Accepted author manuscript version reprinted, by permission, from Journal of Aging and Physical Activity, 2022, https://doi.org/10.1123/japa.2021-0332

1	"I hear the	music and	my spirits	lift!"
---	-------------	-----------	------------	--------

2	Pleasure and ballroom dancing for community-dwelling older adults.
3	Sarah R. Chipperfield ¹ &Paul Bissell ²
4	¹ Department of Sport, Exercise and Rehabilitation Sciences, University of Hull, U.K.
5	² School of Human and Health Sciences, University of Huddersfield, U.K.
6	
7	Running head: Pleasure and ballroom dancing for older adults.
8	
9	Dr Sarah R. Chipperfield
10	Department of Sport, Health and Exercise Science,
11	University of Hull
12	Hull, HU6 7RX, UK
13	s.r.chipperfield@hull.ac.uk
14	+44 1482 462229
15	

¹ Research completed as part of Ph.D. studies at the University of Huddersfield. Employed by the Department of Sport, Exercise and Rehabilitation Sciences, The University of Hull.

Since submission for review, Paul Bissell is now employed by the University of Chester.

Abstract

Physical activity for older adults is recommended to encourage the maintenance of functional autonomy and improve mental health. Ballroom dancing involves aerobic, strength and balance work and is an inherently social activity. This 12-month qualitative study considered the influence of ballroom dancing on health and well-being in community-dwelling older adults. It explores an under-reported aspect of physical activity, which may incentivise older people to participate, that is, pleasure.

Qualitative data were managed and analysed using the Framework Analysis approach. Semi-structured interviews were conducted with 26 older-adult ballroom dancers. Five typologies of pleasure were identified. In addition to 'sensual pleasure', 'pleasure of habitual action' and 'pleasure of immersion', as suggested by Phoenix and Orr (2014), the 'pleasure of practice' and 'pleasure of community' were also identified. Ballroom dancing produces a strong sense of embodied pleasure for older adults and should be promoted by health and exercise professionals for community-dwelling older adults.

Keywords: Dancing, ageing, physical activity, well-being.

Introduction

1	,		
_	٠		
	_		

1

3 Although adults in the United Kingdom (U.K.) are living longer and are, in the 4 main, healthier and wealthier than previous generations, age is by far the biggest risk 5 factor for a wide range of clinical conditions, with musculoskeletal conditions being the 6 main cause of years lived with disability for older adults (Briggs et al., 2016; World 7 Health Organization (WHO), 2021). Approximately 65% of older adults aged 65-85 8 years live with at least two long-term health conditions (Barnett et al., 2012, cited by 9 Wolff et al., 2014), with musculoskeletal conditions commonly co-existing with mental 10 health conditions (Public Health England, 2019) 11 12 Given the gradual increase in the average age at which older adults are able to 13 retire and claim a state pension in the U.K., it is increasingly important that older adults 14 maintain a good level of health and functional autonomy to accommodate the extended 15 years in work (Dominiczak et al., 2014). Therefore, designing effective, multifaceted 16 health and well-being policies for an ageing population is a pressing concern. Due to 17 the rise of the ageing population over the last decade, worldwide health policy has 18 focused its priorities on the theme of 'healthy ageing' with the United Nations General 19 Assembly declaring 2021-2030 'The Decade of Healthy Ageing' (WHO, 2021). 20 Beswick et al. (2010) suggest 'healthy ageing' consists of the ability for individuals to 21 remain independent, demonstrate personal growth, good physical function, 22 psychological well-being and social involvement.

23

24

25

Additional ageing theories such as 'successful ageing', 'active ageing' (Larkin, 2013), 'ageing well' (The Lancet, 2012) 'productive healthy ageing' (Public Health

1 England, 2019) and 'resilient ageing' (Hicks and Conner, 2013) have been suggested.

2 Such concepts have focused on adaptations throughout the life-course and maintaining

good levels of emotional and cognitive health, personal growth, physical activity and

independence, autonomy and on reducing social isolation, age-related discrimination

and abuse (Beswick et al., 2010). Whilst these concepts aim to address the needs of

older adults, they have also been criticised for their political rhetoric; 'successful' and

'active' ageing may suggest ageing is a social and economic burden if not well

'managed', and indeed, will be unachievable for some (Larkin, 2013, p.153). However,

Beswick et al. (2010) suggest that successful ageing can still occur in those who have

significant dependence upon others if social engagement is strong. The concept of

successful or active ageing will depend upon how 'success' is defined and by whom,

and it is acknowledged the term can have negative connotations; that if 'successful'

ageing is not achieved, one is ageing *unsuccessfully*. It must be recognised that for

some, over-coming the inherent physical decline of the ageing body is hampered by

long-term health conditions, and a multitude of other socio-eco-demographic factors,

which may make 'successful' ageing near impossible.

17

18

19

20

21

22

23

24

25

3

4

5

6

7

8

9

10

11

12

13

14

15

16

Of course, it is not physical activity alone that can address population health. Whilst activities such as ballroom dancing are a social and relatively inexpensive physical activity to be involved in, requiring little in the way of expensive equipment or dress if participating at recreational level, to improve population health outcomes, wider issues need to be addressed for older adults. These include such complexities as suitable access to and provision of healthcare, appropriate housing and security of living; both financial and physical environments and socio-eco-demographic variables such as gender, marital status and asset ownership and, consequently, there is a need for

1 supporting policies and interventions from governments too (Cheung-Ming Chan and 2 Cao, 2015; Arazi et al., 2022). The literature indicates that social and cultural factors 3 have a considerable impact on one's ability to adhere to physical activities. Financial, 4 accessibility and environmental factors have previously been cited as perceived barriers 5 to physical activity (Flynn and Stewart, 2013) and these are barriers that might become 6 more prevalent for older adults, in addition to logistical factors such as committing 7 sufficient time for transportation to and involvement in activities (Azari et al., 2022). 8 Whilst a complex topic to examine, lower socioeconomic group status has also been 9 associated with lower levels of leisure time physical activity (Elhakeem et al, 2017). 10 Using the Index of Multiple Deprivation (IMD) measuring local deprivation, recent 11 findings suggest that 50% of those in the lowest quintile, the 'most deprived' group, met 12 aerobic activity guidelines, in comparison to 68% of those in the least deprived 13 socioeconomic group (Health and Social Care Information Centre (HSCIC), 2017). 14 15 The ageing process is commonly considered to involve negative changes to 16 physical health, such as a decline in function, mobility, muscle strength, vision, 17 vestibular, somatosensory and central nervous system changes and an increased risk of 18 falls, yet there are limited numbers of older adults participating in vigorous physical 19 activity to levels that have a preventative effect on such age related changes (Fernández-20 Argüelles et al., 2015; Flynn and Stewart, 2013; Gomes da Silva Borges et al., 2014). 21 Research suggests 13% of adults in the 65 to 74 age-group and 6% over the age of 75 22 participate in vigorous activity, with 35% of males and 45% of females aged over 75 23 being considered inactive (Flynn and Stewart, 2013 p.91). Therefore, whilst 24 acknowledging the complexities of improving population health, there remains a need

to encourage older adults to participate in physical activities that mirror current

- 1 guidelines for this age-group; these including activities that include aerobic,
- 2 strengthening, balance and co-ordination exercises to help reduce the risk of falls
- 3 (National Institute for Health and Care Excellence (NICE), 2013).

Ballroom Dancing, health and well-being

5 Social ballroom dancing is a physical activity that includes elements of aerobic, 6 balance and strengthening exercise (Blanksby and Reidy, 1988; Gomes da Silva Borges 7 et al., 2014; Verghese, 2006). It is an inherently social activity that can help build one's 8 confidence, skills and sense of worth (Cooper and Thomas, 2002). Although the 9 majority of ballroom dancing studies use small sample sizes for a period of around 2 to 10 3 months to assess for health and well-being changes, results have demonstrated that 11 even in very short duration studies, ballroom dancing appears to give rise to significant 12 changes in functional activity, gait measurements, balance outcome measures and 13 cognitive performance in clinical populations worldwide (Abreu and Hartley, 2013; 14 Belardinelli et al., 2008; Gomes da Silva Borges et al., 2014; Hackney and Earhart, 15 2009; Hackney et al., 2007; Hulbert et al., 2017; Kattenstroth et al., 2011; McKinley et 16 al., 2008; Rios Romenets et al., 2015; Verghese, 2006). In further short-term studies, 17 ballroom dancing has been suggested to show a moderate reduction in depression scores 18 and some positive subjective experiences such as enjoyment, social interaction and a 19 pleasure for learning being reported in questionnaire responses (Haboush et al., 2006) 20 and significant reductions in depression and improvements in quality of life and self-21 esteem measures (Pinniger et al., 2012).

22

23

24

4

Lima and Vieira (2007) studied the meanings of ballroom dancing and its health benefits in 60 people aged sixty years and over in Brazil. Ballroom dancing was said to be 'entertaining' and 'relaxing' (p.137) and participants felt happiness and an ability to

forget their problems and unpleasant experiences during classes; "everything turns into

3 beautiful moments" (p.138). The authors suggest the older adult dancers were able to

4 foreground their own bodies and modify the conventional role of older adults, "the body

may change from a source of oppression to a course of freedom" (p.140).

Koch et al. (2016) also considered the theme of the dancing body in their feasibility study of a tango intervention for adults with Parkinson's. While based upon only a single 90-minute intervention with 34 participants, findings suggested significant improvements in well-being, body self-efficacy and cognitive outcome expectancy. Additional measures demonstrated increases in happiness and elements such as those related to aesthetic experiences, emotional expression, unison with partner and joy and pleasure. Rodio and Holmes (2017) explored ballroom dancing for older adults in an assisted living facility and discovered it provided a sense of community and allowed individuals to reconnect, reminisce and actively engage in life. Similarly, Stevens-Ratchford (2016) interviewed and observed older adults who had been participating in long-standing ballroom dancing for over a decade, for 2-hour sessions, 3 times over a 4-week period. The dancers considered ballroom dancing to provide cognitive challenge and stimulation of their minds, motivation to develop their dancing skills despite its challenges and that dancing had become an important and pleasurable part of their lives over the years.

The results from the studies above provide positive findings that suggest ballroom dancing could enhance 'successful' ageing and emotional well-being in older adults since participation in ballroom dancing has been found to provide a sense of enjoyment, community and social inclusion across diverse cultures. However, much of

- 1 the dancing research has focused on older adults residing in assisted living
- 2 environments, or living with long-term neurological or cognitive pathologies, rather
- 3 than individuals who reside independently in their own homes who self-manage a
- 4 variety of long-term health conditions. Further, it has only been examined in short-term
- 5 or episodes of 'one-off' data collection, rather than longitudinal studies with more
- 6 'novice' dancers.

