for 4 weeks (Sung et al., 2006)

6. Music intervention takes place in facilities that subjects are familiar with such as common area of the facilities which provides warm and comfortable environment to attain a state of calmness and relaxation which further alleviate agitated behaviours. 
   Grade of recommendation: A 
   Available evidence: 
   • Interventions were conducted in a warm and comfortable environment (Lin et al., 2011) 
   • Music intervention contributed to raise clients’ threshold in tolerating environmental stimuli (Raglio et al., 2008) 
   • Dementia elderly were sensitive to the demands of the environment. When environmental demands were too strong for the level of competence, maladaptive behaviour could be occurred. (Sung et al., 2012)

7. Type of music can be varied but preferably have slow to moderate tempo and pitch. 
   Grade of recommendation: A 
   Available evidence: 
   • Rhythmical music with slow tempos could be relaxing. Pitch act on autonomic nervous system with low pitch promoting relaxation. (Lin et al., 2011) 
   • Music CD consisted of familiar melodies based on the preference of the majority of the elderly could improve the effects on their behavioural change. Moderate rhythm and tempo of the music allowed targets to move their body with limited range of motion (Sung et al., 2006; Sung et al., 2012)

8. Type of music is preferable to be familiar for the target population. 
   Grade of recommendation: A 
   Available evidence:
Familiar music could evoke more positive responses than unfamiliar music. Participants had more purposeful responses during the intervention. It could prompt their motor activity and memory recall (Sung et al., 2006)

Using familiar music to maximize familiarity in an existing environment could be a viable strategy to stimulate memories associated with positive feelings in those with dementia (Sung et al., 2012)
Chapter 4: Implementation plan

Introduction

Previous sections have illustrated that agitated behaviours is a major problem in dementia elderly. The use of music is critically appraised to justify its effectiveness in reducing agitated behaviours in dementia elderly. In this section, implementation potential is discussed to ensure the feasibility and transferability of the intervention to local setting. After all the stringent assessment, it is important to gather the evidence and put them into practice.

4.1 Communication plan

Communication plan is a marketing strategy that identifies the objectives and goals to the stakeholders, provides a timetable and makes an evaluation for review. A well-constructed communication plan is important to make the change successful. It involves two key components- the “who” and the “how”.

4.1.1 Involvement of stakeholders

Stakeholders refer to the “who” in one of the key components of a communication. They are the people who are influenced or involved in the proposed new intervention. The managerial staffs including Department Operation Manager (DOM), Ward
Managers (WM) and Nurse Consultant (NC) take role as stakeholders by making decision. Whether the intervention can be implemented depends on their approval. Letter to the department head will be formally presented. Another important group of stakeholders is nurses who execute the intervention. They act as “users” under the proposed EBP guideline to ensure the quality of the intervention. Nurses who join the working group are involved as they are familiar with the details of the intervention. Nurses who support or oppose the intervention are also stakeholders. They take vital roles in giving valuable suggestions and comments in order to improve the quality of the intervention and smoothen the launching of the intervention.

As this intervention does not involve other supporting units or medical professionals, it is not necessary to involve them as stakeholders. However, it is important to notify them via internal email the details of the intervention and to sincerely invite them to make enquires. The dementia elderly (participants) do not need to take part as the intervention is well tested and supported with evidence. They are the service users instead of administrators.

4.1.2 Communication process and implementation strategies

This section illustrates the process of communication plan and strategies to implement
the innovation smoothly and successfully.

At the beginning of the project, it is important to gain support and approval from managerial nurses including DOM, WM and NC. As they are the managerial nurses in the department, they are experienced and understand the clinical situation thoroughly. They have the authorization power and judgemental mind to give valuable suggestions with respect to the innovation. Detailed proposal including evidence, significance of the problem, intervention details and manpower will be clearly written and presented.

The next step is to gain support from nurses who will be involved in the latter stage of implementation. Their opinion and concerns weight heavily. Their support is crucial in making the innovation successful. A working group comprised of five nurses will be formed. They take an active role in the innovation. They discuss and evaluate the workflow and amend it whenever necessary. These nurses will serve as facilitators, trainers and data collectors for the innovation and they have full understanding on the innovation.

