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Enabling quality, sustainable physical activity change in older adults – a study of barriers, facilitators and interventions.

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Statement of originality and ownership of work

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MA Exercise and Health Studies

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Abstract

Background

In the recent census (2016) the 65+ age group saw the greatest increase, rising by 19.1% (Central Statistics Office, 2016). The Irish Longitudinal Study on Ageing (TILDA) found that 34% of older adults in Ireland report low levels of physical activity (Donoghue, 2016).

Methodology

This study sought to identify barriers and facilitators to PA for older adults (Phase I) in a convenience, sample (n=300) of community dwelling older adults. These were stratified by age, urban and rural location, gender, and physical activity (PA) level (high, medium or low / inactive). They completed a questionnaire in May 2015 which was based on social ecological theory. Following consultation with stakeholders in various settings, a series of interventions were developed and implemented in Phase II. Pre and Post questionnaires were administered (March 2016) to those who took part in the interventions (n=45). Analysis of interventions was conducted using the REAIM framework (Glasgow, 1999). Additionally, qualitative interviews were conducted with stakeholders (n=5) to further examine enablers and barriers to implementation.

Results

Phase I found the majority of older adults were not sufficiently active (69%) nor sufficiently aware of PA guidelines (61%). Knowing the guidelines is a facilitator to PA. The main barriers to PA were poor knowledge of PA guidelines, antipathy towards gym, perceived high cost of PA and lack of basic walking programmes. In Phase II Reach (programme uptake) was low. It varied between 0.085% to 0.2% in urban areas and from 3.9% to 8% in rural areas. In total, 65 participants took part across 5 selected settings. The interventions increased PA frequency from 3.09 days per week (SD 1.72) pre intervention to 3.36 days (SD 1.5) post intervention. Muscle strengthening activities increased significantly from 1.33 days per week pre intervention to 1.88 days per week post (p=.001). The interventions had mixed success but all stakeholders indicated a willingness to continue the programmes.

Conclusion

Reach could be improved by specific targeting of older adults. Important success factors for implementation of older adult programmes should include capacity building (audit of staff and facilities, appropriate instructor training, buy in from key management personnel in the settings. Sustainability of programmes can be achieved by the availability of sustainable funding which allows for long term implementation of programmes.

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List of Abbreviations

EU	European Union
WHO	World Health Organisation
TILDA	The Irish Longitudinal Study on Ageing
PA	Physical Activity
IPAQ	International Physical Activity Questionnaire
IPAQ-SF	International Physical Activity Questionnaire – Short Format
IPAQ-E	International Physical Activity Questionnaire – Elderly
PACE	Patient Assessment and Counselling for Exercise
MVPA	Moderate to Vigorous Physical Activity
SHARE	Study of Health, Aging and Retirement
ADL	Activities of Daily Living
ELSA	English Longitudinal Study of Ageing
SEM	Social Ecological Model
SE	Self Efficacy
CHAT	Community Health Advice by Telephone
GP	General Practitioner
NEWS	Neighbourhood Environmental Walkability Scale
OFE	Outdoor Fitness Equipment
NPAP	National Physical Activity Plan
LSP	Local Sports Partnership

PALS	Physical Activity Leaders
SCT	Social Cognitive Theory
TTM	Trans Theoretical Model
GALM	Gronningen Active Living Model
OA	Osteo-Arhtritis
SDB	Social Desirability Bias
HP	Haas-Pratschke Deprivation Index
PARQ	Physical Activity Readiness Questionnaire
SPSS	Statistical Package for Social Sciences

1 Introduction

1.1 Background

Since 2006, there has been a 37% growth in the number of persons aged over 65 years in Ireland, and this figure continues to grow at double the European Union (EU) rate (19%; Department of Health, 2013). The male population aged over 85 has increased by 24.8% to 23,062 while the female population increased by 11.4% to 44,493 (Central Statistics Office, 2016). Those aged 65 years and over previously represented about 11% of the population in Ireland but by 2031 this will have risen to 19% and is predicted to keep rising to a stage where just over one-third of the population on the island of Ireland will be aged 60 years or over (Centre for Ageing Research and Development in Ireland, 2009). In Kilkenny, according to the 2016 census, 14.16% of the population is over 65 years (Central Statistics Office, 2016). Unfortunately, this increased longevity is not necessarily accompanied by good health or quality of life. It is predicted that by the year 2020 there will be a 40% increase in the number of adults with chronic disease affecting mainly those over 65 years (Balanda, 2010). This older adult population growth coupled with the onset of poor health will present society with a number of key challenges in terms of public services provision, pensions, public health and planning for retirement (Foresight, 2008).