Pleasure and physical activity

The extent to which individuals are able to successfully age, is to some degree dependent on their investments and interests, which, in turn, are shaped by socio-ecodemographic factors such as one's social class, gender, race, lifestyle and educational and income levels (Arazi et al., 2022). Interests are forms of embodied pleasure and there has been increasing interest in how individuals gain 'pleasure' from their health-seeking behaviours. Pleasure is considered an important aspect of health promotion and advocated as a factor that should be incorporated into public health policies to improve adherence to exercise (Allain, 2020; Bennett et al., 2017; Crawford, 2006; Ekkekakis et al., 2011; Frazão et al, 2016; Mikkelsen, 2017; Phoenix and Orr, 2014). Although 'pleasure' has rarely been considered from the perspective of older adults, Phoenix and Orr (2014) suggest the pleasures of physical activity should be explored across the life course. Pleasure needs to become a focus of health promotion for older adults as it can foster interpersonal relationships and belonging (Bennett et al., 2017; Lindelöf et al., 2017).

'Pleasure' is defined as, "being the diverse emotions that make a person 'feel good', including, "happiness, joy, fun, sensuality, amusement, mirth, tranquillity"

- 1 (Smith, 1980, p.75, cited by Phoenix and Orr, 2014, p.96). Phoenix and Orr (2014)
- 2 identify 4 typologies of pleasure; sensual pleasures, documented pleasures, the pleasure
- 3 of habitual action and the pleasure of immersion. According to Phoenix and Orr (2014)
- 4 'sensual pleasures' encompass the sensory experiences of physical activities, such as the
- 5 sensations of touch, sounds and smells. 'Documented pleasures' relate to the
- 6 documentation of one's activities after the event in diaries, training logbooks or other
- 7 forms of written accounts. The 'pleasure of habitual action' relates to the habitual
- 8 involvement in physical activity and the pleasure, "evoked by the habit of doing the
- 9 activity", which provides an element of structure and purpose in life, particularly after
- 10 life-changing events such as retirement (p.98). The pleasure of immersion is noted to be
- 11 the pleasure derived from being able to "escape from and/or gain perspective on issues
- demanding attention" in one's everyday life (p.99). Cabrita et al. (2017, p.1) also
- suggest that, "pleasure is one determinant of intrinsic motivation" but is often forgotten
- when promoting physical activity for older adults and is "under-researched and under
- 15 theorised" in healthcare.

Research aim

16

17

community-dwelling older adults who participated in social ballroom dancing over a

This study aimed to explore the health and well-being experiences of

- 19 12-month period. 'Well-being' is a term often used in healthcare practice but there
- 20 remains some debate around the meaning of well-being and how it might be
- 21 conceptualised and measured (Hartwell, 2013). Whilst different health policies and
- disciplines might have contested perspectives on a definition of 'well-being', there
- remains broad assumptions that well-being is concerned with dimensions such as one's
- 24 life satisfaction, positive mental health, resilience, positive social relationships and

autonomy (Mansfield et al., 2020). These multidimensional factors were explored with the participants in this study with relation to their involvement with ballroom dancing.

The findings apply, add to and extend Phoenix and Orr's (2014) work on pleasure and physical activity with the presentation of an adapted typology model specific to the pleasures of ballroom dancing for community-dwelling older adults.

Methodology

This report focusses on the qualitative element of a longitudinal qualitative-dominant, concurrent mixed-methods study (Padgett, 2012), which was conducted over a 12-month period, to investigate the influence of social ballroom dancing on health and well-being for older adults. The quantitative element, which focused on the analysis of standardised clinical outcome measures for falls risk, balance and well-being, has previously been published (Chipperfield and Stephenson, 2022).

Doyle et al. (2009, p.178) discuss the paradigm of 'pragmatism' and advocate an 'eclectic' approach to the research process, whereby the merits of combining both qualitative and quantitative research paradigms in mixed method studies are utilised to optimise the ability to answer one's research questions. This further highlights that mixed methods are useful in healthcare research as they not only report on outcomes, but also the *context* of outcomes measured and because healthcare research presents, "complex and multi-faceted research problems" (Doyle et al., 2009, p.175) because 'health' is a complex and multifaceted phenomenon. John Dewey, in his early advocation of pragmatism notes, "neither inquiry nor the most abstractly formed set of symbols can escape from the cultural matrix in which they live, move and have their

- being" (1938, p.20 cited by Corbin and Strauss, 2008, p.3). Following the position of
- 2 Dewey's paradigm of pragmatism, with its emphasis on lived experiences (Morgan,
- 3 2014); participants' beliefs and actions were considered in the process of a pragmatic
- 4 approach to the qualitative inquiry in this research study. The qualitative methodology

5 will be outlined below.

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

Participants

The aim was to recruit a purposive sample of 25-30 participants. Creswell (2007) suggests using 20-30 participants in qualitative inquiry to develop theoretical saturation. Participants were community-dwelling older adults who participated in social ballroom dancing. Inclusion criteria were minimised, recognising that many older adults live with various long-term health conditions. Therefore, inclusion was based on considerations of age group (>55 years-old with no upper defined age limit), community dwelling status (lived alone or with a partner in their own homes) and social ballroom dancing requirements (dancing for at least 1-hour per week, and novice/noncompetitive dancer level) and the suitability of the outcome measures chosen to assess for physical function (as reported in Name Withheld and Name Withheld, 2020). Prior to recruitment, it was recognised that dancing classes were an activity that participants often started as a new activity shortly after retirement, at around the age of 60, but at times partners were slightly younger (hence the >55 age group). Participants with diagnosed dementia-related pathology were not the focus of this study as there has been previous research into dementia and ballroom dancing (for example, Rösler et al., 2002; Verghese et al., 2003). Thus, to avoid duplication and some of the practical 'challenges' a prospective study may present for those living with dementia (Samsi and Manthorpe,

- 1 2020), such as changes in communication and language production, word-finding
- 2 difficulties, limited concentration spans and possible distress or agitation arising from
- 3 symptoms, people with dementia were excluded.

Qualitative approach

Participants' well-being experiences, motivations, meanings and realities were gathered via semi-structured interviews. An interview guide was used to address specific research questions. This focused on the reasons why older adults engage in and adhere to social ballroom dancing as a physical activity and the relationship between ballroom dancing and their health and well-being. This was modified following each round of interviews, having considered the findings from the preceding interviews.

Participants were interviewed by the lead author on-site at the local university campus, either as individuals, if they attended their dance classes alone; or as a pair if they attended with a dance or life partner. This assisted with consideration of the interactions and dynamics of a dance partnership. Participants were interviewed three times during the course of the 12-month study; initially at baseline, after 6 months and at 12-months. Baseline interviews considered influence of dancing on their health and well-being, what were the participants' initial motivations to dance and explored their dance experiences across the life course. Subsequent interviews at 6 and 12 months considered how the experience of involvement in ballroom dancing influenced one's health and well-being over a 12-month period, progression in dancing, adherence and the motivations of participants to continue, or reasons for cessation. Interviews were recorded using a digital voice recorder and transcribed verbatim.

The lead author had a personal history of social ballroom dancing and it was recognised and acknowledged that this position might have had a potential impact on the interpretation of findings via an 'insider' status. Lincoln (2010, p.7 cited by Smith et al., 2012) argues that pragmatists not considering epistemological and ontological issues are 'naïve and fraudulent' and that it is important for researchers to consider their standpoint, their relationship to others and what constitutes knowledge.

Derived from Thematic Analysis, a Framework Analysis (FA) approach was settled upon as it provided a pragmatic, thematic method to collect and analyse the qualitative data (Ritchie and Spencer, 1994). FA is a well-known approach in health-care research and was considered suitable for use when analysing semi-structured interview data that has been collected to answer specific research questions, *a priori* issues that need addressing and when the research has more limited timescales (Gale et al., 2013; Ritchie and Spencer, 1994; Srivastava and Thomson, 2009). It depends, somewhat, on how the research questions are posed as to whether an inductive or deductive approach is taken in FA, but *how* questions, such as those posed during the interviews in this study as to *how* ballroom dancing influences one's health and well-being, took a more inductive approach as the themes were generated through coding of the data and Gale et al. (2013, p.3) note "this allows for the unexpected and permits more socially-located responses".

The 5-stage process advocated for FA to structure the analysis of qualitative data was employed in this study due to its pragmatic approach and for the provision of a comprehensive audit trail. The stages are: Familiarisation with the data, whereby the interview recordings are listened to again and transcripts read through in full to 'take

stock' of the data; Identifying a thematic framework, the recognition of recurrent themes; Indexing, for which a structured approach as suggested by Gale et al. (2013) was used, similar to that of Grounded Theory with 'line by line', 'open' and 'focussed' coding stages used (Charmaz, 2014; Strauss and Corbin, 1998); Charting of emergent codes and themes using Microsoft Excel® as a data organisation and management programme. Finally, the Mapping and Interpretation stage is a reflexive process of immersion in the data to consider reasons and provide explanations for the emergence of given phenomena or people's attitudes, experiences and behaviours towards social ballroom dancing. Charts were reviewed, the key themes and background literature were considered to help address the research questions and comparisons and contrasts made with the findings from this study (Ritchie and Spencer, 1994; Srivastava and Thomson, 2009; Ward et al., 2013).

During the process of indexing and coding, a sample of the interviews were considered by one of the research supervisors as a 'critical friend', thus encouraging reflexivity of the data. The open codes were discussed and as a result one of the titles of the key themes was amended. Whilst not performed as a means of demonstrating 'reliability' in the qualitative data, for there are arguments that reliability is inappropriate in qualitative research (Smith and McGannon, 2018, p.113), this process of peer review and discussion can assist with challenging each other's construction of knowledge, thereby increasing the rigour of the analysis (Creswell, 2007; Smith and McGannon, 2018). Codes were identified from each set of participant interviews and sent as a Microsoft Word® document to each participant via email or post for comment. The worth of 'member checking' is suggested by some as a process designed to enhance validation and rigour in qualitative research (Creswell, 2007 p.46) yet it has since been

1 contested by others as an ineffective process due to its problematic epistemology and 2 ontology (Smith and McGannon, 2018). Whilst is recognised that 'member checking' 3 has theoretical flaws, publication 'checklist' guidelines continue to ask whether 4 transcripts and/or themes have been 'returned to participants for comment and/ or 5 correction', with the widely cited 'consolidated criteria for reporting qualitative 6 research' (COREO) criteria used (Tong et al., 2007, p352). The authors prefer to 7 consider, in agreement with Smith and McGannon (2018, p.104), that the process of 8 returning codes and themes allowed for 'member reflections'; for neither the researcher 9 nor participant are truly able to 'step outside of' their own experiences. In this instance, 10 the participants were given opportunity for open dialogue on whether the themes 11 derived from the transcripts were an accurate representation of the interviews. 12 Participants said that no misrepresentations of their meanings had occurred during the 13 coding process, although, again, this process cannot be used as a claim for 'validation' 14 since the agreement might be influenced by a participant's comprehension or

Ethical considerations

Smith and McGannon, 2018, p.107)

