



PAPER ON: THE BENEFITS OF DANCE ON HEALTH AND WELLBEING - PRESENTED AT THE WORLD DANCE CONGRESS 2015 -ATHENS 1-5TH JULY 2015

Author (Visiting) Professor (Lady) Christine Bamford, MPhil, FCIPD

PART 1. WHY WE ARE - WHERE WE ARE?

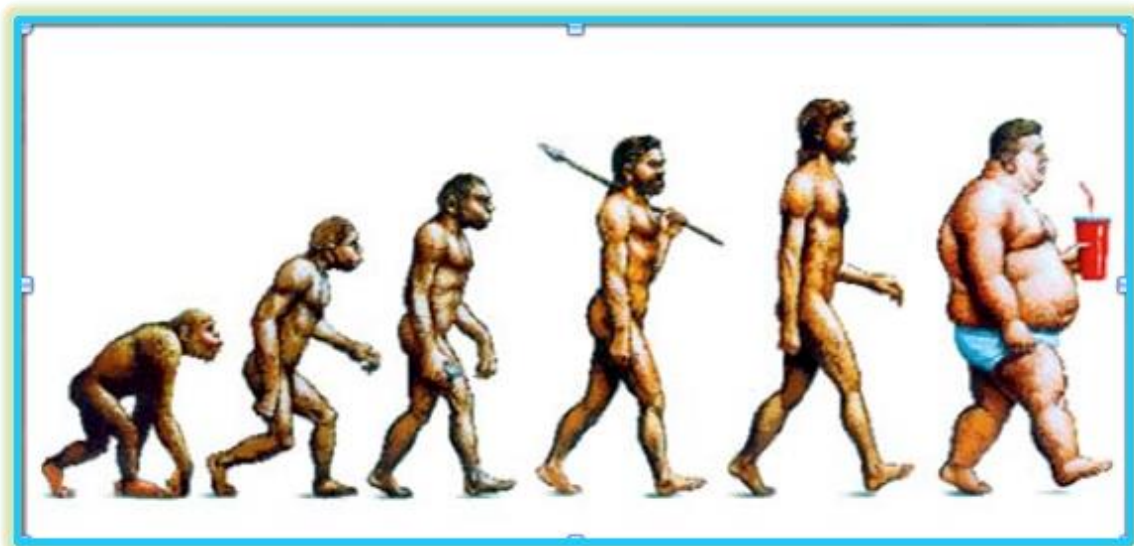
Within a few decades we are about to lose the last of the “accidentally well” the post war generation who acquired a level of health, fitness and cognitive ability that they did not set out to earn. The level of health was due to the time they were born not by any fitness or nutritional regime. Post war children could play out of doors, walk to school, create their own entertainment and were given milk, vitamin enriched orange juice and walked home for lunch

for home cooked meal. High calorie fast food, and sugar enriched fizzy drinks were not available. The words refined “carbohydrates and trans-fatty acids” did not appear in anyone’s language. There were no computer, mobiles, game consoles, internet and a television set in a home was not the norm.

Prior to 1980 type 11 Diabetes was relatively rare - by 2010 it had risen to between 6-8 % of the population (dependant on country). The US and UK demonstrating the greatest growth.

In the 80’s health experts recommended that the population adopt a low fat diet. The simple message was well accepted, it seemed reasonable to assume that less fat in the diet meant less fat in the body. However, decades later it has become clear that a **“Good fat” message might have been a better message**

THE OBESITY EPIDEMIC



Source Authors re-elaboration The Economist 2003 cover

In 3-4 decades man has undone 5-6 million years of evolution

It took 6 million years to transition from ape to man. But it has taken 3 -4 decades (a blink of the eye in evolutionary terms) to transition a genetically stable population to one that is 67% overweight and obese. The genetic biological system was set hundreds of years ago. Early humans consumed fish, seafood, vegetation and meat in their diet - providing all the nutrients needed for human bodies and brains, including the capacity for complex abstract thought. The central nervous system was tightly regulated regarding glucose and insulin balance. Human’s biological systems move slowly and cannot keep pace with rapid change. The impact of a lack of activity and poor nutrient has had severe consequences and has adjusted the phenotype.

