

Creative movement classes to music in a residential aged care facility

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Introduction

The question that this project aims to answer is: “do creative movement classes to music improve the scores for balance, functional mobility and psychological wellbeing for participants in an aged care residential facility?”

This study encompasses the implementation of an original project involving fourteen weeks of movement to music classes at a residential aged care facility, and includes an investigation of the effects of such a project. Recent literature is examined, using sources from clinical research as well as investigating projects and information gained from the fields of music and dance. Some of the effects of the movement classes were observed, measured and recorded and comparisons were made for the results before and after the fourteen weeks. Implications are discussed in the context of other research and suggestions are made for possible future directions for this kind of endeavour. There are multiple potential benefits of such a project, including the investigation of strategies aimed at improving balance, functional mobility and enhancing the feeling of well being of residents of aged care facilities. Of particular focus is the possibility that this kind of activity may be a useful tool in falls prevention. Falls have been shown to be one of the largest preventable contributions to hospitalizations among the elderly (1).

Context

For this project, the setting was the far south coast of NSW, specifically the Eurobodalla region. The area is known for its high proportion of aged. In 2006 in Eurobodalla the proportion of people aged over 65 years was 22.8% compared to 13.3% for that category Australia wide (2). It is widely recognized that in coming decades the population of people over 65 will continue to rise. It has even been dubbed a “demographic time bomb” by more than one federal politician according to numerous radio news reports (3). NSW Health has been aware of the increasing population of the elderly and has developed priorities

and guidelines to address the changing needs of the population. Falls prevention has become one of the key priorities, as well as finding alternative ways to care for the elderly population. This study directly focuses on the elderly in residential care, and reports on the effects of a creative movement class in one such facility.

The (2000) report to the Commonwealth government by Hill et al on strategies for aged care injury prevention identified the need for more opportunities for long term residents of aged care facilities to engage in physical activity, particularly for people living with Alzheimer's disease (4). In the ten years since that report was published, many initiatives have been implemented. One notable example in particular is a widespread rollout of community based Tai Chi classes which are accessible to elderly residents still living at home. The success of this project is described in a study on Tai Chi for the prevention of falls (5). This 2007 article clearly demonstrates that Tai Chi helped reduce the risk and number of falls for participants (consisting of relatively healthy community dwelling older people) in the project. While there is no disputing that Tai Chi is a valuable endeavour, the choice for physical activity for the elderly need not be limited to that one type. There was also a need for a program which was accessible to residents of aged care facilities, with a lower level of functional mobility as a starting point, not just for those who were relatively mobile and still living at home.

Background

A combination of factors precipitated the launch of this project. The researcher has been a physiotherapist for over twenty years, and for as long as she could remember she has been personally dedicated to dance. Knowing that dance has benefits beyond passive entertainment, she completed a bachelor of arts in dance in 1998 at the University of Western Sydney, where she could filter the teachings of the dance academics and choreographers through the therapeutic knowledge of a physiotherapist. In a separate vein, for the past

decade she has worked in regional hospital settings. As a ward physiotherapist it was evident that there was an ongoing need for therapeutic input to assist the elderly to maintain mobility and strength, often without necessarily the need for medical intervention.

The idea for this project started to form at a conference convened by the National Rural Health Alliance, held in Albury in 2007. The National Rural Health Alliance is the peak non-government body involved in action to improve the health of people living and working in rural and remote Australia (6). Rural clinicians such as the researcher are often sponsored to attend such conferences as it is a valuable forum, supported by commonwealth and state governments, that seeks to redress the imbalance of health care services between the metropolitan areas and rural Australia. It was at this eye-opening forum that the researcher first realized that there was a growing, well recognized field defined as "Arts in health", where the benefits of the arts are being seriously considered with applications within the health field. Discussion with an "arts in health" keynote speaker, Marily Cintra(7) at that Albury conference, after relaying my particular skills and location, resulted in a suggestion that the researcher "do something in one of the nursing homes". Thus a seed was planted.

Attendance at a 2009 Arts in health conference in Port Macquarie reveals that this field is continuing to be dynamic and growing. However, audience responses to a keynote talk (8) urging all practitioners to "be involved in research" given by Dr Cheryl Dileo of the Cochrane collaboration, highlighted the fact that there continues to be some resistance on the part of some arts practitioners to be engaged in scientific research. Whether this be due to a perception that arts should not be scrutinized by the cold glare of science, or that engagement in the arts is obviously beneficial, and needing to prove so was an insult, this perception may be a barrier to some progress in the field. This study aims to speak to people with leanings toward either science or art, and share some experiences in the implementation of such a project.