There are several determining implementation strategies that need to be carefully
applied. In marketing mix model, “5P” including price, place, promotion, package and product are controllable variables. These act as a framework in developing strategies for the innovation.

One of the strategies is to provide clear vision of why such a change is necessary. The variables “Product” defines the characteristics of the change made to intended customers. The designer of the intervention has to state clearly the severity of the clinical problems and provide decisive actions and solutions to overcome the problems effectively. Recent nursing practice focuses on evidence-based. It is necessary to provide evidence from the literature to ensure staff understanding on the current discrepancy between usual practice and evidence.

Another variable is “Package”. How much support and resistance to the proposed change is a crucial matter. Before implementation, it is necessary to ensure enough time and room for nurses to understand the innovation. Posters, announcement, introductive sharing and individual informal chat can provide better outcome. Nurses’ understanding and acceptance can facilitate the changes in a smooth way.

To guide the change systematically, it is needed to provide clear vision with deadlines.
A tentative timetable is proposed on a Gantt chart for clear understanding of the timeline of the innovation (Appendix 8). A pre-implementation training will be required for all clinical nurses to practice the intervention. In the session, details of the innovation will be illustrated through questions and answers to allow room for enquiries and clarifications. Working group members act as facilitators during the implementation stage. They assist in trouble shooting and maintain quality of the innovation. It is advisable that every music session is required a working group member stationed to ensure the intervention is smoothly launched. In addition, an evidence-based music intervention guideline is provided for staff members to gain a deeper understanding of the innovation. Timely review and update of the manual are necessary to keep the innovation up-to-date and effective.

A well planned “Promotion” can make the change process sustainable. Change process which is user-friendly and simple to manipulate can facilitate a smooth transition. Whether the change process is successful or not depends heavily at the beginning of the implementation. In the early stage, the EBP protocols, the pre-implementation training sessions and staff support account for the change process. Materials will be available in nurses’ station for reference. It is important to open more channels for staff to raise questions by using intranet or email. It helps with
early identification and early resolution of problems. More staff support results in better staff compliance with the new guideline.

In later stage, timely audit and evaluation helps to ensure the intervention is delivered with quality. Both staff satisfaction and client outcome are key indicators to show that changes are beneficial. Sharing session among staff after a period of implementation can review the problems encountered and discuss solutions for a better outcome. Periodical review and revisions of the intervention outcomes are necessary. All the above actions help to sustain the change process in the long run.

4.2 Pilot testing plan

Before the new changes start, launching a pilot study helps to reveal the feasibility and applicability of the proposed change. It allows frontline nurses to familiarize themselves with the innovation. Thus, it is easier to identify problems, and to make amendment and revision. The pilot study will be conducted for 1 month. The subject enrolment strategies, the evidence-based guideline, the logistics and the data collection method are examined below.

4.2.1 Subject enrolment strategies
Regarding the subject enrolment strategies, the elderly matching the inclusion and exclusion criteria will be included in the pilot study. It is suggested to recruit ten to twelve elderly for the whole intervention. One designated staff in the working group will be assigned for recruitment to assure consistency. Staff responsible for the target recruitment may give valuable ideas for future recruitment plan.

4.2.2 Music intervention guideline

A guideline helps to consolidate and gather all the details of the innovation. The guideline can be freely assessed in both soft and hard copy format in order to allow nurses to review easily. The guideline is simple, user friendly and easy to read. It can review the staff compliance on the implementation of the intervention by assessing whether it can be thoroughly presented. All working group members will try to approach the users individually and informally to seek for opinion.

4.2.3 Logistics

Logistics including manpower, time and duration of the intervention and workflow can be tested. Local setting may contain little variation from the ideal situation, especially with regard to the volume of music and environmental factors. Hence, adjustment may be needed according to real life situation and it may affect the
outcome. Review by the users can give additional comments for better logistic arrangement.