The consequential impact has resulted in doubling – or tripling rates of diabetes, obesity, heart disease, stroke and cognitive decline is on the increase.

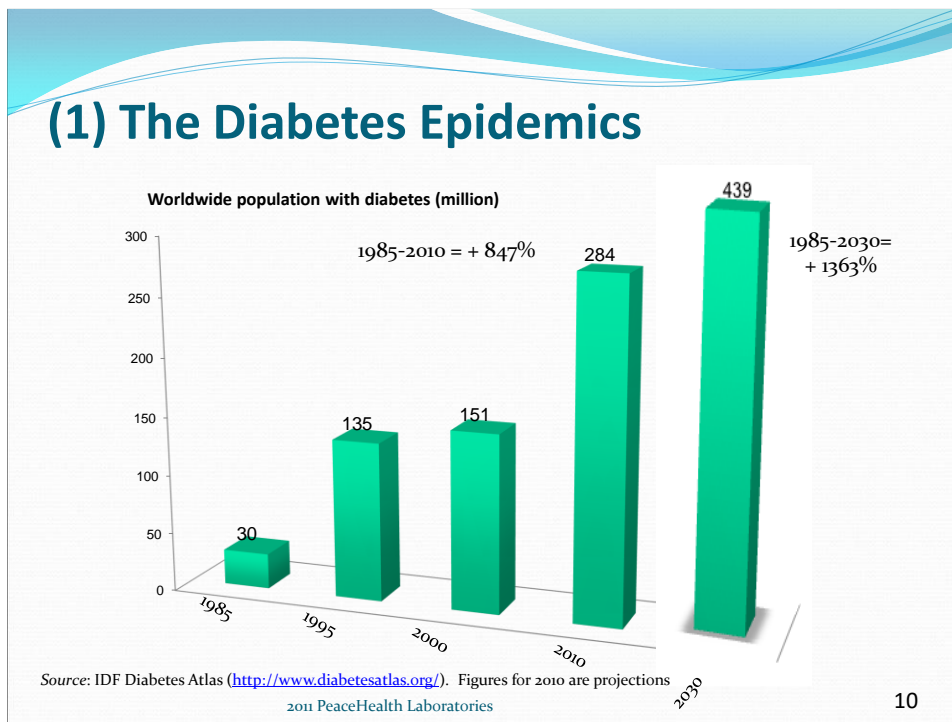
In 2015 it was estimated 2.3 billion of the global population were overweight

Until recently it was assumed that an individual’s genetic disposition was largely responsible for cancer. People believed that cancer sufferers were unsuspected victims. Increasingly research studies confirm that unhealthy behaviours and environment may be a significant contributor to increasing levels of cancer Brigitte Piniewski, MD, commented “Lifestyle choices such as activity, nutrition, can either “dial up” or “dial down” the prevalence of cancer and other chronic diseases”

Today a lifestyle with little activity coupled with significantly refined carbohydrate loads wrecks havoc with nervous and immune system. Modifying lifestyle (including activity and diet) would deliver a reduction of 60% of some cancers and 83% less heart disease. .

Post World War II it was assumed all people were well until diagnosed ill. Piniewski commented “individuals were free to exist within their communities as long as they had the basic living conditions (housing, food, water) Parents did not need to know how much exercise or what types of nutrient their children needed to be healthy” Piniewski commented “the underlying assumption was that every incoming generation would, at a minimum, access the outcomes of the outgoing generation. In other words the younger generation would be smarter, fitter, faster, and healthier than the preceding generation”. Sadly this is not the case. The epidemic rise in T2 Diabetes in children and young people and the slowing of cognitive development due to poor nutrient are testimony to the retrograde step in the health and wellbeing of children and youth of today

FIG 2



In the UK patients with long term condition consume 70% of the health budget. Patients with more than one chronic condition are set to increase 2.9 million by 2018 – equivalent to another £5 billion spend. In the US 75% of healthcare spend is on chronic care management.