Literature Review

A review of the literature revealed that studies relevant to this project were continually emerging. The studies cited are from varied sources and include subjects with and without dementia. In regards to evidence related to health care, the strongest level of evidence is in the form of a Cochrane review from the Cochrane collaboration (9). This review synthesizes all high quality research based on the question of “interventions for preventing falls in older people”. It concluded that group exercise does reduce the risk and rate of falls in the elderly and that these strategies can be cost saving. A Cochrane review on the effects of music for this population concludes that it is not harmful, and there are some promising results, but urged that more research into this field would be needed before further conclusions could be drawn(10). The recognition of the importance of music is much more vigorously asserted in some qualitative and anecdotal accounts. The popular author and neurologist Oliver Sacks writes on this subject when referring to those with dementia; *“Music is no luxury to them, but a necessity, and can have power beyond anything else to restore them to themselves, and to others, at least for a little while”* (11).

Selected randomized controlled trials which suggest that this intervention may be useful are as follows. Cyarto et al (12) concluded that in retirement villages, group programs have better adherence and compliance in the long term than individual programs. Raglio et al (13) concluded that music therapy can improve relationship skills and reduce behaviour disorders in people affected with dementia. A study set in Taiwan by Sung, et al (14) found that agitated behaviours in institutionalized elders with dementia were significantly reduced in the group that had exercise to music compared to a control group that had “usual care”. Van de Winckel et al (15) did a study which measured cognition and the subjects either took part in a music based exercise group or received individual conversation and attention. This study demonstrated significantly more improvement in the exercise to music group.

Other relevant studies include one by Sherrington et al (16) which is a systematic review. It stated that physical activity can reduce falls in community dwelling people, but that more research is required to investigate the effects of physical activity for those in residential aged care facilities. In a separate systematic review, Heyn et al (17) reported that physical exercise does benefit physical function and cognitive positive behavior in people with dementia.

A study which compared effects of dance to effects of exercise was published recently by Hackney et al (18). The subjects all had the diagnosis of Parkinson's disease. The group who were trained in dance (Tango) showed more improvements in the balance and mobility assessments than the group with exercises. That study was of particular interest because it used some of the same assessment tools as the present project.

To summarise, there is much literature stating that physical activity would be useful in the prevention of falls and its benefits do extend to those already suffering from dementia. There is emerging evidence that engagement in the arts, such as dance and music can be of added benefit over and above effects of physical exercise.

Reliable and valid assessment tools form the basis of any evidence based practice and are basic tools for clinical research. The chosen assessments for this project consisted of the Timed Up and Go (TUG); The Tinetti balance scale and the Geriatric Depression Scale (GDS 15). There have been numerous published studies on the reliability and validity of each of these tools, and the studies cited are meta-analyses. The 2007 article by Van Iersel and team published in the American Geriatric Society investigated the validity and reliability of the Tinetti and TUG assessments among others and concluded that for subjects both with and without dementia, such tools do demonstrate a significant degree of reliability and sensitivity to change (19).

The geriatric depression scale has been identified as a useful tool and has been widely used in state health departments as a screening measurement for psychological well being among the elderly. The geriatric depression scale itself has a few different versions, with differing numbers of questions. These include the GDS 10, consisting of ten questions; the GDS 15 with fifteen questions, and the GDS 30. Mitchell (20) published a meta-analysis of the use of GDS, and concluded that the GDS 15 is “good” for screening for depression among the elderly and exhibits a good degree of specificity and sensitivity. It was the GDS 15 that was used for this study.

Method

Recruitment of Facility

The first stage of finding the subjects within the target population was to recruit a facility willing to participate. Letters of invitation were sent out to all local facilities within the researcher’s local government area. The eventual site chosen was due to a prompt and enthusiastic response from one facility. The particular facility chosen caters for residential needs of an elderly population with a wide range of care needs. It includes self care units, low care (hostel) units as well as high care and dementia specific facilities. The particular population invited to participate were those in the hostel section, at the recommendation of the director of nursing. Incidentally, the Director of Nursing was enthusiastic about this project as she had personal interest in and belief in the benefits of dance.

Ethics

Ethics approval was obtained through the Human Research Ethics Committee (HREC) of the Greater Southern Area Health Service, (GSAHS) in June, 2008. Site specific approval was granted in August 2008. Particular attention was necessary to ensure appropriate informed consent, as some of the participants had the memory loss associated with dementia. After consultation with the

guardianship tribunal it was agreed that consent could be obtained both by the participants and their legal guardians. It was understood by all parties involved that participation was purely voluntary and they were free to leave the program if they desired. Some investigation into the risk of participation required addressing before the ethics committee was satisfied. To address the concern of the ethics committee in that regard, precautions included signed medical release forms and the presence of facility staff during the program. (See appendix 1) All hostel residents of the chosen facility were invited to join in by way of an introductory morning tea. Those who were judged (by the facility staff) to be most at risk of deteriorating mobility were actively encouraged to partake.