15

16

17

18

19

20

21

22

Prior to recruitment, ethical approval was sought and gained from the University of Hudderfield's Research Ethics Panel to ensure adherence with ethical codes of practice for inclusion of human subjects. Right to withdraw, confidentiality and anonymity, storage of data and a risk analysis were considered and written informed consent was given by all participants.

inadvertent power dynamics at play between the researcher and participant (please see

Research Findings

2	A purposive sample of 26 older adults were recruited to the study. The
3	participants' ages at baseline ranged from 58 to 83 years, with a mean age of 66.7 years
4	(Standard Deviation (SD)=5.85). Fifty-four percent (<i>n</i> =14) were female and 46%
5	(n=12) were male. All participants were recruited face-to-face via one local dance class
6	leader contact and met the inclusion criteria. Of the 26 participants at baseline, 23
7	(88%) had pre-existing long-term medical conditions for which they took regular
8	medication. The various conditions included different types of arthritis, osteoporosis,
9	Coronary Heart Disease, hypertension, hyperthyroidism and visual pathologies. No
10	participants were identified as having a dementia-related pathology.
11	Participants were recruited from newly formed dance classes, and interviewed as
12	soon as possible upon recruitment this usually being within several weeks of their
13	attendance at the dance class. Some of the participants had previously attended ballroom
14	dancing classes at a recreational level in their late teens and twenties several decades
15	earlier, but reported they had stopped once they married, had families and work and
16	home life dominated. One participant had been involved in ballroom dancing
17	competitions 5 decades earlier.
18	Twenty-three participants (88%; 13 females, 10 males, mean age 66.5 years
19	(SD=5.96)) completed the study and attended all 3 interview sessions over the 12-
20	month period, with the interviews at baseline, 6 and 12 months. Following the
21	interviews that occurred at the 3 stages of data collection, the questions regarding the
22	influence of ballroom dancing on one's health and well-being, one's reasons for
23	attending ballroom dancing classes and subsequent adherence appeared to have reached
24	a point of saturation whereby a comprehensive understanding was provided by
25	participants, with no new codes emerging. Three participants (2 male, 1 female;

- 1 participant numbers 16, 17 and 20) withdrew from the study after the baseline data
- 2 collection session and before the 3-month meeting as they had decided to cease
- 3 ballroom dancing classes before the 3-month data collection point and hence, no longer
- 4 met the inclusion criteria. Twenty of the 23 participants (88%) who completed the study
- 5 lived with long-term conditions for which they took medication.
- 6 In total 41 interviews were performed with individuals or dancing couples.
- 7 Interview lengths ranged from 9 minutes and 53 seconds to 69 minutes and 48 seconds.
- 8 The baseline round of interviews tended to be the longest length for each set of
- 9 participants, with the third round the shortest (as was the case for the shorter length
- interview noted above), reflecting a saturation of the themes discussed by 12-months.
- 11 To assist with interpretation of the findings, the demographic characteristics, participant
- pseudonyms and interview status are summarised in Table 1 below.
- 13 Table 1 Participant Demographics and Pseudonyms

15

16

17

- Of note, the dyad of Florence and Isabel was two widowed friends who danced together, travelled to the data collection sessions together and hence wished to be interviewed together. All other dyads consisted of life partner couples. Participants 5,
- 18 10, 13 and 20 were interviewed as single participants.

- 20 Participants' addresses were recorded to allow for ease of correspondence for arranging
- 21 data collection appointments. This included the recording of postcodes, which allowed
- 22 for socioeconomic groups to be categorised using participants' postcodes according to
- 23 the Index of Multiple Deprivation (IMD) data in Table 2 below (National Perinatal
- 24 Epidemiology Unit (NPEU), n.d.). The IMD social group quintiles were not an atypical
- 25 spread of scores, with groups 2 to 4 evenly represented and the higher and lower

- 1 quintiles including lower number of participants, as might be expected. This
- 2 demonstrated that social ballroom dancing was enjoyed as an activity across social
- 3 groups.

Table 2 Categorisation of socioeconomic groups by Index of Multiple Deprivation
 scores

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

Pleasure and ballroom dancing

The over-riding theme that emerged during interviews was that of the 'pleasure' that ballroom dancing provided for dancers; not only the act of dancing itself, in terms of aspects such as the aesthetics, the sense of freedom of movement and self-expression, but the sociality of the dance with one's partner and within the group. This aligns with the work of Phoenix and Orr (2014) and their qualitative study on pleasure and physical activity amongst older adults. With the exception of 'documented pleasures'; as none of the participants in this study mentioned participating in this form of pleasure, the other three types of pleasure as suggested by Phoenix and Orr (2014) namely, 'sensual', 'habitual action' and 'immersion' emerged from the data as evident within this sample population of older adult ballroom dancers, thus demonstrating theoretical generalisability between the research. However, the current research highlights that there is more complexity to the types of pleasure associated with physical activity. Whilst applying some of the types of pleasure of physical activity, as suggested by Phoenix and Orr (2014), this study specifically applies and gives examples of these pleasures in ballroom dancing and proposes two further types based upon the prominent themes that emerged from the findings; the 'pleasure of practice' and 'pleasure of

1 community'. These five types of pleasure will be presented in relation to community-

2 dwelling older adults who participate in ballroom dancing.

Figure 1 below represents a new model of the 5 typologies of pleasure of

ballroom dancing for older adults that emerged from the data in this study.

Figure 1: The Pleasures of Ballroom Dancing for Older Adults

Ballroom Dancing and Sensual Pleasures

The sense of sound was stimulated by hearing music to accompany ballroom dancing and was often highlighted by participants as being an important aspect of the pleasure of engaging in ballroom dancing. It provided a sense of reminiscence for individuals; the music being of an era to enable 'rekindling' their youth and earlier dance experiences. Vitti, Moore, Dalton and O'Neil (2018) also note the importance of self-selected music to enhance a pleasurable experience during intense physical activity. As Isabel suggested, she would not go to exercise classes where there was no music, "If there wasn't the music it wouldn't be the same". Kathleen considered there to be a combination of senses involved in her pleasure; those of movement and body awareness (a sense of proprioception) *and* the audible music that provided her with sensual pleasure. Similarly, Isabel noted, "You can move to the music and you *feel*... that's how I feel anyway, there's a rhythm to it".

Touch is an important sense used during the experience of ballroom dancing. The touch of a partner, the lead, constantly engages the follower and indicates the direction of movement or the next steps to be performed in a routine and one cannot successfully dance ballroom without attention to a partner's touch. This physical

experience with his partner Elsie, they were together as a couple, "you've got *contact* with somebody" as there was a sense of awareness of each other. In ballroom dancing an acute awareness of a partner's touch is an important aspect of leading and following in dances as Les highlights, "My partner knows what I am going to do because me [sic] body tells them". Isabel described the proprioceptive sensual pleasure of the bodily awareness of 'floating' around the dance floor providing pleasure when dancing with Les. The pleasure of following the touch of a partner, thus enabling dancers to dance provided a sense of instant gratification.

The notion of sensual pleasure can be extended to involvement of the sensory/perceptual system of proprioception, which is responsible for the sense of muscular position and movement (Toates, 2011). Participants discussed their muscles 'not being used to' performing certain movements but that as they progressed they realised the adaptations were 'doing some good', thus the reported sense of improvement in posture, balance, joint position and body awareness via the sensory proprioceptive system provided a sense of pleasure.

Not only was touch important in terms of the contact with a partner and the enabling of the dance, but it also provided a psychological support when individuals lacked confidence in their physical abilities. Kathleen highlighted this when referring to her anxieties about falling, having previously sustained physical injuries resulting from a fall. "When you're dancing, you've got a partner to hold on to" she noted. This sense of touch provided a supportive role, a sense of safety, security and confidence whereas walking outside alone, "I'm always aware of it". Similarly, Brenda and Robert had

observed the supportive touch of others *enabling* a frailer individual in a partnership,

2 "they support each other you know, husband and wife... they so enjoy it!" when

discussing how they had seen touch contributing to others' enjoyment of the dance.

However, several participants discussed the intimate nature of touch in ballroom dancing and how there was discomfort with touching anyone other than their life partner or regular ballroom partner in such a manner. Sheila had suggested, "You don't want to be as intimate with somebody else" and as Robert reiterated "so it proves to me we go with our partners to dance".

In addition to the sensations of touch and sound in ballroom dancing, many participants spoke of the visual aesthetics of ballroom dancing; suggesting that the sense of sight and of visual stimulation also provided participants considerable pleasure. This was evident in two ways; both as *participants seeing* and *the gaze of others*. Some couples, such as Brenda and Ronnie, were inspired to begin ballroom dancing by the sight of watching others dance whilst they were on holiday over many years.

Participants who had attended social dance events at such venues as the Blackpool Tower Ballroom marvelled at the sight; the beauty of the building itself, the ballroom floor, the costume, dress and make-up of dancers. It was considered and highlight of one's dancing experience and "mind-blowing" by Patrick. Eric's summary of the experience discussed the elaborate styles when dressing for the dance occasion and "it's, er, a sight!".

Once some of the couples improved their skill levels and confidence and felt capable of dancing in front of others at social dance events, they used the opportunity to

- 1 be seen to dance in front of others. As Claire had highlighted "this was one of the points
- 2 of doing it, was to go to Blackpool and sort of show off a bit, you know, to actually do it
- 3 in front of everybody else". Perhaps this might also indicate the possibility of a
- 4 'pleasure of performance' and this might be a provisional theme to further explore in
- 5 more experienced older adult ballroom dancers. There is no doubt that those even
- 6 observing others dancing at such events gained pleasure from watching others perform,
- 7 as Claire had recalled when the audience were watching her and her partner Isaac dance
- 8 and her sense of pleasure when they had been given a round of applause at the end of
- 9 their routine. Although for some participants, the gaze of others was a more
- disconcerting experience causing participants such as Richard and Jeane, to shy away
- 11 from participation for fear of embarrassing themselves.
- 12 Ballroom Dancing and the Pleasure of Habitual Action

14

15

16

17

18

19

20

21

22

23

24

Many of the participants in this study had very recently retired and one of their first concerns was to find a new structure and purpose for their lives, new activities and new social avenues. For Pamela, her alarm clock post-retirement was set as it was for work, but now her week's 'work' consisted of numerous forms of physical activity "so in that way, it is self-motivation, but I do treat it like work, which helps and it's a socialising side of it as well". Les spoke of the importance of ballroom dancing as being something he had to "get up and go to, be there at a certain time". Julie also highlighted her life was not now "governed by clocks" in terms of work commitments, leaving time for dancing to become "part of our routine of life now really. I wouldn't think of not going". For some participants, their lives were organised around dancing, including going on dance holidays, attending social dance events or avoiding clashes such as visitors coming or having to care for grandchildren on the days of their dancing classes.

Their pleasure from ballroom dancing has now grown and needed to be balanced and organised around their day-to-day lives.