The model of acute hospital care will not be able to cope with the increasing volume of individuals seeking care. The traditional model of hospital care will need to readjust to accommodate lifestyle mediated conditions (70-85% of health conditions are lifestyle mediated)

The World Health Organisation research indicated that the global rise in obesity (and associated conditions) is due to entirely to the **drop in activity** and a **switch from farm to factory** foods (diet/nutrient) - consistent regardless of population or country.

Globally there are profound social implications regarding the evolving epidemic of T2 diabetes in children and young people. What will the future hold for a whole generation who are managing diabetes through medication? What is the impact of poor diet and nutrition on the cognitive ability of a whole generation of young people? How will that in turn impact on the “knowledge” industry job market of developed countries and consequently on economic vitality and growth?

In summary the emergent explosion in chronic diseases have arisen as a result of:

- Preventable poor health,
- Lifestyle, diet and inactivity
- A model of acute hospital care which fails to meet the explosion in lifestyle induced conditions.

If population health is to be improved there is a need for a societal shift towards health self management. Piniewski comments “*citizens can no longer be passive recipients of healthcare but co-creators of their own health and wellbeing*”

PART 2. THE IMPACT OF DANCE ON WELLBEING

The wellbeing message has been received by the population – High profile endorsements from Richard Branson to President Obama promote the message “**get active -get fit**” - but adoption is not moving fast enough to stem the explosion in chronic diseases.

Big business has spotted an opportunity. The major Technology giants Microsoft, Google, Apple are investing heavily in health and wellness. Fitness band, activity trackers, smart watches, I-phone apps, drones, Doctor on line, Patients like me, in-home technology monitoring, remote diagnosis, the list is endless. Everyone can be their own Doctor now!

Google have joined with Johnson and Johnson to invest in research for robotics and believe it is their duty to promote health management. Silicon Valley are investing technology profits into research on sustaining longevity and wellness. The journey has begun to promote self management of care. There is an acceptance (if not adoption) of the fact that physical fitness and diet contribute to health and wellbeing.

Fitness and Diet whilst important are not the only factors to be considered in mediating lifestyle – there are other more intrinsic influences. The importance of self esteem, mental acuity, physical mobility (for those less able), motivation and social connectivity

Part 2 of the paper sets out to explore how **Dance offers a holistic approach** to health and wellbeing

Dancing makes a difference to young people

Part 1 highlighted the concern regarding the epidemic of T2 Diabetes in children and young people and the impact on cognitive and physical development affecting the economic vitality of countries. The following research highlights examples of Government and non Government bodies working together to address the health of children and young adults through dance.

Dance and Health, Department of Culture, Media and Sport, Arts Council England and NHS (2006) report highlighted the successful outcomes from “Youth Dance England – Dance in and beyond schools “ as follows:

“Dance is an appealing activity for young people especially for those resistant to participating in competitive sport. It can promote general wellbeing, healthy attitudes to the body and lifestyle choices. Dance can play a role in changing attitudes to a range of health issues including teenage pregnancy, drug and alcohol abuse. As well as physical benefits there are also personal and social benefits, including improved psychological well being, greater self-confidence and self-esteem, increased trust, better social skills and reduced isolation and exclusion.

The Go Dance Research Project (2012) commissioned by a consortium of dance organisation enrolled 250 children (age 10-12) to participate in 12 week course to examine how dance might positively impact the lives of boys and girls pursuing healthy lives. The findings indicated that boys’ perceptions of pressure and tension (as an indicator of intrinsic motivation) reduced as a result of participation in dance. Male participants and their school teachers related their focus in other curricular subjects to their participation in these workshops. Other results from this study indicate that participating in a dance project during school time can inspire positive behaviour and change in terms of physical activity levels. The Go Dance research project was awarded a **Cultural Olympiad Inspire Mark** and work continues today.