Research Design

Design of this project was based on a before and after intervention measurement model. The intervention consisted of once a week group movement to music classes of fourteen weeks duration. All participants were assessed prior to, and at the completion of, the entire intervention.

With the stamp of approval from the HREC and consents and medical release forms signed by each resident's doctor, the assessments and classes could commence. All hostel residents of the chosen facility were invited to join in by way of an introductory morning tea.

Assessments

Each participant was scheduled for an individual assessment, prior to the commencement of the classes, which lasted approximately 30 minutes duration. At the completion of the program, each participant still remaining in the program was scheduled for an additional individual assessment, similarly lasting 30 minutes.

The assessments used that measured functional mobility included a "Timed Up and Go" (TUG) test and a balance assessment called the "Tinetti"

balance tool. They both give a numerical measure which can be interpreted as a category with an associated falls risk. The raw scores for the Timed up and Go test were measured in seconds. The interpretation of the raw data was such that if the participant took more than fourteen seconds to complete the task of getting out of a chair, walking three metres then turning around and sitting down, then they were categorized as being a high risk of falling. The Tinetti test had two components. One was a static "balance" component, and the other was a "gait" component. The scores of each of these sections were added together to produce the total (a number out of 28.) This score was categorized as either being "Low risk" (score greater than or equal to 24); "moderate risk" (scoring between 19 and 23) or "high risk" of falls (scoring less than or equal to 18). The geriatric depression scale (GDS 15) is a series of fifteen questions asking for yes/no answers. This also gives a numerical result which is categorized into a functional group. The number of "depressive" answers was added together with zero to four being classed as "normal range"; five to nine being "mildly depressed" and ten to fifteen being "moderate to severe" depression.

In the initial assessment, each resident was also asked if they had a specific music preference. The music choice for the classes was influenced by the responses of the participants, as well as recommendations from the literature and the available collection of the researcher.

At the "post intervention" assessment session two to three weeks following the completion of the classes, a repeat of the tests were administered, during which each resident was asked if they would like to continue the class and they were also invited to give any comments.

Implementation

The classes were run at a set time each week at the facility. The location alternated between the resident's dining room and a nearby common room (depending on availability of the common room). Equipment required was two

chairs for each resident (one to sit on and one in front to hold on for balance), and a CD/tape player.

The classes themselves were of thirty minutes duration. The activities were guided movements, which used a variety of music, with the overall structure of activities and the order of the music tracks being repeated each week. The particular activities started in the seated position and included warm ups followed by guided "getting out of a chair" always followed by weight shifting and balance exercises. Some activities then focused on fine motor control of their hands, and the session always finished with a relaxation activity. Within the structure of the guided movements, there were sections of the music which allowed for "free movement", of a more creative nature. As the researcher had skills in dance teaching as well as geriatric rehabilitation, there was an opportunity to adjust the set exercises according to the abilities and needs of the participants.

Observations

At the initial session, it was evident that the movement sequences had to be brought down to a very basic level. The timing had to be slowed down and although there were prepared exercises which involved simple steps with arm gestures, the basic components had to be learned and repeated individually. In the first few weeks of the intervention, a step to the side accompanied by a reach to the side was more than the majority could master. The set exercises were adjusted for enhanced simplicity and ease. After a few weeks, the majority of participants were able to master movements requiring more coordination and additional gestures.

Any activity which seeks to improve balance brings with it the risk of falling. There was one incident when one of the participants, despite precautions, landed softly on the ground. There was no injury in this incident and it was apparently one of many falls that had occurred for her that week. The

activity which precipitated that event (a slow turn in a circle) was then removed from the program. Fine tuning the level of activities which challenges participants enough to enhance balance, yet ensures the safety of all concerned is a delicate task, and requires experienced practitioners.

It was of interest to observe the enjoyment evident during the small sections of "free movement" when the participants had an opportunity to enjoy moving how they wished, in response to the music. Some participants who appeared to more commonly display a stern disposition appeared to relax and smile a little more. Indeed, one of the staff members who worked at the facility did state: "there are more smiles on faces". With an extended program this aspect could potentially be expanded and this important aspect relating to well being could represent a potential for future research.

Results

There were twenty two residents who commenced the program in the initial weeks, with data being collected from that number. Of the twenty two, a husband and wife team opted out after one week, and an additional participant opted out after nine weeks. Two of the original twenty two passed away over a Christmas break. There were a total of seventeen participants who completed the classes, with the following results being based on those assessments.