This group of dancing participants persevered despite set-backs, particularly associated with their or their partner's physical health. This was evident for participants such as Jeane and Robert. Jeane's husband Alan had said to her during the interviews, "You do actually make an effort, don't you?" in reference to her overcoming several ailments to participate in the weekly dancing classes. Similarly, Robert and his wife Brenda also participated in spite of their physical limitations. They had been inspired by watching others dance, who they considered to be older and more disabled than they were, and were of the mentality, 'if they can do it, so can we'.

Les also discussed the need to improve his health following a cardiac event. "It took me a while to realise I ought to, I thought I can manage without, then I thought oh come on, you're Michelin man!". He 'realised he ought to' fulfil his bodily potential and ballroom dancing became his form of habitual pleasure to enable this. In Les' case, he returned to a physical activity that had provided him much pleasure in his youth.

Kathleen's environmental concerns related to access to the dance classes, she would only attend if she was familiar with the driving route, if it was very local and if there was a safe place to park her car, otherwise she would not go. When considering her reasons for maintaining this habitual action of ballroom dancing, Kathleen noted:

Before I go, I think of, you know, I don't want to go. I turn out and then as soon as I am there, I change and I feel better amongst people and I really enjoy it and I come away feeling a lot better, feeling more, younger.

Kathleen demonstrated a relationship here between her social and physical environments; she was in the company of familiar people, at a safe venue she knew. Kathleen's biological needs are addressed as she began to feel better; and her body demonstrated its potential as she began to feel younger. The mind 'feeling better' and body's sense of 'feeling younger' indicated an enhanced well-being and sensual pleasure through the habitual pleasure of ballroom dancing.

Ballroom Dancing and the Pleasure of Immersion

The sense of enjoyment and pleasure that participants discussed related to their ability to 'forget everything' when ballroom dancing and this was a prominent aspect of the meaning of ballroom dancing for them. Sheila discussed how dancing had helped her cope during the period when her mother was dying by escaping from the oppressive atmosphere of the hospital visits. Kathleen felt she was able to manage her constant anxiety regarding family troubles by dancing "I just forget everything and then, and just enjoy it". Phoenix and Orr (2014) discuss how detaching from one's daily concerns and/or people involved attachment to another place and this appeared to be the case for Kathleen's attachment to her ballroom classes, it was her *therapeutic landscape* (Hoyez, 2007, cited by Phoenix and Orr, 2014).

Whilst the ageing body might constrain or limit pleasures for some due to physical changes, several participants discussed how, when 'in the moment' of the

dance, they forgot their aches, pains and ailments because the pain was over-ridden by

the sense of pleasure of the act of dancing. Immersion enabled such transformation that

their aches and pains were forgotten when in the moment of the dance, as demonstrated

4 by Florence who 'forgot' about her back pain when dancing "I could be sitting at home

doing nothing, being miserable or going out and as I say, once you start, you forget

about it". Les had also noted the dancing took his thoughts away from his knee pain, for

7 some individuals dancing provided a transient distraction from their day to day selves.

Concentrating on the steps, the routines, the attention being paid to one's partner gave

Les "something totally different to think about".

Ballroom Dancing and the Pleasure of Practice

There was a consensus amongst participants that pleasure was gained through the practice of ballroom dancing. The participants' involvement in ballroom dancing as a regular form of physical activity provided a sense of physical competence. Kathleen had stated she was "not just an old lady sitting in a chair doing nothing". However, the competence not only took on physical forms, whilst Kathleen was physically active, she was also learning a new skill, she was involved in a society and, as did her fellow dancers, she gained considerable pleasure from this. Les had stated that in spite of his health limitations, ballroom dancing was, "Something I *can* do!".

There was also recognition that there had been improvements in their dancing skills, and this was particularly evident when new members started the group, as Isabel suggested, "we see newcomers and think gosh! We must have been like that when we started". This was not so much a negative reflection of the *lack* of skill demonstrated by novice members, but a recognition that even if they do not think that dances are going

1 particularly well, they have in fact learnt a considerable amount since starting the

classes, "and we've learnt how to do it properly" Isabel expressed.

4 The element of a new challenge was also discussed and typified by Irene's comment:

I mean one of my daughters said it's great because I joined a choir a couple of years ago as well and er she came to see me and she said, 'you know it's great that you started a challenge at your age' and it's the same thing isn't it dancing? A challenge.

Irene's daughter's comment here 'at your age' although encouraging, also demonstrates the social expectations of ageing in a more negative manner, that an age-related decline in health is inevitable (Wolff et al., 2014) and that it is unusual or unexpected for people to begin to learn new skills in older age. As an alternative view, Roberson and Pelclova (2013) liken the social dance environment to a "playground where there is music, people, dancing and fun" (p.5).

This accumulation of new dancing skills appeared to motivate participants to practice and develop their skills further. Cooper and Thomas (2002, p.690) also discussed finding that social dancing experiences (largely ballroom or sequence dancing, but not exclusively) provided older adults with a "sense of worth and achievement" when other skills had diminished. Most of the participants noted they started ballroom dancing classes with fairly low expectations of performance, they just wanted to be able to partake in dances, perhaps if on holiday, without embarrassing themselves too much. However, over the course of the study as the participants' skills

- developed, they increased their sense of competence-motivation. The more competent
- 2 they felt, the more they wanted to further their skills. This led participants to comparing
- 3 themselves to 'newcomers' or 'beginners' indicating they felt they had moved on from
- 4 that position.

- Ballroom Dancing and the Pleasure of Community
- 6 The majority of participants in this study began dancing classes post-retirement 7 with their life partners as it was seen as an activity they could do and enjoy together as a 8 couple. This was their primary reason for ballroom dancing. "A partner you can go 9 together with is a special thing for us because there's so many ladies who go and they 10 haven't got anybody to dance with and I feel really sorry for them" noted Irene. 11 However, in addition to finding activities they could do together, they sought new social 12 circles following the loss of work-life companions. This was perhaps important more so 13 for those participants who were single or had experienced the loss of a partner. Cabrita 14 et al. (2017) found that physical activity with a social companion resulted in a modest 15 increase of 6% more pleasure than activities performed alone. Haboush et al. (2006) 16 also suggest that the physical contact with another provides a sense of a more personal 17 experience and involvement in ballroom dancing as an activity. Pamela for example 18 finding her enjoyment of dancing was less when she did not have a regular partner to 19 dance with and sometimes had to 'sit out' dances or dance with beginners. She found 20 that at times she would take on a peer support role if she herself did not have a partner, 21 "Whilst I might not be dancing and getting enjoyment for myself, at least I'm helping 22 Emma teach someone else". Other couples such as Brenda and Robert attended the 23 dance events noting they were limited by their physical health conditions, "We don't do 24 much dancing but the social aspect of it is lovely".

The new sense of community provided participants with a great sense of pleasure. Pamela had even described it as a "second home". Participants would meet in the social space area prior to the classes to talk and for refreshments after their dancing classes, noting even if their dance teacher was not there to provide refreshments, they would meet anyway. The café area was *their* social space.

However, outside of the dance halls, as noted by Skinner (2010), and in this study, dancing in public is also something (or somewhere) when participants lack confidence. This demonstrating that in private dance spaces, some become other; gaining confidence, losing inhibitions, but in a public space, one's self is more reserved and nervous, because perhaps, for some people, their dancing passions are still the subject of ridicule from friends. Participants such as Richard and Jeane, whilst happy to dance within their enclosed private dance-group space, did not wish to participate in public dances. Jeane indicated she did not want to attend the social dances at the local town halls and Richard, much to his partner Rachel's annoyance, did not wish to dance at the prestigious Blackpool Ballroom, both for fear of embarrassing themselves. The above provides examples of the importance of the dancing space in providing a sense of community, feeling 'at home' and safe in the environment.

Discussion

The qualitative findings from this study apply, add to and extend Phoenix and Orr's (2014) typologies of pleasure and physical activity, specifically to ballroom dancing. The findings established the theme of a strong sense of pleasure derived from the practice of ballroom dancing, from which a new model of the pleasures of ballroom

dancing was identified. Pleasure in ballroom dancing was considered to be expressed

through 5 elements: sensual pleasure, the pleasure of habitual action, the pleasure of

3 immersion, as suggested by Phoenix and Orr (2014), and two new typologies derived

from the findings to extend the model; the pleasure of practice and the pleasure of

5 community.

Whilst previous research studies may have discussed similar findings for the reasons why people engage in physical activity, such as enjoyment and learning new skills, these have not been framed using the language of 'pleasure', nor particularly focussing on older adults, whereas this study does. It was a consistent finding in this study that such factors were experienced as pleasure by these older adult ballroom dancers. In addition, it is in contrast to findings such as those from Stenner et al. (2020) who found that reasons why older adults play golf differed between females and males. In their study, social contact was deemed more important to females whereas 'achievement' was more important to males. In this study, social contact and achievement were consistently reported as important by both female and male participants, adding weight to the argument ballroom dancing can provide pleasure for all.

The sensory systems of touch, proprioception, visual and auditory stimulation, either alone or in combination elicited by the practice of ballroom dancing can provide an avenue for pleasure for older adults. The experience of a combination of such sensual pleasures can also assist with individuals connecting their "body to the world" and, "connecting with one's environment" (Phoenix and Orr, 2014, p.97). As Phoenix and Orr (2014) note, sensory pleasure could extend past the present moment in which the activity occurred. The sensations produced in muscles could remain after the event, for

example, the feelings of stretching or mobility improvements in joints; the 'doing good' and the 'getting used to' sensations individuals felt.

The body's sensual experiences also appear to form an inter-relationship with their environment, as evidenced by the visual pleasure gained from watching dancers or being watched, the aesthetics of the dance, the nature of the dance floor or the dance space. Dressing up to dance was a way for older adults to resist societal pressures to 'grow old gracefully', avoid flamboyant dress and adhere to "age-appropriate actions and appearance" (Barry and Yuill, 2016, p.191). It is suggested these visual pleasures were part of older adults' personal resistance to ageing and society's expectations for older people to 'disengage' from society (Cumming and Henry, 1961 cited by Barry and Yuill, 2016, p.192).

In Phoenix and Orr's (2014) work with physically active older adults, their various physical activity regimes had become a routine. Similarly, ballroom dancing had become part of a routine for the majority of participants in this study; a 'habitual action'. Phoenix and Orr (2014, p.98) cite the work of Shilling (2008) suggesting that:

"Habitual action is associated with a balance in the relationship between

one's social and physical environment, biological need and bodily

potentialities. It involves embodied subjects realizing routinized [sic] modes

of behaviour that in turn, might connect them to, and facilitate the

management of their surroundings and their bodies."