Dance 4 your life (2009) delivered an energetic dance programme to over 50 adolescent girls. The findings demonstrated significant increases in physical fitness and upper body strength. Self esteem also increased significantly and reported high levels of intrinsic motivation towards dance (pre and post evaluation)

NRG Dance Research Report (2005) Trinity Laban (Big Lottery Wellbeing funded) delivered a 10 week creative dance class with over 300 school children (11-14 years old). The research demonstrated that physical fitness increased significantly amongst females (often a hard to reach group for engagement) and positive adaptation were evident in males. Males and females evidenced improvement in psychological wellbeing. Research has also found positive relationship between physical activity behaviours during adolescence and levels of physical activity in later life. In adolescents it has been found that increased cardio respiratory fitness can be correlated to a decrease in total body fatness (Ortega et al 2008) and evidence of physical activity in early childhood can delay onset of increasing body fat (4-6 years)

The wealth of research findings indicate that engaging young males and females at an early age, will have a positive impact on physical and psychological wellbeing and may

reverse the negative trend of inactivity. Boys will also benefit from dance – but the approach to teaching and method used needs to be considered.

Dancing makes you smarter:

For centuries dancers and authors have lauded the health benefits of dancing – usually as physical exercise. However, recent research study findings have evidenced other benefits, such as stress reduction, increased serotonin level (sense of well-being). Richard Powers, Stanford University (California) paper announced *frequent dancing apparently makes us smarter!* A major study added to growing evidence that stimulating one's mind by dancing can ward off Alzheimer's disease and other dementia. Although physical exercise can keep the **body** fit **Dancing also increased cognitive acuity at all ages.** New England Journal of Medicine reported on the effects of recreational activities on mental acuity in ageing. The outcomes from the study indicated:

- Reading 35% reduced risk of dementia
- Bicycling and swimming 0%
- Crossword puzzles 4 days a week – 47%
- Playing golf – 0%
- **Dancing frequently 76% - greatest risk reduction of any activity studied – cognitive or physical**

Dr Robert Katzman, Neurologist, indicated that “dancers are resistant to the effects of dementia as a result of having greater cognitive reserve – and increased complexity of neural synapses. Participation in mentally engaging activities lowers the risk of dementia by improving neural qualities”

Harvard Medical School psychiatrist Dr Joseph Coyle also commented “The cerebral cortex and hippocampus” are critical to activity and are remarkably plastic – they rewire themselves based on usage” he continued “when brain cells die and synapses weaken with ageing, our nouns go first – like names of people – because there is only one neural pathway connected to that stored information. If the single neuron fades – we lose access to it. Dr Katzman emphasises ... More is better **Do whatever you can to create new neural paths.**

Neuroscience educator Robert Sylwester stated “mobility is central to everything that is cognitive”

Is one type of dancing better than another?

The Harvard study was not conclusive as to whether one dance form was better than other but the message given. “When improving your mental acuity **involve yourself in activities which require split-second rapid fire decision making.** New and different classes are better for you as they create a greater need for new pathways. **Dancing integrates several brain functions at once – kinaesthetic, rational musical, emotional – further increasing neural connectivity. Dance as much as you can. More is better!!”**

An extensive literature search undertaken by Trinity Laban Conservatoire of Music and Dance in 2010 explored the psychological and physiology (eg Parkinsons, Alzheimers, Depression, etc) impact of dance on older people 50+ - included health and physically and psychologically impaired cohorts. Categories included fitness and strength, balance and gait, general psychological wellbeing such as self confidence, social inclusion and cognitive function. Dance styles covered included social dance (Verghese, 2006) creative and contemporary dance, (Bertram and Stickley 2007) traditional dance (Eyigor et al 2009)- Turkish folklore, Greek and Irish Ceilli.

Whilst the Laban literature research did not elicit an outcome that one form of dance is better than another. A number of interesting finding emerged.