The average age was 80 years, with ages ranging from fifty four to ninety one. The median age was eighty three. Most of the group (12/17) was in the eighty to ninety year age group.

Each of the assessments resulted in a raw score, which could be categorized into a functional group. For both the Tinetti and the Timed up and Go (TUG) test, the functional category is an indication of the risk of falling. The TUG test results in only "low risk" and "high risk" categories, whereas the Tinetti test groups the participants into "low, moderate and high risk" categories. For

both tests, there were only two participants of the seventeen who landed in the “Low risk” category. Most of the participants required the use of a walker in their general mobility.

The “Geriatric Depression Scale” grouped the respondents into three categories consisting of “normal”, “mildly depressed” or “moderate to severely depressed”.

After grouping the participants’ results into functional groups, and comparing the numbers in each group before and after the intervention, there did appear to be some promising results. The tables below summarise the results with the participants being grouped into the categories as described.

Table 1: Timed up and go (TUG) test (Falls risk category)

	Low Risk	High Risk
Before Intervention	12%	88%
After Intervention	18%	82%

n=17. If subject takes greater than 14 seconds to complete task, (using walking aid if necessary) then is categorised as being in the “High Risk” falls category.

Table 2: Tinetti Balance scale (Falls risk category)

	Low Risk	Moderate Risk	High Risk
Before	12%	41%	47%
After	18%	53%	29%

n=17 Categories based on numerical score for Tinetti balance tool, which measures static and dynamic balance and includes gait task analysis

The third and final table is an investigation in the scores which relay psychological well being, and is based on the scores for the Geriatric Depression Scale (15) version.

Table 3: Geriatric Depression Scale (GDS 15)			
	No Depression	Mildly Depressed	Moderate to severely Depressed
Before	59%	18%	23%
After	65%	23%	12%

n=17 Categories based on parameters of numerical scores for yes/no answers to 15 questions regarding feelings of well being and general motivation

It can be seen that there was some movement between the categories for each test, and the numbers were moving towards the lower risk groups for falls and away from the severely depressed group in the depression scale.

Aggregate tables (appendix 2) quantify the movement between the groups for each of the assessments. To summarize, starting with the results of the TUG test, 12% were classified as low risk and the remaining 88% of the participants were in the high risk group initially. One of that group progressed into being in the low risk category at the post assessment session.

There was more movement within groupings for the Tinetti falls risk categories. Initial assessments revealed that there were 12% in the low risk category, 41 % at a moderate risk of falls, and 47% at a high risk. Promisingly, there was a 50% reduction in the number of people in the high risk category following the intervention. Close inspection does reveal that one of those initially categorized as moderate risk, did move to high risk, however all the other movements were towards more improvement. One participant moved from moderate risk to low risk, and four moved from high risk to moderate risk.

For the geriatric depression scale results, there was also a 50% reduction in the number of people in the severely depressed category. Of the people who were in the mildly depressed category initially, 33.3% were classified as not depressed at the end of the intervention and none had moved toward the severely depressed category. Summarising the data using the descriptive data based on categories is useful for revealing overall clinical trends, but is not a rigorous analysis.

A deeper look into the statistical analysis of the results was investigated using the Wilcoxon signed rank sum test. This test was chosen because there were in the raw data one or two "outliers" which could interfere with the results. The Wilcoxon test is able to compensate for outliers. With the small number of participants, and the lack of a control group, the resulting p values (0.21 for the TUG test and 0.81 for the GDS test) were not significant. It was considered that Tinetti falls risk results were of a similar nature, and the p value would again be insignificant. This supports the null hypothesis; that is that the intervention did not have a statistically significant effect in improving the scores for balance, functional mobility and psychological wellbeing.

A summary of the comments of the participants, noted at the post-assessment visit revealed some positive trends. Of the seventeen who completed the classes, three could not remember doing the classes, only two to three weeks afterward revealing some degree of dementia. Fifteen of the seventeen (including one who couldn't remember) stated that they would continue if given the opportunity. A few typical comments from participants include: *"I do enjoy being on the go"*, *"I felt I was achieving something"* also *"Why has it stopped?"* and *"I don't remember, but I usually enjoy that sort of thing"* as well as *"I feel more confident"*. A complete list of the comments can be seen in appendix 3.

Discussion

In regards to the initial question “Do creative movement classes improve the scores for balance functional mobility and psychological well being for residents of aged care facilities”, the answer is no, not significantly.