4.2.4 Data collection method

Data will be collected by questionnaire and face to face interview. Demographic data (age, gender and ethnicity), severity of dementia (using MMSE) and brief past history will be collected. Outcomes including client, healthcare provider and system outcome will be carefully assessed. The working group will assign two to three members to execute the music session and collect data to achieve consistency and continuity of assessment.

4.2.5 Post pilot study plan

After implementing the pilot study, information will be gathered by working group members. A post pilot study meeting will be held to evaluate the logistic and reveal deficiencies prior to the actual intervention. An amended guideline will be finalized after the meeting for future implementation.

4.3 Evaluation plan
Evaluation can be divided into process and outcome evaluation. It is important to perform evaluation so as to assess the effectiveness of the intervention. Evaluation helps to think back, to improve and to plan ahead. It is important at one stage to decide whether the innovation is worth continuing in the future. Timely systematic evaluation helps to maintain the innovation up-to-date. Below illustrates the details of the evaluation plan.

4.3.1 Outcomes to be evaluated

Outcomes can be categorized as patient outcomes, healthcare provider outcomes and system outcomes (Polit & Beck, 2012). Patient outcomes account for clinical benefit of the innovation- whether the intervention can result in better health care outcomes.

Primary patient outcome in this evidence-based practice is measured by the frequency of agitated bahaviours. CMAI rates a subject’s agitated behaviours and its frequency over the previous 2 weeks. Outcome will be measured by using the English version of CMAI as it is a tool primarily used to measure the degree of agitated behaviours (Appendix 6). It is expected that music intervention can reduce agitated behaviours in dementia elderly with evidence shown by the CMAI score.
Secondary patient outcome include patient compliance on daily activity. Patient compliance on daily activities is a relative subjective which requires dynamic comments from the patients themselves, their caregiver and close relative and healthcare provider. Through informal chat with the identified targets, qualitative data will be retrieved and assessed.

Besides patient outcomes, healthcare provider outcomes also take into consideration evaluation parameters. Evaluating healthcare provider outcomes include nurse satisfaction, skill and confidence on conducting the innovation, training arrangement, assistance and support from programme coordinator, understanding of the guideline, and acceptance of the guideline. Self-report questionnaire and focus group interview will be performed.

System outcome is another integral part in evaluation. In institutional view, it aims to provide better care to our clients and also better utilization of current resources. It is important to reduce the cost and optimize the resource to provide the best care for the targets. This includes evaluation on the utilization of the intervention- whether the resources are properly and fully utilized, whether the innovation incurs any unfavourable outcomes such as injuries, and whether manpower is well maintained.
Most importantly, it is crucial to find out whether the innovation can reduce cost for the institution as well. In geriatric setting, cost is not only calculated by money but also an integration of staff, caregiver and patient satisfaction. A dynamic and holistic review will be performed carefully.

4.3.2 Nature and number of clients to be involved

The process of evaluation involve all parties including both eligible targets and nurses who experienced in delivering the intervention. Their opinions and ideas are inevitably important for future fine-tuning of the innovation.

Eligible targets recruited for evaluation are identified following the criteria set out by evidence-based music intervention guideline. Inclusion criteria include the target aged over 65, with diagnosis of moderate to severe type of dementia. In addition, patients with hearing impairment are excluded.

Recruitment will be done by convenience sampling and the cases will be followed up until the day of discharge. Quasi-experimental design will be used. Sample size is calculated using JAVA Applets for Power and Sample Size (Lenth, 2006-9). Performing calculation by paired t-test, a total sample of at least 89 patients is needed
to detect a clinically significant difference, with the effect size being 3, power as 80%, alpha as 0.05 and standard deviation as 10. Attrition rate for this innovation is anticipated to be around 5% predicted by the reviewed studies. Therefore, at least 93(93.45) clients will be required for each group. It is expected that this number can be achieved within a twelve month period.