- A systematic review of 18 studies concerning physical benefits of dancing for healthy older adults indicated that adults could “significantly improve their aerobic power, lower body muscle, endurance, strength and flexibility balance, agility and gait through dancing”
- **Aerobic dance** amongst middle age women - aerobic dance was shown to promote weight loss (Adachi, Takahashi & Tanaka 1998). The **Zumba** success, one could claim, is due to the fact that you don’t have to be a dancer to be able to move to music. Anyone can do it.
- **Traditional dance** - A study focusing on traditional **Korean** dance amongst elderly reported increases in lower body strength, flexibility with some reductions in weight, body fat, heart rate and blood pressure **Turkish dance** study on females over 65 years - after 8 weeks dance based intervention improvements were seen in functional performance tests eg 20m walk test, stair climbing and chair rise time. A 10 week **Bangra-cise for Asian women aged between 65-75**. Positive outcomes included participants attitude to taking part in physical activity (Nordin & Hardy 2009) **Greek Dance 10 week study** produced improvements in balance (through a decrease in centre-of-pressure variation and trunk sway in one legged stance). An increase in trunk rotation was noted when performing some of the post test assessments (Sofiandis, Hatzitaki, Douka & Grouis 2009) **Traditional ballroom** as dance therapy in **Brazil** found the dance form allowed participants to “establish cultural connections to the larger **Brazilian dancing** culture” **Waltz dancing** in patients with Chronic heart failure demonstrated a new form of exercise training that produced significant improvements (Belardinelli R, et al 2008) A study (McKinley et al 2008) on ages 62-91 years on the effects of **walking and Argentine tango** - although a small study the outcomes perceived that **Tango resulted in greater improvement** than walking. Another study on **Tango** produced results that Tango aided functional mobility for those with mild to moderate Parkinson’s disease (Hackney & Earthart 2010) **Caribbean dance** - study - adults and young demonstrated significant improvements in balance (Federici, Bellagamba & Rocchi 2005). **Partnered and non partnered dance** - (Parkinson’s disease study) appeared similarly effective in terms of physiological impact. **Line Dancing** -“we are too busy being active and enjoying ourselves to feel the aches and pains - perceived “Health benefits” of line dancing in older women (Nadasen KN 2008) **Belly dance** low impact activity, minimally stressful on body’s joints, strengthened muscles in the upper back, shoulders and abdomen (Egyptian, Tribal and winged dance) (Simon R, MD - Second Opinion Journal (2015)

- **Simple dance based exercise** A randomised control carried out among individuals in residential care in the Czech Republic – variety of test such as 2 minute step test, chair “Sit and reach test” – the experimental group outperformed the control group. The intervention described by researchers as a “relatively simple dance-based exercise.
- **Seated dance/exercise** In a separate study, Julie Robinson (Move it or Lose it) and Professor Janet Lord, Director for the Centre of Health Ageing Research, at University of Birmingham, evaluated the benefits of seated exercises and the prevention of falls. Of note was the “Wellness” evaluation using Short Physical Performance Battery (SPPB) - project partners Age UK/St Giles Hospital/Dove Housing. Results included Improved SPPB on average by 15% greatest improvement 67%: 85% improved gait: 96% increased number of chair rises – greatest improvement being 68%

Spiritual and Emotional impact of Dance

In the words of Scott Nilsson *“Dance is the poetic baring of the soul through motion”*

Dance harnesses the soul – it is the soul that turns physical activity into an art form - that touches the emotion of the dancer and audience.

Not surprisingly there is a dearth of research on the spiritual impact of dance. However, there is no shortage of eminent people who have been moved to try and describe why the connectivity between movement, soul and spirit is important. Below are a few abstracts

- *Linda Rabin “Dance is movement. Movement is life. It is with the body that we dance and in the body we feel movement of life and what animates this life? That is a mystery, this mystery is whispering through our tissues, and if we pay close attention, we can feel it's murmurings as undulating waves, resonating from the tiniest cells to the vastness of the universe. To dance is to swim in these waters of the Mystery of Life.”*
- *D H Lawrence “We ought to dance with rapture that we might be alive and part of the living “*
- *“Dance for yourself - if someone understands you, good - if not - no matter, go right on doing what you love” - Lois Hurst*
- *“Music and rhythm find their way into the secret places of the soul” - Plato*
- *“To express what is the most moral, healthful and beautiful in art - this is the mission of the dancer and to this I dedicate my life “ ... “there are those who convert the body into a luminous fluidity surrendering it to the inspiration of the soul” Isadora Duncan*

Whilst there is a little research regarding spirituality and dance there has been considerable research undertaken regarding emotions or psychology of dance – **Dance** helps students to develop a sense of self as an **emotional and social being**.