An example of such a relationship was participants continuing the 'habitual action' of attending dance classes to realise body potentialities, even when the physical

environment was less than appealing. Classes late at night when it was dark and cold outside did impact upon one's motivation, with Sheila noting, "We sort of push ourselves to go" but that, "you feel good afterwards". Crawford's (2006) work on 'healthism' is relevant here; that is, health is not achieved by instant gratification or consumption practices in the moment, and that to achieve health, individuals must accept a positive benefit of 'pushing' themselves to give up consumption and pleasure in the moment. Ballroom dancing is not an activity that provides an instant gratification in terms of providing a sense of achievement. Dances consist of steps, turns and routines that take time to master and participants need to 'stay the course' and maintain interest for at least months, if not years, to achieve their longer-term goals. Indeed, Jallinoja et al. (2010, p.124) concur in their study of middle-aged adult women that, "descriptions of immediate psychosomatic pleasures related to physical activity were sparse", noting that pleasure was largely to be experienced after physical activity, because it is associated with temporal patterns of health and well-being. The participants who persevered with dancing in this study certainly did so driven by a passion for the aim for their long-term goals.

Cather has previously described dance "as almost a type of narcotic for young women" (1918, p.197 cited by Jensen, 2001, p.13). It is argued from the findings of this study and papers such as Thomas and Cooper's (2002) study, that ballroom dancing could be 'a type of narcotic' for some older women and men too, as evidenced by Kathleen who exclaimed she would dance all the time if possible, and took every opportunity to attend dancing activities. As did Julie, who, with her husband Ronnie, were one couple who had increased their hours dancing as the study progressed. Julie suggested they would not think of not going dancing now, it *had* become almost an

addiction for some, they were fully immersed in the physical activity and being a dancer had become a significant part of their everyday practices and identity.

Skinner's (2010) work with salsa dancers refers to examples of dancers joining a crowded dance floor, of diverse, sometimes anonymous bodies, allowing individuals to escape the 'drudgery' of daily life (Skinner, 2010, p.7). There are similarities in this study, with participants such as Kathleen and Les, who both lived alone, whereby dancing provided an escape from their isolated routines. Becoming immersed in the moment of the dance, participants such as Florence and Jeane, 'forgot' their physical pains and Kathleen was distracted from her family worries. This again demonstrates that there are various factors at play in one's experience of pleasure.

Reference can be made to Maslow's well-known 'hierarchy of needs' with respect to the need for a sense of community (Maslow, 1954 cited by Green et al., 2015, p.217). The mid-tier, 'belongingness and love needs', the level above basic physiological and safety needs, is a psychological human need to form relationships, make friends and be part of a group. It has been well documented that activities that involve social contact lead to greater well-being and positive emotions (Cabrita et al., 2017) and that those who enjoy greater social support are more likely to participate in physical activities (Trost et al., 2002). Later life friendship and camaraderie were also seen to be an important aspect of pleasure for older adult male Ice Hockey players in Allain's (2020) study. What was interesting to see in this study, was the sense of pleasure and camaraderie amongst the males of the group who, if with a female partner, had often been 'cajoled' into attending dance classes. By the end of the 12-month study, they told their stories of finding pleasure in an activity they were once not so sure about attending.

Dancers in this study suggested that when dancing, they 'become other'; the transferring of the self and the body to a new space creates 'other'. For some, the dance space creates another home from home and helps to provide new confidences and consciousness integrating dancers into a new community space. The dancing space becomes one's home, which Skinner describes as one's 'communitas' (2010, p.14). Whitworth (1995, p.209 cited by Thomas and Cooper, 2002, p.74) suggests "a community spirit is developed by the dancers having the common aim of performing a given sequence correctly". The findings of this study would appear to agree with Skinner's (2010) observation of salsa dancers; there was a definite sense of 'communitas', a new egalitarian community space forming not only in terms of the people but the physical space open to all. Physical activity can foster pleasure via interpersonal relationships and providing a sense of belonging for older adults (Bennett et al., 2017); this pleasure being evident within this community of older adult dancing participants.

Mikkelsen relates instances of 'becoming other' through pleasurable activities to Maslow's (1954 cited by Mikkelsen, 2017) concept of *self-actualization*, the highest-level self-fulfilment 'need', whereby individuals have an inherent desire to "become everything that one is capable of becoming" (p.93). As Kathleen's 'education' (skill level) increased, so did her sense of pleasure and sense of 'becoming other'; the feeling of renewal and 'turning back the clock' that ballroom dancing provided for her and for her fellow dancers. The dance provided the sense of being *able* when their day to day lives were troubled by being *un*able due to physical ailments and, for some, early cognitive decline. The participants were gaining new confidence and skills, feelings of

1 accomplishment ('esteem needs' being the second highest level of need according to

Maslow (1954 cited by Green, Tones, Cross and Woodall, 2015, p.217)), satisfaction

and greater motivation as they danced.

Participants very much valued the confidence gained from learning a new skill during their older adult years, a period of the life course where societal influences often cause older adults to become invisible. Wainwright and Turner (2006, p.243), suggest there is an, "inevitable decline of physical capital in the ageing body", particularly so in dancers. Les had talked of his frustrations about his body not doing what he wanted it to be anymore, yet he retained his "muscle memory" of being able to remember dance sequences learnt long ago (Wainwright and Turner, 2006, p.247). However, he had taken on a new role as a dance mentor, assisting the dance teacher in some of the local groups he attended; as Abel (2007, p.52) notes "perceptions, skills and knowledge can be understood as cultural resources that are virtually stored inside the individual human body". Les was able to use his "lifelong process of capital acquisition" (Abel, 2007, p.52) in this instance, his embodied knowledge as a dancer.

Pleasure is linked to one's desire to engage in a physical activity (Lenneis and Pfister, 2017) and in addition to considering the many factors associated with physical activity uptake and adherence, previous research has called upon health policy makers to promote the pleasures of physical activity to encourage people to become active (Bennett et al., 2017; Mikkelsen, 2017; Phoenix and Orr, 2014).

The enjoyment gained from the social aspect of the dance and the pleasure

- of community that it provided appeared to be the strongest motivation to dance. Whilst
- 2 there may be more intense forms of physical activity for older adults, Downward and
- 3 Dawson (2016) highlight that this can be associated with a lower sense of pleasure from
- 4 the activity and argue the importance of fun, social and recreational aspects of lower
- 5 intensity active leisure to achieve well-being

Conclusion

6

7 This study adds two new typologies of pleasure to the body of knowledge on 8 pleasure and physical activity; the pleasure of community and the pleasure of practice. 9 Recommendations for practice based upon this research are that ballroom dancing 10 should be highlighted in health promotion campaigns and as a suitable activity for social 11 prescribing, particularly given the evidence presented earlier that the majority of older 12 adults worldwide do not participate in sufficient physical activity for health gains. 13 Whilst promoting the pleasures of ballroom dancing is one factor that may encourage 14 participation, pleasure can enhance engagement with physical activity for older adults 15 and, in turn, healthy ageing. The importance of the social aspect of maintaining physical 16 activity in older adults was clearly demonstrated by the 'pleasure of community' theme, 17 therefore, health and exercise professionals should aim to incorporate a sense of 18 community and promote social forms of physical activity into their multifaceted 19 programme planning for older adults. It is also important for health and education 20 professionals to encourage positive encounters with physical activity across the life 21 course. It was found that many of the participants had positive experiences with 22 different forms of dancing during childhood or younger adult years, experiences that 23 they recalled as being pleasurable and had encouraged their choice to participate in 24 ballroom dancing in their older adult years.

Participants in this study demonstrated that pleasure, in its various complex forms, can be felt by the ageing body, in spite of chronic illness or disease, thus promoting positive ageing experiences. The pleasure gained from the activity encompasses several aspects; the activity is fun and enjoyable, it builds a sense of community, it encourages development of new skills, provides a sense of worth and an escape from every day worries. It was seen as an activity whereby the enjoyment was so great, it could mask one's pain and the physical aspect of the activity was not seen as something to 'endure', unlike attending the gym to exercise, for example. As a physical activity option, ballroom dancing classes can help form a homogenous group of people in the sense of their life stage, desire to dance, will to learn and interests but given the findings from this study, as an addition to the global ballroom dancing literature, it is also an activity that provides pleasure for older adults from diverse heterogeneous social and cultural backgrounds.

18 Declaration of interest: The authors report no conflicts of interest.

Acknowledgements: The authors would like to thank the lead author's PhD director of studies Dr John Stephenson and advisor Professor Marilynne N. Kirshbaum for their support.

1	References
2	
3	Abel, T. (2007). Chapter 5. Cultural Capital in Health Promotion. In: McQueen, D.V. &
4	Kickbusch, I. (Eds.), Health and modernity. The role of theory in health
5	promotion, (43-73). New York, NY: Springer Science & Business Media, LLC.
6	Abreu, M. & Hartley, G. (2013). The Effects of Salsa Dance on Balance, Gait, and Fall
7	Risk in a Sedentary Patient with Alzheimer's Dementia, Multiple Comorbidities,
8	and Recurrent Falls. Journal of Geriatric Physical Therapy, 2013(36), 100-108.
9	https://doi.org/10.1519/jpt.0b013e318267aa54
10	Allain, K.A. (2020). Winter of our contentment: Examining risk, pleasure, and
11	emplacement in later-life physical activity. Journal of Aging Studies, 55(2020),
12	100895. https://doi.org/10.1016/j/jaging.2020.100895
13	Arazi, H., Izadi, M. & Kabirian, H. (2022). Interactive effect of socio-eco-demographic
14	characteristics and perceived physical activity barriers on physical activity level
15	among older adults. European Review of Aging and Physical Activity, 19(8), 1-
16	11. https://doi.org/10.1186/s11556-022-00288-y
17	Barry, A-M. & Yuill, C. (2016). Understanding the Sociology of Health. 4th Edition.
18	London: Sage Publications Ltd.
19	Belardinelli, R., Lacalaprice, F., Ventrella, C., Volpe, L., & Faccenda, E. (2008). Waltz
20	dancing in patients with chronic heart failure. New form of exercise training.
21	Circulation: Heart Failure, 1, 101-114.
22	https://doi.org/10.1161/CIRCHEARTFAILURE.108.765727
23	Bennett, E.V., Clarke, L.H., Kowlaski, K.C. & Crocker, P.R.E. (2017). From pleasure
24	and pride to the fear of decline: Exploring the emotions in older women's

1	physical activity narratives. Psychology of Sport and Exercise, 33 (November
2	2017), 113-122. https://doi.org/10.1016/j.psychsport.2017.08.012
3	Beswick, A.D., Gooberman-Hill, R., Smith, A., Wylde, V., & Ebrahim, S. (2010).
4	Maintaining independence in older people. Reviews in clinical gerontology, 20,
5	128-153. https://doi.org/10.1017/s0959259810000079
6	Blanksby, B. A., & Reidy, P. W. (1988). Heart rate and estimated energy expenditure
7	during ballroom dancing. British Journal of Sports Medicine, 22(2), 57-60.
8	https://doi.org/10.1136/bjsm.22.2.57
9	Briggs, A.M., Cross, M.J., Hoy, D.G., Sànchez-Riera, L., Blyth, F.M., Woolf, A.D. &
10	March, L. (2016). Musculoskeletal health conditions represent a global threat to
11	healthy aging: A report for the 2015 World Health Organization World Report
12	on Ageing and Health. The Gerontologist. 56(S2), S243-S255.
13	https://doi.org/10.1093/geront/gnw002
14	Cabrita, M., Lousberg, R., Tabak, M., Hermens, H.J. & Vollenbroek-Hutten, M.M.R.
15	(2017). An exploratory study on the impact of daily activities on the pleasure
16	and physical activity of older adults. European Review of Aging and Physical
17	Activity, 14(1), 1-11. https://doi.org/10.1186/s11556-016-0170-2
18	Charmaz, K. (2014). Constructing Grounded Theory. 2 nd Edition. London: Sage
19	Publications Ltd.
20	Cheung-Ming, C. & Cao, T. (2015). Age-friendly neighbourhoods as civic participation
21	implementation of an active ageing policy in Hong Kong. Journal of Social
22	Work Practice, 29(1), 53-68. https://doi.org/10.1080/02650533.2014.993947
23	Chipperfield, S.R. & Stephenson, J. (2022). Ballroom Dancing for Community-
24	dwelling Older Adults: A 12-month Study of the Effect on Well-being, Balance