In addition to this there has been considerable change to traditional retirement age and career length, with many people choosing to work longer (Foresight, 2008). In Ireland in 2011, the older age group (50+) made up 23.4% of the labour force but projections are that this will reach 30.3% of the labour force by 2026. By 2028, workers will not qualify for the State Pension until 68 years compared to 66 years in 2018 (The Pensions Authority, 2018). The Organisation for Economic Co-Operation and Development (2014) says that among Irish workers aged 30 to 65 years, only around 60% are enrolled in an occupational or pension plan. While retirement can positively influence health, equally, health can influence retirement decisions (Sahlgren, 2013). A study conducted in Ireland by Schinkel-Ivy, Mosca and Mansfield (2017) looked at factors that contributed to forced unexpected retirement and unemployment. The authors found that in addition to the medical conditions found in previous research to be predictors of unexpected retirement or unemployment in this population other health related factors such as functional capacity and frailty can also lead to

adverse work outcomes (Schinkel-Ivy, 2017). Time spent working can mean less time for attending to health needs and also less time for physical activity (Doyle, 2005).

1.2 Heterogeneity of older adults

The older adult cohort is a very diverse group. There is no single definition of an older adult or general consensus on the age at which a person is categorised as 'old'. Spirduso and colleagues suggest that those aged 65-74 are classified as 'young old', those aged 75-84 are classified as 'old' and those 85-99 are 'old-old' and anybody 100+ are the 'oldest old' (Spirduso, 2005). Many physical activity studies have included age ranges of 30 years or more and important differences within and between older adults can be missed (Whaley, 2014). When implementing physical activity programmes, it is important to know what works to address this heterogeneity.

1.3 Defining 'Older Adult'

The term 'older adult' has been defined by the World Health Organisation (WHO, 2013) as those aged over 65 years or those in receipt of a pension. However, elsewhere in the literature 'older adult' has been defined as those over 50 years. For example, King (2010) says that it is necessary to define older adults as those over 50 years because this phase of life presents an opportunity to prevent physical and mental decline. It is also the time at which sedentary habits increase and as such, physical activity can be used to enhance health and quality of life and to help prevent the onset of chronic disease associated with entering the 6^{th} decade of life (Sun, 2010). The Active Retirement Network of Ireland have used the over 50 years concept because this is 'the age when people are most likely to take up retirement or semi-retirement and it can be a point in people's lives at which their circumstances begin to change in ways that have implications for the future' (Active Retirement Network Ireland, 2009, p3). The research presented here included all those aged over 50 years.

The National Positive Aging Strategy recognises at national level the need for all sectors to plan for an ageing population. It says we need to support older adults in their enjoyment of good physical and mental health and to provide opportunities for continued involvement in social life according to their needs, capacities and preferences (Department of Health, 2013)

1.4 Physical activity for optimal health

Research has found that physical activity which is tailored, and specially adapted, can be of benefit to even the most frail and oldest sector of the population (Pahor, 2006). Conversely,

physical inactivity is linked with poor health such as increased risk of premature death, heart disease, some cancers, type II diabetes, excessive weight gain and osteoporosis (Physical Activity Guidelines Advisory Committee, 2008). Participation in regular physical activity among older adults is important for slowing down, reducing or preventing much of the functional decline associated with ageing and maintaining long-term physical, cognitive, and emotional health (Bethancourt 2014). The World Health Organisation (2010), states that when older adults take part in walking, cycling for transport, household work, sports, games and planned exercise, it has the effect of improving functional fitness, cardiovascular and muscular strength. Achieving the recommended guidelines for physical activity has the added benefits of reducing the risk of non-communicable diseases, slowing cognitive decline and maintaining good mental health (Mazzeo, 2014). The National Guidelines for Physical Activity for Ireland recommends that people over 65 should engage in 30 minutes a day of moderate intensity activity on five days a week, or 150 per week. Shorter bouts of activity count towards the guidelines and these should last for at least 10 minutes. Older adults should focus on aerobic activity, and also include muscle-strengthening and balance activities on 2-3 days per week as these reduce the risk of falls. Older adults are advised to match their level of effort to their level of fitness. Those with degenerative conditions, chronic illness or lack of mobility should be as active as their condition allows (Department of Health and Children, 2009).

1.5 Participation levels

The Irish Longitudinal Study on Ageing (TILDA, 2014) used the International Physical Activity Questionnaire (IPAQ) to measure physical activity and found that 34% of older adults in Ireland report low levels of physical activity (accumulate less than 30 minutes of moderate intensity exercise per week). Physical activity among older adults declines with age: 27% of those aged 52-64 were low active compared to 50% of those aged 75 and over (Nolan, 2014). Older men were found to be more physically active than women and notwithstanding age, those with higher education attainment report higher levels of physical activity. In addition to this, those with lowest socio-economic status report lowest levels of physical activity (Barrett, 2011).

Finally, physical activity is undoubtedly beneficial for older adults for maintaining optimal health at every age. The guidelines for optimal health are clearly defined by the WHO.