Recognising Emotion in Dance -

Adults.

A study based on **Laban Movement Analysis** categorises human movement based on the duration of time and tempo change, expansion of limbs, tension and dynamics of movement. In an experiment subjects viewed 20 videos of dancers performing the same dance attempting to convey anger, fear, grief or joy. The subjects assessed the videos at an above chance level. The highest recognition rate was for grief, followed by anger. Fear was expressed with low fluency and many contractions of the body, joy with fluid motion and grief with frequent transitions between motion and pauses reducing fluidity. Observers picked up emotion even without facial expression.

Children

4, 5 and 8 year old children watched videos of movement (as in the Adult trial) expressing joy, anger, fear and sadness. Again children scores above chance level. 4 year olds had the lowest scores, while 5 year olds achieved levels close to 8 year olds (and the adult's scores)

Emotion and Empathy.

Drawn from Wikipedia Psychology of Dance - Empathy mediates cognition in dance improvisation; through understanding others emotions and intentions dancers make affective motor decisions. Improvised movement is based on embodied cognition, the theory that the body reveals the nature of mind, motor cognition, that cognition is embodied in action, social cognition that knowing is inseparable from action. Mirror neurons underlie many movements, allowing dancers to subconsciously respond to stimuli from other dancers.

Summary

The volume of research into the impact of dance amongst populations - old and young - are generally positive, illustrating the ability for dance to elicit improvements in various elements of physiological and psychological wellbeing - regardless of age, ethnicity, form of dance and mobility.

There is still opportunity for comparative studies comparing the impact of difference dance styles on age and gender, but also comparing demographic variables, contrasting ethnic and geographical populations and the impact and context of music

Key findings

- **How to engage populations who have accepted "in theory" that lifestyle modification and activity is needed for wellbeing - yet take no action.**

Can Dance be the answer to encourage engagement? Research on hard to reach individuals eg adolescent girls and older people with chronic disease, lead us to the view that intrinsic motivation is key to adoption

- **“Dance more” is the key to mental acuity.**
Stemming the increase in degenerative conditions (Parkinson disease, Alzheimer’s) and supporting cognitive development in children and young people.
- **Projects and Performance enhance commitment and engagement - regardless of age. Performance enables the dancer to engage the inner self - so providing a holistic approach to wellbeing through the creative nature of dance**
- **“One size” (or dance style) does not fit all -tailoring experience and co-production should be explored further (rather than stereotyping based on past experience)**
- **Improving the health of nation is critical for economic vitality across the world.**
- **The “silver tsunami of over 60’s ” and the epidemic of T2 Diabetes in children and young adults are the most critical areas to be addressed.**
The young and the old are key priority areas for Dance action!

Finally can members of CID and UNESCO be a force for change and together become “Dance Champions” for Health and Wellbeing?

Author: Visiting Professor (Lady) Christine Bamford is Chair of Centre for Citizens Enterprise and Governance and independent Board member of the Institute of Health and Wellbeing, University of Northampton.

Christine also performs creative dance under her stage name Christina Carrera aka Aysis Dancer



Special Acknowledgement to :

Brigitte Piniewski MD Chief Medical Officer, Peace Laboratories, Portland, USA, for her generous sharing of research, articles and presentations [http//peacehealth.org](http://peacehealth.org).

Professor Carol Phillips. Institute of Health and Wellbeing, Professor Dr Olinga Taaed, Centre for Citizenship, Enterprise and Governance and Matt Gough Senior Lecturer in Dance - University of Northampton, UK

Professor Janet Lord, Director of the Centre for Healthy Ageing Research, University of Birmingham, UK and Julie Robinson, Move it or Lose it.