While statistical significance was not a strong feature of this study, the overall positive response and perceived enjoyment of the participants made it a valuable endeavor. Considering that there was a limited amount of time and resources allocated to this project, it was successful in developing and delivering a program applicable to people in categories commonly excluded from community based physical activity programs, such as those with low levels of mobility and some degree of dementia. Further research would be required to establish definite effectiveness of the program with respect to balance, functional mobility and psychological well being. A number of design and implementation factors could be changed to potentially improve the outcomes. As this population does frequently decline in function over time, inclusion of a control group may have produced more statistically significant results. One way to include a control group is to divide interested participants into two groups, and perform the intervention for just one of the groups while the other group is on a wait list. Admittedly this approach would have been problematic within the hostel setting as general interest was stirred among the residents with quite a few opting to join in after the first week, as they did not want to miss out. For the overall effectiveness, twice weekly would have been more beneficial than just once a week. If musicians are available, at least one study claimed that live music is much more effective than recorded music (21).

The total number of subjects being seventeen, while a good number for a group exercise class, is a very small number for effective statistics. While the statistics could not demonstrate significant improvements for the group, the general perception within the hostel and among the facility staff was very

positive. Some other confounding factors which may have negatively affected the results include the very hot day when five of the residents were scheduled to perform their post intervention assessments. The facility was not air conditioned and the outside temperature was well over thirty degrees on that February day. Such conditions are not ideal for demonstrating the optimal degree of functional mobility for anyone. These are the limitations of a small scale research project, when rescheduling is difficult and the facility director has already allowed generous amounts of their own staff's time and resources to assist in the implementation.

A strength of this study was its ability to attract the target group of older people with significant mobility problems and some level of dementia. Many research projects which have boasted more statistically significant results steer away from these more complex groups. With further development this project could be transferred to populations with high care needs and more severe degrees of dementia. It is these populations that have more limited choices for engagement in physical activities. If the researcher had any doubts about the value of the exercise, a written quote from the director of the facility received approximately three months after completion of the project helped dispel any such thoughts: *"The whole project ran so smoothly and we are still seeing the benefits for the residents who were involved..."* (22). Much was learned much from the action of implementing the project, and the researcher gained personal insights into the pace necessary to progress with group physical activity. It is the opinion of the researcher that although their bodies may have become frail and weak, and their joints aching, the joy of dancing should not be exclusively for the young and very fit. Moving to music is a joyous experience that should be accessible to people of any age and ability. Overall, participation in the project was a uniquely satisfying and enjoyable part of the researcher's work.

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References

1. Hill, K., Smith, R., Murray, K., Sims, J., Gough, J., Darzins, P., Vranstsidis, F., Clar and Richard (2000a) "An analysis of research on preventing falls and falls injury in older people: community, residential aged care and acute care settings". *Report to the Commonwealth Department of Health and Aged Care Injury Prevention Section.*
2. Eurobodalla Positive Ageing Strategy Demographics, Eurobodalla Shire Council 2009
www.esc.nsw.gov.au/site/Publications/Reports/AgeingStrategy/Demographics.pdf
3. www.abc.net.au/rn/breakfast/stories/2009/2569963.htm and

www.abc.net.au/news/stories/2003/11/20/993655.htm

4. Hill, K., Smith, R., Vrandtsidis, F., Nankervis, J., Gilseman, B., and Pettitt, A. (2000b) "Fall prevention activities for older people: a national stocktake" *Report to the Commonwealth Department of Health and Aged Care Injury Prevention Section.*
5. Voukelatos, A., Cumming, R., Lord, S., and Rissel, C. (2007) "A randomized controlled trial of tai chi for the prevention of falls: the Central Sydney tai chi trial" *Journal of the American Geriatrics Society*, 55(8), 1185-91
6. Lawrence, J.C., (1998) Community Service obligations: meaning, impact and application" *Rural Health Information Papers No 3.* Canberra, ACT: National Library of Australia.
7. Cintra, M. (2007) "Arts and health: a successful partnership" in *9th National Rural Health Conference*, Albury, NSW, Australia
8. Dileo, C., Bradt, J., (2009) "Research in the arts and healthcare -Meta-analysis and an agenda for future research" in *The Art of Good health and Wellbeing; International Arts and Health Conference* Port Macquarie, NSW, Australia
9. Gillespie, L.D.; Robertson, M.C.; Gillespie, W.J.; Lamb, S.E.; Gates, S.; Cumming, R.G.; Rowe, B.H. (2009) "Interventions for preventing falls in older people living in the community" *The Cochrane Database of Systematic Reviews*: Wiley (pub)
10. Vink, A.C.; Birks, J.S.; Bruinsma, M.S.; Scholten, R.J.P.M. (2003) "Music therapy for people with dementia" *The Cochrane Database of Systematic Reviews*: Wiley (pub)
11. Sacks, Oliver. "Musicophilia-Tales of music and the Brain" Picador, (2007) p. 347.
12. Cyarto, E.V.; Brown, W.J.; Marshall, A.L. (2006) "Retention, adherence and compliance: Important considerations for home and group based resistance training programs for older adults." *Journal of Science and Medicine in Sport* 9 (5) 402-412
13. Raglio, A.; Ubezio, F.; Puerari, M.; Gianotti, G.; Bellelli, M.; Trabucchi II; Villani, D. (2006) "The effectiveness of the music therapy treatment for patients with moderate-severe dementia" *Giornale di Gerontologia* 54 (3) 164-169
14. Sung, H.C.; Chang, S.M.; Lee, W.L.; Lee, M.S. (2006) "The effects of group