Nurses who have involved in the intervention will take part in the evaluation as well. It is proposed to recruit fifteen nurses. Evaluation includes self-report questionnaire rated from “very agreed”, “agreed”, “neutral”, “disagreed” to “very disagreed” in each aspect (Appendix 9). Focus group interview will be conducted after the intervention (Appendix 9). Their feedbacks are crucial to help make the music intervention sustainable. Working group members will evaluate the questionnaire and sit in the focus group. The aim of the focus group is to collect staff perception and satisfaction on the music intervention guideline. Focus group interview has the advantage of being inexpensive, flexible, elaborative and assistive in information recall (Polit & Beck, 2012). It allows nurses to share and express their opinion on the intervention. Thus, it helps working group members to understand their barriers during implementation. The person in-charge acts as the facilitator in the focus group who tape-records the interview for later review.
4.3.3 Timing and frequency of taking measurements

Timing and frequency of taking measurement varies by different target groups. For patient outcomes, the measurement is short-term. With reference to the reviewed papers, evaluation will be performed three times including pre-implementation stage, implementation stage (week 4 from the start of the intervention) and post-implementation stage (week 8).

With nurses who are involved in the intervention, outcome measurement is intermediate to long-term. Training and execution of the intervention are a sustaining process. It is important to evaluate nurses’ compliance and their views from time to time. After every set of music intervention (8 weeks), evaluation will be performed.

For system outcomes, the measurement is intermediate to long-term. It includes patient length of stay, utilization of resources and manpower. Direct expenses include cost for the implementation of the guideline and maintenance cost. Post-implementation and yearly review of the cost is needed to ensure that it is cost-effective to implement the music intervention in clinical setting.

4.3.4 Analysis of data
Data is collected and analysed to meet the objectives of this intervention.

For the quantitative data, descriptive statistics will be used to describe the characteristics of the target. Significance testing will be used with two-tailed and unpaired t-test. By comparing patients with intervention and with normal care, Chi square test will be performed to compare the target demographic data and MMSE score is presented with mean, standard deviation and p-value. A repeated measures analysis of variance (ANOVA) will be used to compare the differences in the occurrence of agitated behaviours between experimental and control group over time. Statistical significance is set as p<0.05.

Self-rate questionnaire are all rated by numerical. The mean of the rating will be reported.

For qualitative data, the audio-recording will be first transcribed to textual format. Comments will be indexed and labelled into different categories. Finally, categorized comments will be well synthesized to generate key themes and meanings for review.

4.3.5 Determination of protocol effectiveness
The primary indicator comes from whether the music intervention guideline is effective in reducing the frequency of agitated behaviours for dementia elderly. With reference to the reviewed study, the CMAI score can be reduced by three over two weeks. For other patient outcomes, the reviewed study did not provide any reference to follow. The protocol effectiveness is determined by comparing experimental with the control group. An overall positive outcome regards the protocol as effective.

In regards to healthcare provider outcomes, the result from self-rate questionnaire and focus group requires an overall positive feedback. In terms of system outcomes, it is expected that the intervention can give rise to better utilization of resources and manpower arrangement, and aim at not putting extra workload on staff. It is expected that the running cost of the intervention can be kept below HK$1,000 per annum.

4.4 Ethical consideration

Considering ethical consideration, although this is a quality improvement project and approval from the Institutional Review Board is not required, some of the ethical issues such as patient data privacy have to be complied. Data can only be retrieved and seen by authorized persons (Person in-charge and working group members). Formal consent is needed to gain the targets’ agreement in joining this music
intervention. It is also important to ensure client safety during the intervention and plan for contingency plan for all targets and staff involved.

**Chapter 5: Conclusion**

Agitated behaviours in dementia elderly predispose to negative outcomes. Music intervention is an evidence-based intervention that could help to ease the situation. The integrative and systematic review studies provide evidence that music intervention is effective in reducing agitated behaviours in dementia elderly. The assessment of the implementation potential, the feasibility and transferability demonstrate the music intervention can be implemented in local setting. An evidence-based guideline based on the reviewed papers is developed to use in local HK hospitals or nursing homes. With the help of an effective communication plan to the stakeholders, it is believed that the intervention can be smoothly implemented. Further evaluation helps to review the potentials for sustaining the intervention in the long run.
## Appendix 1 Search strategies