Professor Bim Bhowmick OBE

International Association of Margaret Morris Movement and Movement Therapy

- Special acknowledgement to Jan Houslander and Gail Borrowes. IAMMM -

Cara Bamford and Elena Carter for Y Generation views on Wellness

Hossam and Serena Ramsey, Shameena Dancers and Lynn Owen

Charles Eales - Microsoft Corporation and Corine Marsolier - Director, Cisco Healthcare and Life Sciences Division

References:

Links/Videos

IDF Diabetes Atlas (<http://www.diabetesatlas.org>)

OECD health data

CDC World Health Organisation, Milken Institute

You tube Dave Coplin Microsoft Chief Envisionist, "Future re-imagined"

<http://data.worldbank.org>

<http://www.oecd-library.org/economics/oecd-factbook-2014>

<http://census.gov/population>

[http://fastcoexist.com/3040827/world-changing-ideas/can treat](http://fastcoexist.com/3040827/world-changing-ideas/can-treat)

Research articles Bibliography

Dancing towards wellbeing in the Third Age - Trinity Laban Conservatoire of Music and Dance 2010 A comprehensive literature review commissioned by the London Thames Gateway Dance Partnership.

Belardinelli R, et al (2008) Waltz dancing in patients with Chronic Heart Failure; a new form of exercise training, *Circulation Heart Failure* (1) pp 107-114

Colins M & Raleigh SM (2009) Genetic risk factors for musculoskeletal soft tissue injuries. *Medicent and Sport Science* 54 136-149

Dayanim S (2009) The acute effects of a specialised movement programme on the verbal abilities of patients with late stage dementia - *Alzheimer's care today* 10 (2) pp 93-98

Eyigor S. Et al (2009) A randomised controlled trial of Turkish Folklore dance on the physical performance, balance, depression and quality of life in older women. *Archives of Gerontology and Geriatrics* (48) pp 84-88

Federici, A, Bellagamba S, & Rocchi M.B. (2005) Does dance based training improve balance in adult and young subjects? - a pilot randomised trial - Ageing Clinical and Experimental Research (17) pp 385-389

Hackney M.E., Kantorovich S, & Earhart G.M. (2007) A study on the effects of Argentine tango as a form of partnered dance for those with Parkinson disease and healthy elderly - American Journal of Dance Therapy, 29 (2) pp 109-127

Hackney, M.E. & Earhart G. M. (2010) Effects of dance on gait and balance in Parkinson's disease - a comparison of partnered and non partnered dance movement, Neurorehabilitation and Neural Repair 24 (4) pp 384-392

Jeon M.Y. & Choe. M.A> (1996) Effect of Korean traditional dance movement training on psychophysiological variable in Korean elderly women - Journal of the Korean Academy of Nursing 26 (4) 833-852

McKinley P et al (2008) Effect of a community based Argentine tango dance programme on functional balance and confidence in Older adults - Journal of Aging and Physical Activity (16) pp 435-453

Moura Silva Lima. M. & Pedreira Vieira A (2007) Ballroom Dance as Therapy for the Elderly in Brazil - American Journal of Dance Therapy 29 (2)

Ortega et al 2008 and Moore et al 2003, Kriemier et al 2010 - Health benefits in young people and impact of sedentary behaviour

Parkes J.H., Pryer M, Wray P and Taylor J (2014) Partners in Projects: preparing for public involvement in health and social care research. Health Policy 117 (3) 399-408 0168-8510

Powers R (2010) Use it or Lose it : Dancing makes you smarter, Stanford Dance socialdance.stanford.edu/syllabus/smarter.htm

E Quin (2007) Dance Science research report - increasing levels of physical activity with young people. Full report Trinity Laban NRG2 project, Dance for your Life (D4YL) Connolly et al 2009

Stanner, S, Thompson R & Buttriss J.L. ed (2009) Health ageing : the role of nutrition and lifestyle - report of British Nutrition Task Force, Wiley-Blackwell, UK

Vankova H et al (2008) Functional status and depressive symptoms among older adults from residential care facilities in the Czech Republic - International Journal of Geriatric Psychiatry 25 (5) pp 466-471