music with movement intervention on agitated behaviours of institutionalized elders with dementia in Taiwan" *Complementary Therapies in Medicine* 14(2) 113-119

15. Van de Winckel, A; Feys, H.; De Weerd, W.; Dom, R. (2004) "Cognitive and behavioural effects of music-based exercises in patients with dementia" *Clinical Rehabilitation* 2004 18(3) 253-260.
16. Sherrington, C., Lord, S., and Finch, C. (2004) "Physical activity interventions to prevent falls among older people: update of the literature" *Journal of Science and Medicine in Sport*, 7 (1 suppl), 43-51
17. Heyn, P., Abren, B.C. and Ottenbacher, K.J. (2004) "The effects of exercise training on elderly persons with cognitive impairment and dementia: a meta-analysis" *Archives of Physical Medicine and Rehabilitation*, 85(10), 1694-1704.
18. Hackney, M.E.; Kantorovich, S.; Levin, R.; Gammon, E. (2007) "Effects of Tango on Functional Mobility in Parkinson's Disease: A Preliminary Study" *Journal of Neurologic Physical Therapy* 31 (4) 173-179
19. Van Iersel, M.B., Benraad, C.E. and Olde Rikkert, M.G.M. (2007) "Validity and Reliability of Quantitative Gait Analysis in Geriatric Patients with and without dementia" *Journal of the American Geriatrics Society*, 55(4), 632-634.
20. Mitchell, A.J., Bird, V., Rizzo, M., and Meader, N. (2009) "Diagnostic validity and added value of the geriatric depression scale for depression in primary care: A meta-analysis of GDS (30) and GDS (15)", *Journal of Affective Disorders*, (Available on the internet, accessed Jan 2010)
21. Homes, C.; Knights, A.; Dean, C.; Hodgkinson, S. Hopkins, V. (2006) "Keep music live; Music and the alleviation of apathy in dementia" *International Psychogeriatrics* 18 (4) 623-630
22. Spence, H. (2009) Director of Nursing, Dalmeny Retirement Village, Illawarra Retirement Trust, Dalmeny NSW

Additional References consulted for this project

23. Aldridge, D. (ed) (2000) *Music Therapy in Dementia care*, London: Jessica Kingsley Publishers.
24. Almeida, O.P. and Almeida, S.A. (1999) "Short versions of the geriatric depression scale: A study of their validity for the diagnosis of a major

- depressive episode according to ICD-10 and DSM-IV" *International Journal of Geriatric Psychiatry*, 14,858-865.
25. Axelrad, S., and Argov, E. (2007) "Group activity for demented adults- feasibility and effectiveness" *Clinical Rehabilitation*, 21(11), 977-986.
 26. Brown, S., and Parsons, L.M. (2008) "The Neuroscience of Dance" *Scientific American*, 299(1), 58-63.
 27. Buchman, A.S., Boyle, P.A., Wilson, R.S., Leurgans, S., Shah, R.C., and Bennett, D.A. (2008) "Respiratory muscle strength predicts decline in mobility in older persons" *Neuro-epidemiology*, 31(3), 174-180.
 28. Cevalasco, A. and Grant, R. (2003) "Comparison of different methods for eliciting exercise-to-music for clients with Alzheimer's disease" *Journal of Music Therapy*, 40(1), 41-56.
 29. Cipriany-Dacko, L., Innerst, D., Johannsen, J. and Rude, V. (1997) "Interrater reliability of the Tinetti balance scores in novice and experienced physical therapy clinicians" *Archives of Physical Medicine and Rehabilitation*, 78(10), 1160-1164.
 30. Gillespie, L.D., Robertson, M., Lamb, S., Cumming, R. and Howe, B. (2003) Interventions for preventing falls in elderly people" *Cochrane database of Systematic Reviews (online)*, available (accessed 7/5/08).
 31. Howe, T., Rochester, L., Jackson, A., Banks, P., and Blair, V. (2007) "Exercise for improving balance in older people" *Cochrane database of Systematic Reviews (online)*, available (accessed Dec 2007).
 32. Koger, S.M., Chapin, K. and Melissa, B. (1999) "Is music therapy and effective intervention for dementia? A meta-analytic review of literature" *Journal of Music Therapy (online)*, available: (accessed Jan 2008).
 33. McGinty, S., Masters, L. and Till, D. (1999) "Inter-tester reliability using the Tinetti gait and balance assessment scale", *Issues on Aging*, 22(1) 3-5.
 - Thornton, K.S and Hatton, C. (2004) "Music interventions for people with dementia: a review of the literature" *Aging and Mental Health*, 8(1), 3-12.
 34. Thornton, K.S and Hatton, C. (2004) "Music interventions for people with dementia: a review of the literature" *Aging and Mental Health*, 8(1), 3-12.
 35. Woods, B., Spector, A., Jones, C., Orrell, M. and S, D. (2005) "Reminiscence therapy for dementia", *Cochrane Database of Systematic Reviews (online)*, available: (accessed Dec 2008)