<table>
<thead>
<tr>
<th></th>
<th>Medline (Ovid)</th>
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<th>CINAHL (EBSCOhost)</th>
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## Appendix 2 Table of evidence

<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type &amp; Evidence level</th>
<th>Patient characteristics</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcome measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lin et al. (2011)</td>
<td>Randomized, controlled study 1+</td>
<td>Elderly patients with dementia aged &gt;/65 years old</td>
<td>A total of twelve 30-min group music intervention sessions, twice a week for six consecutive weeks (n=49)</td>
<td>Normal daily activities (n=51)</td>
<td>10 weeks</td>
<td>Agitated behaviour</td>
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<td></td>
<td></td>
<td>Recruited from three nursing home facilities in Taiwan</td>
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<td></td>
<td></td>
<td>Measurement tool:</td>
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<tr>
<td></td>
<td></td>
<td>Patient diagnosed by physician using DSM-IV-TR</td>
<td></td>
<td></td>
<td></td>
<td>(1) average scores of agitated behaviour</td>
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<tr>
<td></td>
<td></td>
<td>Spoke Mandarin and/or Taiwanese</td>
<td></td>
<td></td>
<td></td>
<td>(2) physically non-aggressive</td>
</tr>
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</table>

**Interpretation:** Reduce in physically and verbally non-aggressive behaviour and physically aggressive behaviour, verbally aggressive behaviour after the 6th intervention in the experimental group.

DSM-IV-TR – Diagnostic and Statistical Manual of Mental Disorders,4th edition Text Version
C-CMAI- Chinese version of Cohen-Mansfield Agitation Inventory
Efficacy of music therapy treatment based on cycles of sessions: a randomised controlled trial.

*Health.* 14(8), 900-904.

<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type &amp; Evidence level</th>
<th>Patient characteristics</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcome measures</th>
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<tr>
<td>Raglio et al. (2010)</td>
<td>Randomized, controlled study</td>
<td>Diagnosis of dementia according to DSM IV criteria and disease severity level using CDR with a score higher or equal to 2/5, MMSE global score lower or equal to 18/30, Presence of behavioural disturbances</td>
<td>Three cycles of twelve 30-min group music intervention sessions of one month spaced out by one month of no treatment in a total of six months (n=27)</td>
<td>Standard care (educational and entertainment activities such as reading a newspaper), performing physical activities (n=26)</td>
<td>24 weeks</td>
<td>NPI global score (a) 2.58 (p&lt;0.001) (b) not shown</td>
</tr>
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</table>

**Interpretation:** NPI global scores significantly improved in both intervention and control group but higher reduction of the disturbance in the experimental group at the end of the treatment. Each NPI item including agitation significantly improved only in the experimental group at the end of the intervention and one month after the last washout but not in control group.

CDR- Clinical Dementia Rating
NPI- Neuropsychiatry Inventory

### Bibliographic Citation

**Study type & Evidence level**

- Sung et al. (2006) Randomized, controlled study 1++

**Patient characteristics**

- Aged over 65 with diagnosed dementia by the DSM-IV
- Ability to engage in a simple activity and follow simple directions
- Ability to understand Taiwanese or Chinese
- No hearing impairment
- Received no medication for agitation
- GDS score 3-6 (moderate to severe dementia)
- Presence of agitated behaviours assessed by CMAI

**Intervention**

- 8 sessions of group music with movement intervention for 30 minutes in the afternoon twice a week, over 4-week period (n=18)

**Comparison**

- Usual care (n=18)

**Length of follow up**

- 4 weeks

**Outcome measures**

- **Effect size**

  - Week 2: Modified CMAI - 3.85 (p=0.001)
  - Week 4: Modified CMAI - 3.65 (P=0.001)

**Interpretation:** The mean number of occurrence of agitated behaviours in the experimental group in week 2 and week 4 decreased significantly compared to control group.