1	and Falls Risk. Activities, Adaptation & Aging, 46(2), 124-
2	140. https://doi.org/10.1080/01924788.2020.1797437
3	Cooper, L. & H. Thomas (2002). Growing old gracefully: social dance in the third age.
4	Ageing and Society, 22, 689-708. https://doi.org/10.1017/s0144686x02008929
5	Corbin, J. & Strauss, A.L. (2008). Basics of qualitative research. 3 rd Edition. Los
6	Angeles: Sage.
7	Crawford, R. (2006). Health as a meaningful social practice. Health: An
8	Interdisciplinary Journal for the Social Study of Health, Illness and Medicine,
9	10(4), 401-420. https://doi.org/10.1177/1363459306067310
10	Creswell, J. W. (2007). Qualitative Inquiry and Research Design Choosing Among Five
11	Approaches. Thousand Oaks, California: Sage Publications, Inc.
12	Dominiczak, P., Swinford, S., Morley, K. & Hyde, D. (2014, October 6). Retirement
13	age to rise by as much as six months per year. The Telegraph. Retrieved from:
14	http://www.telegraph.co.uk/finance/personalfinance/pensions/11144991/Retirem
15	entage-to-rise-by-as-much-as-six-months-per-year.html
16	Downward, P. & Dawson, P. (2016). Is it pleasure or health from leisure that we benefit
17	from most? An analysis of well-being alternatives and implications for policy.
18	Social Indicators Research, 126(1), 443-465. https://doi.org/10.1007/s11205-
19	<u>015-0887-8</u>
20	Doyle, L., Brady, A-M., & Byrne, G. (2009). An overview of mixed methods research.
21	Journal of Research in Nursing, 14(2), 175-185
22	https://doi.org/10.1177/1744987108093962
23	Ekkekakis, P., Parfitt, G., & Petruzello, S.J. (2011). The pleasure and displeasure people
24	feel when they exercise at different intensities. Decennial update and progress

1	towards a tripartite rationale for exercise intensity prescription. Sports Medicine,
2	41(8), 641-671. https://doi.org/10.2165/11590680-000000000-00000
3	Elhakeem, A., Hardy, R., Bann, D., Caleyachetty, R., Cosco, T.D., Hayhoe, R.P.G.,
4	Muthuri, S.G., Wilson, R. & Cooper, R. (2017). Intergenerational social
5	mobility and leisure-time physical activity in adulthood: a systematic review. J
6	Epidemiol Community Health, 71, 673—680. https://doi.org/10.1136/jech-2016-
7	<u>208052</u>
8	Fernández-Argüelles, E.L., Rodríguez-Mansilla, J., Antunez, L.E., Garrido-Ardila, E.M
9	& Muñoz, R.P. (2015). Effects of dancing on the risk of falling related factors of
10	healthy older adults: A systematic review. Archives of Gerontology and
11	Geriatrics, 60(2015), 1-8. https://doi.org/10.1016/j.archger.2014.10.003
12	Flynn, M.G. & Stewart, L.K. (2013). Chapter 5: Exercise, Nutrition and Aging. In:
13	Wilmoth, J.M. & Ferraro, K.F. (Eds.), Gerontology perspectives and issues, 4th
14	edition, (pp.91-126). New York, N.Y.: Springer Publishing Company, LLC.
15	Frazão, D.T., de Farias Junior, L.F., Dantas, T.C.B., Krinski, K., Elsangedy, H.M.,
16	Prestes, J., Hardcastle S.J. & Caldas Costa, E. (2016). Feeling of pleasure to
17	high-intensity interval exercise is dependent of the number of work bouts and
18	physical activity status. PLOS ONE, 11(3), 1-16.
19	https://doi.org/10.1371/journal.pone.0153986
20	Gale, N. K., Heath, G., Cameron, E., Rashid, S. & Redwood, S. (2013). Using the
21	framework method for the analysis of qualitative data in multi-disciplinary
22	health research. BMC Medical Research Methodology, 13(117), 1-8.
23	https://doi.org/10.1186/1471-2288-13-117
24	Gomes da Silva Borges, E., Gomes de Souza Vale, R., Cader, S.A., Leal, S., Miguel, F.,
25	Pernambuco, C.S., & Dantas, E.H.M. (2014). Postural Balance and falls in

I	elderly nursing home residents enrolled in a ballroom dancing programme.
2	Archives of Gerontology and Geriatrics, 59, 312-316.
3	https://doi.org/10.1016/j.archger.2014.03.013
4	Green, J., Tones, K., Cross, R., & Woodall, J. (2015). Health Promotion Planning and
5	Strategies. 3 rd Edition. London: Sage Publication Ltd.
6	Haboush, A., Floyd, M., Caron, J., LaSota, M., & Alvarez, K. (2006). Ballroom dance
7	lessons for geriatric depression: An exploratory study. The Arts in
8	Psychotherapy, 33(2006), 89-97. https://doi.org/10.1016/j.aip.2005.10.001
9	Hackney, M.E. & Earhart, G.M. (2009). Short duration, intensive tango dancing for
10	Parkinson Disease: An uncontrolled pilot study. Complementary Therapies in
11	Medicine, 17, 203-207. https://doi.org/10.1016/j.ctim.2008.10.005
12	Hackney, M.E., Kantorovich, S., Levin, R., & Earhart, G.M. (2007). Effects of tango on
13	functional mobility in Parkinson's Disease: A preliminary study. Journal of
14	Neurologic Physical Therapy, 31, 1-7.
15	https://doi.org/10.1097/NPT.0b013e31815ce78b
16	Hartwell, H. (2013). Wellbeing. Editorial. Perspectives on Public Health, 133(5), 230.
17	https://doi.org/10.1177/1757913913499982
18	Health and Social Care Information Centre (HSCIC). (2017). Health Survey for
19	England 2016 Physical Activity in Adults. NHS Digital. Retrieved from:
20	https://digital.nhs.uk/catalogue/PUB30169
21	Hicks, M.M. & Conner, N.E. (2013). Resilient ageing: a concept analysis. <i>Journal of</i>
22	Advanced Nursing, 70(4), 744-755. https://doi.org/10.1111/jan.12226
23	Hulbert, S., Ashburn, A., Roberts, L. & Verheyden, G. (2017). Dance for Parkinson's-
24	The effects on whole body co-ordination during turning around. Complementary

1 *Therapies in Medicine, 32*(2017), 91-97. 2 https://doi.org/10.1016/j.ctim.2017.03.012 3 Jallinoja, P., Pajari, P., & Abstez, P. (2010). Negotiated pleasures in health-seeking 4 lifestyles of participants of a health promoting intervention. Health, 14(2), 115-5 130. https://doi.org/10.1177/1363459309353292 6 Jensen, J.M. (2001). I'd rather be dancing: Wisconsin women moving on. Frontiers, 7 22(1), 1-20. https://doi.org/10.1353/fro.2001.0010 8 Kattenstroth, J-C., Kalisch, T., Kolankowska, I. & Dinse, H.R. (2011). Balance, 9 sensorimotor, and cognitive performance in long-year expert ballroom dancers. 10 Journal of Aging Research, 1-10. https://doi.org/10.4061/2011/176709 11 Koch, S.C., Mergheim, K., Raeke, J., Machado, C.B., Riegner, E., Nolden, J., Diermayr, 12 G., von Moreau, D. & Hillecke, T.K. (2016). The Embodied Self in Parkinson's 13 Disease: Feasibility of a Single Tango Intervention for Assessing Changed in 14 Psychological Health Outcomes and Aesthetic Experience. Frontiers in 15 Neuroscience, July 2016(10), 1-13. https://doi.org/10.3389/fnins.2016.00287 16 Larkin, M. (2013). Health and Wellbeing across the Life Course. London: Sage 17 Publications Ltd. 18 Lenneis, V. & Pfister, G. (2017). Health messages, middle-aged women and the 19 pleasure of play. Annals of Leisure Research, 20(1), 55-74. 20 https://doi.org/10.1080/11745398.2016.1207091 21 Lima, M. M. S., & Vieira, A. P. (2007). Ballroom dance as therapy for the elderly in 22 Brazil. American Journal of Dance Therapy, 29(2), 129-142. 23 https://doi.org/10.1007/s10465-007-9040-9 24 Lindelöf, N., Lundin-Olsson, L., Skelton, D.A., Lundman, B. & Rosendhal, E. (2017). 25 Experiences of older people with dementia participating in a high intensity

1	functional exercise program in nursing homes: "While it's tough, it's useful".
2	PLoS ONE, 12(11), 1-14. https://doi.org/10.137/journal.pone.0188225
3	Mansfield, L., Daykin, N. & Kay, T. (2020). Leisure and Well-being. Leisure Studies.
4	39(1), 1-10. https://doi.org/10.1080/02614367.2020.1713195
5	McKinley, P., Jacobson, A., Leroux, A., Bednarczyk, V., Rossignol, M., & Fung, J.
6	(2008). Effect of a community-based Argentine tango dance program on
7	functional balance and confidence in older adults. Journal of Aging and Physical
8	Activity, 16, 435- 453. https://doi.org/10.1123/japa.16.4.435
9	Mikkelsen, H.H. (2017) Never too late for pleasure: Aging, neoliberalism, and the
10	politics of potentiality in Denmark. American Ethnologist, 44(4), 646-656.
11	https://doi.org/10.1111/amet.12563
12	Morgan, D.L. (2014). Pragmatism as a paradigm for Social Research. Qualitative
13	Inquiry. 20(8), 1045-1053. https://doi.org/10.1177/1077800413513733
14	National Institute for Health and Care Excellence (NICE). (2013). Falls: assessment
15	and prevention of falls in older people. NICE Clinical Guideline 161. Retrieved
16	from: https://www.nice.org.uk/guidance/cg161/
17	National Perinatal Epidemiology Unit (NPEU) (n.d.). Index of Multiple Deprivation.
18	Retrieved from: https://tools.npeu.ox.ac.uk/imd/
19	Padgett, D.K. (2012). Qualitative and Mixed Methods in Public Health. Thousand Oaks,
20	CA: Sage Publications Inc.
21	Phoenix, C. and Orr, N. (2014). Pleasure: A forgotten dimension of physical activity in
22	older age. Social Science and Medicine, 115(2014), 94-102.
23	https://doi.org/10.1016/j.socscimed.2014.06.013
24	Pinniger, R., Brown, R.F., Thorsteinsson, E.B., & McKinley, P. (2012). Tango
25	programme for individuals with age-related macular degeneration. The British