Appendix 1



Medical Practitioner Consent Form

The resident _____ of Dalmeny IRT nursing home has the opportunity to participate in a research program conducted by the physiotherapist Rachel O'Loughlin, involving creative movement classes to music. The 14 week program of exercises will be of low intensity and the weekly class will be of 30 minutes duration. Movements will be adapted to suit a wide range of physical abilities. Enclosed is an information sheet for more details. Conditions which would exclude exercise participation according the Heart Foundation guidelines include

- Unstable ischaemia
- Acute myocarditis or pericarditis
- Severe and symptomatic valvular stenosis or regurgitation
- Heart failure that is not compensated
- Uncontrolled arrhythmia
- Complex Congenital heart disease (unless certified by Cardiologist)
- Other medical conditions that could be aggravated by exercise

If you believe the abovementioned resident is medically stable enough to participate in the creative movement classes to music, please sign and return this document via the enclosed envelope. Please provide any additional comments below and on the reverse of this form if more space is required.

I (Print name of Medical Practitioner) _____ agree that

_____ is medically stable and able to participate in the creative movement classes to music.

Signed: _____

Date: _____

Appendix 2

TUGR counts					
Before	TUGR	After			Total
		1	2	3	
	1	2	0	0	2
	2	0	0	0	0
	3	1	0	14	15
	Total	3	0	14	17

TUGR percentages					
Before	TUGR	After			Total
		1	2	3	
	1	100.0%	0.0%	0.0%	100.0%
	2	0.0%	0.0%	0.0%	0.0%
	3	6.7%	0.0%	93.3%	100.0%
	Total	17.6%	0.0%	82.4%	100.0%

TFR counts					
Before	TFR	After			Total
		1	2	3	
	1	2	0	0	2
	2	1	5	1	7
	3	0	4	4	8
	Total	3	9	5	17

TFR percentages					
Before	TFR	After			Total
		1	2	3	
	1	100.0%	0.0%	0.0%	100.0%
	2	14.3%	71.4%	14.3%	100.0%
	3	0.0%	50.0%	50.0%	100.0%
	Total	17.6%	52.9%	29.4%	100.0%

GDS counts					
Before	GDS	After			Total
		1	2	3	
	1	9	1	0	10
	2	1	2	0	3
	3	1	1	2	4
	Total	11	4	2	17

GDS percentages					
Before	GDS	After			Total
		1	2	3	
	1	90.0%	10.0%	0.0%	100.0%
	2	33.3%	66.7%	0.0%	100.0%
	3	25.0%	25.0%	50.0%	100.0%
	Total	64.7%	23.5%	11.8%	100.0%

Appendix 3

Collated comments from NH participants

At post assessment:

"I couldn't come all the time, but it was OK" "I would join in with the group if it were to continue running"

"Why has it stopped?" "I would continue the classes if they were on"

"Oh yes I'll do it again"

"I do enjoy being on the go" "I like to please the people taking an interest in you" "I don't want to give up because you're old" "I don't like to be pushed"

"I can't remember the classes" "There's something wrong with my feet"

"I feel a little more confident" "Yes I would continue the classes if they were to continue"

"I enjoyed the class" "I would continue to come if they were still on"

"The arthritis is not as bad as it was before" "I enjoyed the class till I fell over" "I would join in again" (Participant had vertigo, had a slow non-injurious fall during a turning activity; and had had a number of falls that week.) "Don't be in too much of a hurry for your daughter"

"I enjoyed the class" "I would continue the class"

"I had a good time, enjoyed the classes" "I felt I was achieving something" "I enjoyed the company" "I would continue if they were still being run"

"The class was a good thing" "I would continue quite happily"