**DSM-IV-** Diagnostic and Statistical Manual IV criteria (American Psychiatric Association, 1994)

**CMAI-** Cohen-Mansfield Agitation Inventory

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Raglio et al. (2008) | Randomized, controlled study 1++ | Samples recruited from 3 nursing homes in northern Italy | Diagnosed of dementia according to DSM-IV | MMSE score lower or equal to 22/30 and CDR score higher or equal to 2/5 | Not having any music therapy before | 3 cycles of 10 music therapy sessions (30 minutes per session) (n=30) | Standard care(educational and entertainment activities) (n=29) | 24 weeks

**Interpretation:** The NPI score is statistically significance in after 16 weeks and 4 weeks after end of treatment.

**DSM-IV-** – Diagnostic and Statistical Manual IV criteria(American Psychiatric Association, 1994)

**MMSE-** Min Mental State Examination

**NPI-** Neuropsychiatry Inventory

**CDR-** Clinical Dementia Rating

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<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type &amp; Evidence level</th>
<th>Patient characteristics</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Length of follow up</th>
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<td>Sung et al (2012)</td>
<td>Randomized, controlled study</td>
<td>Age of 65 years older diagnosed with dementia</td>
<td>30-min in the midafternoon twice a week for 6 weeks (12 sessions in total)</td>
<td>Usual care (n=28)</td>
<td>6 weeks</td>
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<td>Ability to engage in a simple activity and follow simple directions</td>
<td>Preferred and familiar music which were Taiwanese and Chinese Songs from 1950-1970s with pleasant moderate rhythm and tempo were used</td>
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<tr>
<td></td>
<td></td>
<td>Ability to understand Taiwanese or Chinese</td>
<td>Play various kinds of percussion instruments with movement of extremities (n=27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No severe hearing impairment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presence of behavioural and psychological symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interpretation: The intervention had a significantly lower anxiety score but not significantly different in reduction of agitation than the control groups.

DSM-IV – Diagnostic and Statistical Manual IV criteria (American Psychiatric Association, 1994)
CMAI- Cohen-Mansfield Agitation Inventory
RAID- Rating of Anxiety in Dementia scale

**Appendix 3** SIGN -critical appraisal checklist

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate &amp; clearly focused question.</td>
<td>Well covered</td>
<td>Well covered</td>
<td>Well covered</td>
<td>Well covered</td>
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</tr>
<tr>
<td>Randomization method</td>
<td>Well covered</td>
<td>Poorly addressed</td>
<td>Well covered</td>
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<tr>
<td>Concealment method</td>
<td>Not addressed</td>
<td>Not addressed</td>
<td>Well covered</td>
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<tr>
<td>Blinding</td>
<td>Not addressed</td>
<td>Adequately addressed</td>
<td>Adequately addressed</td>
<td>Well covered</td>
<td>Well covered</td>
</tr>
<tr>
<td>Similar at the start of the trial</td>
<td>Well covered</td>
<td>Well covered</td>
<td>Adequately covered</td>
<td>Adequately addressed</td>
<td>Adequately addressed</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------</td>
<td>--------------</td>
<td>--------------------</td>
<td>----------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Only difference between groups is the treatment under investigation</td>
<td>Not mentioned</td>
<td>Not mentioned</td>
<td>Not mentioned</td>
<td>Not mentioned</td>
<td>Adequately addressed</td>
</tr>
<tr>
<td>Standard measurement</td>
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</tr>
<tr>
<td>Dropout rate</td>
<td>Well covered</td>
<td>Well covered</td>
<td>Not applicable</td>
<td>Well covered</td>
<td>Well covered</td>
</tr>
<tr>
<td>ITT</td>
<td>Poorly addressed</td>
<td>Not addressed</td>
<td>Not applicable</td>
<td>Not addressed</td>
<td>Not addressed</td>
</tr>
<tr>
<td>Carried and compare at different sites</td>
<td>Poorly addressed</td>
<td>Poorly addressed</td>
<td>Not applicable</td>
<td>Not addressed</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Rating</td>
<td>1+</td>
<td>1+</td>
<td>1++</td>
<td>1++</td>
<td>1++</td>
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</tbody>
</table>

### Appendix 4

Level of Evidence (SIGN)