1	Journal of Visual Impairment, 31(1), 47-59.
2	https://doi.org/10.1177/0264619612470651
3	Public Health England. (2019). Musculoskeletal Health: A 5-year strategic framework
4	for prevention across the lifecourse. Retrieved from:
5	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/atta
6	<pre>chment_data/file/810348/Musculoskeletal_Health_5_year_strategy.pdf</pre>
7	Rios Romenets, S., Anang, J., Fereshtehnejad, S-M., Pelletier, A. & Postuma, R. (2015).
8	Tango for treatment of motor and non-motor manifestations in Parkinson's
9	disease: A randomized control study. Complementary Therapies in Medicine,
10	2015(23), 175-184. https://doi.org/10.1016/j.ctim.2015.01.015
11	Ritchie, J. & Spencer, L. (1994). Chapter 9: Qualitative data analysis for applied policy
12	research. IN Bryman, A., & Burgess, R.G. (Eds) Analysing Qualitative data.
13	(305-329). London: Routledge.
14	Roberson, D. & Pelclova, J. (2013). Social Dancing and Older Adults: Playground for
15	Physical Activity. Ageing International, June. https://doi.org/10.1007/s12126-013-
16	9184-5Rodio, A.M. & Holmes, A. (2017). Lessons Learned from Ballroom
17	Dancing with Older Adults. Social Work with Groups, 40(1-2), 69-76.
18	https://doi.org/10.1080/01609513.2015.1066580
19	Rösler, A., Seifritz, E., Kräuchi, K., Spoerl, D., Brokuslaus, I., Propserpi, S-M., Gendre,
20	A., Savaskan, E., Hofmann, M. (2002). Skill learning in patients with moderate
21	Alzheimer's Disease: a prospective pilot-study of waltz-lessons. <i>International</i>
22	Journal of Geriatric Psychiatry, 17, 1155-1156. https://doi.org/10.1002/gps.705:
23	10.1002/gps.705
24	Samsi, K. & Manthorpe, J. (2020). NIHR School for Social Care Research. Interviewing
25	people living with dementia in social care research. Methods review. Retrieved

1	from: https://www.sscr.nihr.ac.uk/wp-content/uploads/SSCR-methods-
2	review_MR022.pdf
3	Shilling, C. (2003). Changing Bodies: Habit, Crisis and Creativity. Sage: London.
4	Skinner, J. (2010). Work/Leisure Balances and the Creation of a Carnival
5	Cosmopolitanism amongst Salsa Dancers. Intergraph Journal for Dialogic
6	Anthropology, 2(2). http://www.intergraph-
7	journal.net/enhanced/vol2issue2/12.html
8	Smith, B. & McGannon, K.R. (2018). Developing rigor in qualitative research:
9	problems and opportunities within sport and exercise psychology. International
10	review of sport and exercise psychology. 11(1), 101-121.
11	https://doi.org/10.1080/1750984X.2017.1317357
12	Smith, B., Sparkes, A.C., Phoenix, C. & Kirkby, J. (2012). Qualitative research in
13	physical therapy: A critical discussion on mixed-methods research. Physical
14	Therapy Review, 17(6), 374-381.
15	https://doi.org/10.1179/1743288x12y.00000000000
16	Stenner, B.J., Mosewich, A.D & Buckley, J.D. (2020). Why do older adults play golf?
17	An evaluation of factors related to gold participation by older adults. Journal of
18	Aging and Physical Activity. 28(3), 399-405. https://doi.org/10.1123/japa.2018-
19	<u>0448</u>
20	Srivastava, A. & Thomson, S.B. (2009). Framework Analysis: A qualitative
21	Methodology for Applied Policy Research. Journal of Administration and
22	Governance, 4(2), 72-79.
23	http://www.joaag.com/uploads/06 Research Note Srivastava and Thomson 4
24	_2pdf

1 Stevens-Ratchford, R.G. (2016). Ballroom Dance: Linking Serious Leisure to 2 Successful Aging. The International Journal of Aging and Human Development, 83(3), 290-308. https://doi.org/10.1177/0091415016652405 3 4 Strauss, A. & Corbin, A.L. (1998). Basics of Qualitative Research: Grounded Theory Procedures and Techniques. 2nd Edition. Thousand Oaks, CA: Sage. 5 6 The Lancet. (2012). Ageing Well: A global priority. Editorial. *The Lancet*, 379 (7) 7 April), 1274. https://doi.org/10.1016/s0140-6736(12)60518-2 8 Thomas, H. & L. Cooper (2002). Dancing into the third age: Social dance as cultural 9 text- research in progress. Dance Research, 2002(20), 54-80. 10 https://doi.org/10.3366/1290869 Toates, F. (2011). *Biological Psychology*. 3rd Edition. Harlow: Pearson Education 11 12 Limited. 13 Tong, A., Sainsbury, P. & Craig, J. (2007) Consolidated criteria for reporting qualitative 14 research (COREQ): a 32-item checklist for interviews and focus groups. 15 *International Journal for Quality in Healthcare.* 19(6), 349-357. 16 https://doi.apa.org/doi/10.1037/t74064-000 17 Trost, S.G., Owen, N., Bauman, A.E., Sallis, J.F. & Brown, W. (2002). Correlates of 18 adults' participation in physical activity: review and update. Medicine and 19 Science in Sports and Exercise, 34(12), 1996-2001. 20 https://doi.org/10.1097/00005768-200212000-00020 21 Verghese, J., Lipton, R.B, Katz, M.J, Hall, C.B., Derby, C.A., Kuslansky, G., Ambrose, 22 A.F., Sliwinski, M. & Buschke, H. (2003). Leisure activities and the risk of 23 dementia in the elderly. The New England Journal of Medicine, 348(25), 2508-24 2516.

1	Verghese, J. (2006). Cognitive and Mobility Profile of Older Social Dancers. Journal of
2	the American Geriatrics Society., August. 54(8), 1241-1244.
3	https://doi.org/10.1111/j.1532-5415.2006.00808.x
4	Vitti, S.N., Moore, A., Dalton, P.C., & O'Neil. (2018). The influence of self-selected
5	music on affect-regulated exercise intensity and remembered pleasure during
6	treadmill running. Sport, Exercise, and Performance Psychology, 7(1), 80-92.
7	https://doi.org/10.1037/spy0000115
8	Wainwright, S. P. and Turner. B.S. (2006). 'Just crumbling to bits'? An exploration of
9	the body, ageing injury and career in classical ballet dancers. Sociology, 40(2),
10	237-255. https://doi.org/10.1177/0038038506062031
11	Ward, D.J., Furber, C., Tierney, S., & Swallow, V. (2013). Using framework analysis in
12	nursing research: A worked example. Journal of Advanced Nursing, 69(11),
13	2423-2431. https://doi.org/10.1111/jan.12127
14	Wolff, J.K., Warner, L.M., Ziegelmann, J.P. & Wurm, S. (2014). What do targeting
15	positive views on ageing add to a physical activity intervention in older adults?
16	Results from a randomised controlled trial. Psychology & Health, 29(8), 915-
17	932. https://doi.org/10.1080/08870446.2014.896464
18	World Health Organization (WHO). (2021). Musculoskeletal Conditions. Retrieved
19	from: https://www.who.int/news-room/fact-sheets/detail/musculoskeletal-
20	conditions
21	
22	
23	
24	