"I can't remember, but I usually enjoy that sort of thing"

"I enjoyed the classes" "It would be nice to continue"

"I enjoyed the class" "It wasn't really line dancing, but I enjoyed every minute"

"I don't remember the class"

"I'm not feeling well today" "I would probably continue if they were still on"

"I enjoyed the class, and would do it again"

Collated comments from NH staff

"The participation is much better" "There are more smiles on faces"
(NH physio)

Appendix 4: Dance/Exercise guidelines

1. Warm Up (Duke Ellington)

Start sitting, do some gentle movements starting from the feet/ankles, (circles, up and down) then knee straightening alternately (approx 5x each leg), then weight shifting in the seat, side to side, and sitting back; then some deep breaths, with posture reminders, then move up to the shoulder, arm and elbow bending and straightening. Stretch the hands and fingers out, and in, then shoulder circles, back to a few deep breaths, then gentle head turning, then gentle shaking out of hands. (If more music, do some more breaths, and weight shifting in the chair and posture reminders.)

2. "Stir the Pot" (Aaron Neville)

Start with sitting, weight shifting side to side in the chair. Hand gesture; one hand across body, around (palm up), other hand same gesture, then both hands, (stirring pot) one way then the other, (with weight shifting) then hands up (palms together) middle, above head and outwards; back to weight shifting in chair. Repeat 2 times. Practice pushing up in chair (just a little), back to rocking side to side. In instrumental section, push up all the way into standing. Perform weight shifting in standing side to side. Repeat hand gesture in standing, alternate with rocking side to side.

3. "Chicago" (Frank Sinatra)

Standing if possible, clapping thighs then hands in (slow) time. Make sure both knees are bending a little each time the thighs are clapped. Alternate this action with step and kick out to side. (Demonstrate with stepping on a slightly bent leg) Next action is marching on spot, try to encourage high knees and swinging arms. Return to the clapping mid song, encouraging knee bends. Repeat other two actions. (If all actions are mastered, could try doing clapping and marching in quicker time) Allow shaking of hands at end of song.

4. Foot tapping (Ella Fitzgerald)

Everyone standing. Alternate two actions of feet; While standing on one leg, other leg taps forward / side / back/ together. Repeat on other leg. Repeat entire sequence numerous times. Next action is while standing one one leg, other leg taps forward /back / forward together. Repeat numerous times. In middle of song, gentle knee bends in time to music to help refocus. Then return to one of the tapping patterns. (If all actions are mastered, try to encourage "soft knees", or slight bends on the supporting leg while opposite foot is tapping)

5. Hand dance (Ella Fitzgerald)

Everyone sitting. Follow lyrics of song. "Four leaf clover"; move four finger across body, and move into pocket area. "Lucky penny" have thumb and index finger together, turn wrist over while moving hand across body, then on to chest. "lucky horseshoe" over door, reach across body and up above head and outwards, encouraging and demonstrating stretch upwards. During instrumental section stand up, and go into gentle knee bobs. Next action small side-together, side together steps. When lyrics return, do hand gestures in standing. Demonstrate with gentle knee bobs in time. Allow some "free movement " or shake out at end of song.

6. Swing song (Staple singers)

Standing. Side step action (step together/step together) with one arm reaching out to side, same direction as stepping. Try to encourage step onto slightly bent knee (starting small, then stepping deeper out to side) Alternate with marching with high knees. Repeat both actions a few times. Later in song, reach both hands (shaking) upwards on one side, then up on other side, then down shaking on one side and down on the other side. Go back to side steps, and repeat hand shaking gesture. Allow another "shake out" at end of song.

7. Line Dance (Hank Williams)

Standing if possible. (Encourage clapping throughout if sitting). Establish beat with step (to side) then clap (feet together); (step/clap/step/clap). Repeat for a little while. Next action is "heel /toe/heel together" Repeat on other side. Can demonstrate with hand(s) hooked on front waistband. Repeat heel toe section approx four times each side. Return to step clap section, alternate with knee bends in same time. Also do marching on spot while clapping to alternate movements. Return a few times to heel/toe section.

8. Relaxation (Classical)

Everyone sitting. Ensure good posture, symmetrical, feet flat on floor. Eyes can be closed if they want. Encourage a few slow breaths, then work through the body starting at the feet, tensing and relaxing parts of the body, working upwards through legs, hips, trunk and arms. Particularly encourage symmetry, open chest, relaxed shoulders, and back well supported in chair. Hands resting easily on thighs. Allow the music to be heard, repeat the breathing instructions a few times. May add some relaxing imagery if desired. Gentle recovery after a few minutes, encouraging small hand/ toe movements, eyes open and wake up. Stand up again slowly.