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>Evidence Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1++</td>
<td>High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias</td>
</tr>
<tr>
<td>1+</td>
<td>Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias</td>
</tr>
<tr>
<td>1-</td>
<td>Meta-analyses, systematic reviews, or RCTs with a high risk of bias</td>
</tr>
<tr>
<td>2++</td>
<td>High quality systematic reviews of case control or cohort or studies. High quality case control or cohort studies with a very low risk of</td>
</tr>
</tbody>
</table>
confounding or bias and a high probability that the relationship is causal

2+ Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal

2- Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal

3 Non-analytic studies, e.g. case reports, case series

4 Expert opinion

---

**Appendix 5**

Grade of Recommendation (SIGN)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>At least one meta-analysis, systematic review of RCTs, or RCT rated as 1++ and directly applicable to the target population; or A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results</td>
</tr>
<tr>
<td>B</td>
<td>A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1++ or 1+</td>
</tr>
<tr>
<td>C</td>
<td>A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of</td>
</tr>
</tbody>
</table>
results; or Extrapolated evidence from studies rated as 2++  

D  Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+

Appendix 6 Cohen-Mansfield Agitation Inventory (CMAI)

Time to administer: 10-15 minutes  
1=Never  
2= Less than once a week  
3= Once or twice a week  
4= Several times a week  
5= Once or twice a day  
6= Several times a day  
7= Several times an hour  
29 items  
1. **Pacing and aimless wandering** - constantly walking back and forth, does not indicate normal purposeful walk, include wandering when done in a wheelchair  
2. **Inappropriate dressing or disrobing** - putting on too many clothes, putting on
clothing in a strange manner (e.g., putting pants on head), taking off clothing in public or when it is inappropriate (if only genitals are exposed, do not rate; see item # 28.) Do not rate person’s ability to dress/undress as in ADL’s

3. **Spitting** (including while feeding) - spitting onto floor, other people, etc.; do not include salivating of which person has no control, or spitting into tissue, toilet, or onto ground outside

4. **Cursing or verbal aggression** - only when using words; swearing, use of obscenity, profanity, unkind speech or criticism, verbal anger, verbal combativeness. Nonverbal will be marked under screaming

5. **Constant unwarranted request for attention or help** - verbal or nonverbal unreasonable nagging, pleading, demanding (indicate also for oriented people)

6. **Repetitive sentences or questions** - repeating the same sentence or question one right after the other (Do not include complaining - see item # 18; even if oriented and even if possibly warranted)

7. **Hitting** (including self) - physical abuse, striking others, pinching others, banging self/furniture

8. **Kicking** - strike forcefully with feet at people or objects

9. **Grabbing onto people or things inappropriately** - snatching, seizing roughly, taking firmly, or yanking

10. **Pushing** - forcefully thrusting, shoving, moving putting pressure against

11. **Throwing things** - hurl, violently tossing up in air, tipping off surfaces, flinging, intentionally spilling food

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12. **Making strange noises** - including crying, weeping, moaning, weird laughter, grinding teeth

13. **Screaming** - loud shrill, shouting, piercing howl

14. **Biting** - chomp, gnash, gnaw (people, objects, or self)

15. **Scratching** - clawing, scraping with fingernails (people, objects, or self)

16. **Trying to get to a different place** - trying to get out of the building, off the property - sneaking out of room, leaving inappropriately, trying to get into locked areas, trespassing within unit, into offices, other resident’s room or closet

17. **Intentional falling** - purposefully falling onto floor, include from wheelchair, chair, or bed

18. **Complaining** - whining, complaining about self, somatic complaints, personal gripes or complaining about external things or other people

19. **Negativism** - bad attitude, doesn’t like anything, nothing is right

20. **Eating or drinking inappropriate substances** - putting into mouth and trying to
swallow items that are inappropriate

21. **Hurting self or other** - burning self or other, cutting self or other, touching self or other with harmful objects, etc.