1 Table 1 Participant Demographics and Pseudonyms

2	Participant Number	Gender (M/F)	Age at start of trial	BMI category	Falls at 0 months	Medication at 0 months	Dancing hours/week at 0 months	Other exercise at 0 months	Pseudonym	Single or Dyad interview
2	1	F	63	Missing	No	Yes	1	Yes	Sheila	Patrick
Severely	•		64		3.7	***	1	37	D 1	G1 '1
3	2	M	64		No	Yes	1	Yes	Patrick	Sheila
4 F 67 Normal/healthy healthy Yes No 1 Yes Isabel Florer 5 M 68 obese No Yes 2 Yes Les Single 6 M 72 Overweight No Yes 1 Yes Eric Irene Eric 7 F 71 Overweight No Yes 1 Yes Irene Eric 8 M 67 Overweight No Yes 2 Yes Isaac Claire Isaac 9 F 63 healthy No Yes 2 Yes Pamela Single 10 F 58 Overweight No Yes 1 Yes Pamela Single 11 M 67 healthy No Yes 1 Yes Michael Emily Michael Emily Michael Emily Michael Semily	3	F	78		No	Yes	1	Yes	Florence	Isabel
5 M 68 Severely obese No Yes 2 Yes Les Single for June 6 M 72 Overweight No Yes 1 Yes Eric Irene 7 F 71 Overweight No Yes 1 Yes Irene Eric 8 M 67 Overweight No Yes 2 Yes Isaac Claire Isaac 10 F 58 Overweight No Yes 1 Yes Pamela Single 11 M 67 healthy No Yes 1 Yes Pamela Single 12 F 62 Overweight No No No 1 Yes Emily Michael Emily 13 F 83 Missing Yes Yes 1 Yes Kathleen Single 14 F 68 obese No Yes 1 No Rober				Normal/						
5 M 68 obese No Yes 2 Yes Les Single 6 M 72 Overweight No Yes 1 Yes Eric Irene Eric 7 F 71 Overweight No Yes 1 Yes Irene Eric 8 M 67 Overweight No Yes 2 Yes Isaac Claire 9 F 63 healthy No Yes 2 Yes Pamela Single 10 F 58 Overweight No Yes 1 Yes Pamela Single 11 M 67 healthy No Yes 1 Yes Emily Michael Emily	4	F	67		Yes	No	1	Yes	Isabel	Florence
6 M 72 Overweight No Yes 1 Yes Eric Irene 7 F 71 Overweight No Yes 1 Yes Irene Eric 8 M 67 Overweight No Yes 2 Yes Isaac Claire 9 F 63 healthy No Yes 2 Yes Claire Isaac 10 F 58 Overweight No Yes 1 Yes Pamela Single 11 M 67 healthy No Yes 1 Yes Michael Emily Michael 12 F 62 Overweight No No 1 Yes Emily Michael 13 F 83 Missing Yes Yes 1 No Brenda Robert 14 F 68 obese No Yes 1 <t< td=""><td>5</td><td>М</td><td>68</td><td></td><td>No</td><td>Ves</td><td>2</td><td>Ves</td><td>Les</td><td>Single</td></t<>	5	М	68		No	Ves	2	Ves	Les	Single
7 F 71 Overweight No Yes 1 Yes Irene Eric 8 M 67 Overweight No Yes 2 Yes Isaac Claire 9 F 63 healthy No Yes 2 Yes Claire Isaac 10 F 58 Overweight No Yes 1 Yes Pamela Single 11 M 67 healthy No Yes 1 Yes Pamela Single 12 F 62 Overweight No No 1 Yes Emily Michael Emily 13 F 83 Missing Yes Yes 1 Yes Kathleen Single 14 F 68 obese No Yes 1 No Brenda Robert 15 M 72 Overweight No Yes 1										
8 M 67 Overweight Nomal/Normal/No										
9 F 63 Normal/healthy No Yes 2 Yes Claire Isaac 10 F 58 Overweight No Yes 1 Yes Pamela Single 11 M 67 healthy No Yes 1 Yes Michael Emily Michael Pemily Michael Pemily Michael Pemily										
9 F 63 healthy No Yes 2 Yes Claire Isaac 10 F 58 Overweight No Yes 1 Yes Pamela Single 11 M 67 healthy No Yes 1 Yes Michael Emily 12 F 62 Overweight No No 1 Yes Emily Michael Emily 13 F 83 Missing Yes Yes 1 Yes Kathleen Single 14 F 68 obese No Yes 1 No Brenda Robert 15 M 72 Overweight No Yes 1 No Robert Brenda 16 F 67 healthy No Yes 2 No Elsie William 17 M 65 healthy No Yes 1	8	IVI	67		No	Yes	<u> </u>	Y es	Isaac	Claire
11	9	F	63		No	Yes	2	Yes	Claire	Isaac
11	10	F	58	Overweight	No	Yes	1	Yes	Pamela	Single
12 F 62 Overweight No No 1 Yes Emily Michae 13 F 83 Missing Yes Yes 1 Yes Kathleen Single 14 F 68 obese No Yes 1 No Brenda Robert 15 M 72 Overweight No Yes 1 No Robert Brenda 16 F 67 healthy No Yes 2 No Elsie William 17 M 65 healthy No Yes 1 Yes William Elsie 18 F 62 Overweight No Yes 1 No Jeane Alan 19 M 67 Overweight No Yes 1 No Daniel Single 20 M 75 healthy No Yes 1 Yes Richard				Normal/						
13 F 83 Missing Yes Yes I Yes Kathleen Single 14 F 68 obese No Yes 1 No Brenda Robert 15 M 72 Overweight No Yes 1 No Robert Brenda 16 F 67 healthy No Yes 2 No Elsie William 17 M 65 healthy No Yes 1 Yes William Elsie 18 F 62 Overweight No Yes 1 No Jeane Alan Jeane 19 M 67 Overweight No Yes 1 No Daniel Single 20 M 75 healthy No Yes 1 No Daniel Single 21 M 71 Overweight No Yes 1	11			healthy	No	Yes	1	Yes	Michael	Emily
14 F 68 Severely obese No Yes 1 No Brenda Robert 15 M 72 Overweight No Yes 1 No Robert Brenda 16 F 67 healthy No Yes 2 No Elsie William 17 M 65 healthy No Yes 1 Yes William Elsie 18 F 62 Overweight No Yes 1 No Jeane Alan 19 M 67 Overweight No Yes 1 Yes Alan Jeane 20 M 75 healthy No Yes 1 No Daniel Single 21 M 71 Overweight Yes Yes 1 Yes Rachel Richard 22 F 59 Overweight No Yes 1 Yes	12	F	62	Overweight	No	No	1	Yes	Emily	Michael
14 F 68 obese No Yes 1 No Brenda Robert 15 M 72 Overweight No Yes 1 No Robert Brenda 16 F 67 healthy No Yes 2 No Elsie William 17 M 65 healthy No Yes 1 Yes William Elsie 18 F 62 Overweight No Yes 1 No Jeane Alan 19 M 67 Overweight No Yes 1 No Daniel Single 20 M 75 healthy No Yes 1 No Daniel Single 21 M 71 Overweight Yes Yes 1 Yes Rachel Richa 22 F 59 Overweight No Yes 1 Yes <t< td=""><td>13</td><td>F</td><td>83</td><td></td><td>Yes</td><td>Yes</td><td>1</td><td>Yes</td><td>Kathleen</td><td>Single</td></t<>	13	F	83		Yes	Yes	1	Yes	Kathleen	Single
15 M 72 Overweight No Normal/ Normal/ healthy No Yes 1 No Robert Brend 16 F 67 healthy No Yes 2 No Elsie William 17 M 65 healthy No Yes 1 Yes William Elsie 18 F 62 Overweight No Yes 1 No Jeane Alan 19 M 67 Overweight No Yes 1 No Daniel Single 20 M 75 healthy No Yes 1 No Daniel Single 21 M 71 Overweight Yes Yes 1 Yes Rachel Richard 22 F 59 Overweight No Yes 1 Yes Rachel Richard 23 M 65 healthy Yes Yes 1 <td>4.4</td> <td></td> <td>60</td> <td></td> <td></td> <td></td> <td></td> <td>3.7</td> <td>- ·</td> <td>D 1</td>	4.4		60					3.7	- ·	D 1
16 F 67 Normal/healthy No Yes 2 No Elsie William 17 M 65 healthy No Yes 1 Yes William Elsie 18 F 62 Overweight No Yes 1 No Jeane Alan 19 M 67 Overweight No Yes 1 Yes Alan Jeane 20 M 75 healthy No Yes 1 No Daniel Single 21 M 71 Overweight Yes Yes 1 Yes Richard Rachel 22 F 59 Overweight No Yes 1 Yes Rachel Richard 23 M 65 healthy Yes Yes 1 Yes Amy Rod 24 F 61 Overweight No Yes 1 Yes										
16 F 67 healthy No Yes 2 No Elsie William 17 M 65 healthy No Yes 1 Yes William Elsie 18 F 62 Overweight No Yes 1 No Jeane Alan 19 M 67 Overweight No Yes 1 Yes Alan Jeane 20 M 75 healthy No Yes 1 No Daniel Single 21 M 71 Overweight Yes Yes 1 Yes Richard Rachel 22 F 59 Overweight No Yes 1 Yes Rod Amy 23 M 65 healthy Yes Yes 1 Yes Rod Amy 24 F 61 Overweight No Yes 1 Yes Ronni	15	M	72		No	Yes	1	No	Robert	Brenda
17 M 65 Normal/healthy No Yes 1 Yes William Elsie 18 F 62 Overweight No Yes 1 No Jeane Alan 19 M 67 Overweight No Yes 1 Yes Alan Jeane 20 M 75 healthy No Yes 1 No Daniel Single 21 M 71 Overweight Yes Yes 1 Yes Richard Rachel 22 F 59 Overweight No Yes 1 Yes Rachel Richard 23 M 65 healthy Yes Yes 1 Yes Rod Amy 24 F 61 Overweight No Yes 1 Yes Ronnie Julie	16	F	67		No	Yes	2	No	Elsie	William
18 F 62 Overweight No Yes 1 No Jeane Alan 19 M 67 Overweight No Yes 1 Yes Alan Jeane 20 M 75 healthy No Yes 1 No Daniel Single 21 M 71 Overweight Yes Yes 1 Yes Richard Rachel 22 F 59 Overweight No Yes 1 Yes Rachel Richard 23 M 65 healthy Yes Yes 1 Yes Rod Amy 24 F 61 Overweight No Yes 1 Yes Amy Rod 25 M 61 Overweight No Yes 1 Yes Ronnie Julie										
19 M 67 Overweight No Yes 1 Yes Alan Jeane 20 M 75 healthy No Yes 1 No Daniel Single 21 M 71 Overweight Yes Yes 1 Yes Richard Rachel 22 F 59 Overweight No Yes 1 Yes Rachel Richard 23 M 65 healthy Yes Yes 1 Yes Rod Amy 24 F 61 Overweight No Yes 1 Yes Amy Rod 25 M 61 Overweight No Yes 1 Yes Ronnie Julie	17	M	65	healthy	No	Yes	1	Yes	William	Elsie
20 M 75 Normal/healthy No Yes 1 No Daniel Single 21 M 71 Overweight Yes Yes 1 Yes Richard Rachel 22 F 59 Overweight No Yes 1 Yes Rachel Richard 23 M 65 healthy Yes Yes 1 Yes Rod Amy 24 F 61 Overweight No Yes 1 Yes Amy Rod 25 M 61 Overweight No Yes 1 Yes Ronnie Julie	18	F	62	Overweight	No	Yes	1	No	Jeane	Alan
20 M 75 healthy No Yes 1 No Daniel Single 21 M 71 Overweight Yes Yes 1 Yes Richard Rachel 22 F 59 Overweight No Yes 1 Yes Rachel Richard 23 M 65 healthy Yes Yes 1 Yes Rod Amy 24 F 61 Overweight No Yes 1 Yes Amy Rod 25 M 61 Overweight No Yes 1 Yes Ronnie Julie	19	M	67		No	Yes	1	Yes	Alan	Jeane
21 M 71 Overweight Yes Yes 1 Yes Richard Rachel 22 F 59 Overweight No Yes 1 Yes Rachel Richard 23 M 65 healthy Yes Yes 1 Yes Rod Amy 24 F 61 Overweight No Yes 1 Yes Amy Rod 25 M 61 Overweight No Yes 1 Yes Ronnie Julie	20	M	75		No	Vac	1	No	Danial	Cinala
22 F 59 Overweight No Yes 1 Yes Rachel Richa 23 M 65 healthy Yes Yes 1 Yes Rod Amy 24 F 61 Overweight No Yes 1 Yes Amy Rod 25 M 61 Overweight No Yes 1 Yes Ronnie Julie				i i			-			
23 M 65 Normal/healthy Yes Yes 1 Yes Rod Amy 24 F 61 Overweight No Yes 1 Yes Amy Rod 25 M 61 Overweight No Yes 1 Yes Ronnie Julie										
23 M 65 healthy Yes Yes 1 Yes Rod Amy 24 F 61 Overweight No Yes 1 Yes Amy Rod 25 M 61 Overweight No Yes 1 Yes Ronnie Julie	22	F	59		No	Yes	1	Yes	Rachel	Richard
24 F 61 Overweight No Yes 1 Yes Amy Rod 25 M 61 Overweight No Yes 1 Yes Ronnie Julie	23	M	65		Yes	Yes	1	Yes	Rod	Amy
25 M 61 Overweight No Yes 1 Yes Ronnie Julie				Ī						•
									-	
LZD F DU Uverweight NO Yes L LYes Liube Ronni	26	F	60	Overweight	No	Yes	1	Yes	Julie	Ronnie

Table 2 Categorisation of socioeconomic groups by Index of Multiple Deprivation scores

Quintile group	IMD score range	Participants n=26	%
1	≤ 8.49 (Least deprived)	4	15.4
2	8.5 - 13.79	7	26.9
3	13.8 - 21.35	7	26.9
4	21.36 - 34.17	7	26.9
5	≥ 34.18 (Most deprived)	1	3.85