22. **Handling things inappropriately** - picking up things that don’t belong to them, rummaging through drawers, moving furniture, playing with food, fecal smearing

23. **Hiding things** - putting objects under or behind something

24. **Hoarding things** - putting many or inappropriate objects in purse or pockets, keeping too many of an item

25. **Tearing things or destroying property** - shredding, ripping, breaking, stomping on something

26. **Performing repetitious mannerisms** - stereotypic movement, such as patting, tapping, rocking self, fiddling with something, twiddling with something, rubbing self or object, sucking fingers, taking shoes on and off, picking at self, clothing, or objects, picking imaginary things out of air or off floor, manipulation of nearby objects in a repetitious manner

27. **Making verbal sexual advances** - sexual propositions, sexual innuendo, or dirty talk

28. **Making physical sexual advances or exposing genitals** - touching a person in an inappropriate sexual way, rubbing genital area, inappropriate masturbation, when not alone in own room or bathroom, unwanted fondling or kissing

29. **General Restlessness** - fidgeting, always moving around in seat, getting up and sitting down inability to sit still

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**Appendix 7 Estimated man-hours for the intervention**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working group meeting</td>
<td>15</td>
</tr>
<tr>
<td>(3 times x 5 staff x 1 hr)</td>
<td></td>
</tr>
<tr>
<td>Pre-implementation training</td>
<td>22.5</td>
</tr>
<tr>
<td>(1.5hrs x 15 staff)</td>
<td></td>
</tr>
<tr>
<td>Data collection and analysis</td>
<td>30</td>
</tr>
<tr>
<td>(3 staff x 10hrs)</td>
<td></td>
</tr>
<tr>
<td>Preparation and intervention</td>
<td>12</td>
</tr>
<tr>
<td>(6 sessions x 1 hr x 2 staff)</td>
<td></td>
</tr>
<tr>
<td>Focus group interview</td>
<td>15</td>
</tr>
<tr>
<td>(30mins x 10 staff)(2 sessions)</td>
<td></td>
</tr>
<tr>
<td>Evaluation meeting</td>
<td>6.5</td>
</tr>
</tbody>
</table>
Appendix 8 Gantt chart for implementation of music intervention protocol in a 12-month period

Month
1 2 3 4 5 6 7 8 9 10 11 12

Seek approval from managerial nurses
Recruit programme coordinators and 1\textsuperscript{st} meeting
Marketing of the programme
Pilot testing of the protocol & programme logistics
2\textsuperscript{nd} meeting: Amend protocol & operational logistics as indicated
Pre implementation training
Implementation of the music intervention
Evaluation: patient outcome, healthcare provider outcome and system outcome
3rd meeting: Evaluation meeting

Appendix 9

**Self-rate questionnaire and proposed interview questions**

**Self-rate questionnaire on music intervention**

1- Very agreed 2- Agreed 3- Neutral 4- Disagreed 5- Disagreed

Do you feel satisfied with the intervention?
Do you feel competent in conducting the intervention?
Do you fully understand the intervention?
Do you feel the training is adequate?
Do you receive enough assistance when facing a problem?
Do you feel the programme coordinate is helpful and supportive?
Do you think the intervention is beneficial to our targets?
Other comments:

Thanks for your help.

Guiding questions:
1. How do you deal with agitated behaviours in dementia elderly in the past?
2. What factors contribute to the agitated behaviours in the clinical setting?
3. Can you describe your preferred method in dealing with agitated dementia elderly?
4. How do you perceive the nurses’ role in dealing with the problem?
5. What do you think is the most important issue in regards to agitated behaviours in institutionalized setting?
6. How do you perceive the use of music intervention guideline?
7. Is it beneficial to apply the new evidence based guideline? (Client and staff)
7. Can you describe your thoughts about facilitators and barriers of performing the music intervention?
8. Are there any further issues about music intervention guideline you would like to raise concern?

References


Sung, H.C., Lee, W.L., Li, T.L. & Watson, R. (2012). A group music intervention using percussion instruments with familiar music to reduce anxiety and agitation of
institutionalized older adults with dementia. *International Journal of Geriatric Psychiatry*. 27 (6), 621-627.


http://www.who.int/ageing/about/facts/en/index.html