However, the majority of Irish older adults report low levels of physical activity and this has many consequences for them personally and also for society as a whole.

1.6 Aim of this study

The aim of this study is to assess levels of physical activity in older adults and to liaise with stakeholders to find sustainable ways of enabling older adults become more physically active.

1.7 The Research Questions

The Research Questions are:

1. What levels of physical activity are currently being achieved by older adults?
2. What are the perceived barriers and facilitators to older adult participation in physical activity?
3. What activities / strategies would older adults like to see implemented to help them achieve the optimal physical activity guidelines?
4. What was the impact of the physical activity interventions in increasing physical activity participation among the study participants?

1.8 Structure of the thesis

The literature review provides a background to the study, reviewing literature relevant to the research questions. The Methodology chapter gives a detailed explanation of the research design, recruitment procedures, sampling and the instruments used to gather the data. The Results Chapter presents findings from both Phase I (questionnaire) and II (interventions) of the study. Finally, a Discussion section will review the findings of the research and offer possible explanations for the outcomes, as well as study limitations. This chapter will also contain some recommendations for future research and policy.

2 Literature Review

2.1 Prevalence of PA in Older Adults in Ireland

Measurement of PA in older adults is fraught with many challenges – the appropriateness of direct or indirect measurement and measurement of different dimensions (frequency, intensity, time, type). While evidence regarding the benefits of physical activity for health have become more apparent over the past number of decades, up to the 1990's it had been difficult to compare and monitor participation levels due to the absence of a globally accepted measurement instrument (Hallal, 2012). However, surveillance methods have been improved with the development and introduction of the international physical activity questionnaire (IPAQ) as a common instrument for the comparison of levels of physical activity. Because over two-thirds of all countries use the standardised IPAQ, assessment and comparison can be done on worldwide patterns of physical activity (Hallal, 2012). Van Cauwenberg (2011) says that accelerometery and reliable, validated physical activity questionnaires (such as IPAQ) should be used in the measurement of physical activity. While self-report questionnaires may be effective for ease of administration, cost effectiveness and effectiveness in measuring intense activity (Besson, 2010), they may be deemed less reliable measuring light or moderate activity (Jacobs, 1993). For older adults too, changing cognitive ability may lead to challenges in recall, difficulties in understanding IPAQ instructions, activity logs and wording used in self-report questionnaires (Kowalski, 2012). Furthermore, for older adults well-structured questionnaires, which have clear definitions of time use, are considered significantly reliable and valid when working with groups (van der Ploeg, 2010).

While the IPAQ is used extensively for physical activity measurement in those aged under 65 years, there is scant evidence into its effectiveness for those aged over 65 years. Heesch et al. (2010) advised caution using it with older adults because of difficulties older adults have in recall of typical week / past week. Over reporting of activity was the most common problem (Heesch, 2010). Hurtig-Wennlof et al. (2010) introduced a modified version of the IPAQ, the IPAQ-SF (short format), the IPAQ-E for the elderly. The order of some of the questions was altered. All activity domains showed a positive correlation to the objectively measurement generated by accelerometers (Hurtig-Wennlof, 2010).

When measuring how often people perform certain behaviours, it is a common approach to ask respondents about their behaviour during a typical week or during the past week as there

may sometimes be a difference. For various reasons the previous week may have been an irregular week so therefore, the respondents are asked to recall their behaviour in a typical or regular week. This helps evaluate long term behaviour more accurately (Chang, 2003). The single item measure asked participants to report the number of days (0-7) they were physically active at a moderate to vigorous level for at least 30 minutes in the past 7 days. The Patient Assessment & Counselling for Exercise (PACE) is a validated method of measuring physical activity and is based on social cognitive theory and the Trans Theoretical Model. PACE + measurement uses two items to assess physical activity. Item one of the PACE + was a replica of the single item measure, while item two of the PACE + asked the same question with respect to a typical or usual week (Prochaska et al. 2001). An average of the two items produced a score of days per week that the participants accumulated at least 30 minutes of moderate to vigorous physical activity (MVPA). The International Physical Activity Questionnaire – Short Form (IPAQ-SF) had 9 items which require each participant to report on how many days they are physically active at a walking, moderate and vigorous intensity. Then the measure asks for what duration on an average day the participant is involved in each of the three activities.

The National Guidelines for Physical Activity for Ireland (2009) recommends that people over 65 should engage in 30 minutes a day of moderate intensity activity on five days a week, (150 per week) or at least 75 minutes of vigorous intensity aerobic activity throughout the week. Shorter bouts of activity count towards the guidelines and these should last for 10 minutes. Older adults should focus on aerobic activity, and also include muscle-strengthening activities involving all the major muscle groups and balance activities on 2-3 days per week as these reduce the risk of falls. Older adults are advised to match their level of effort to their level of fitness. Those with degenerative conditions, chronic illness or lack of mobility should be as active as their ability and condition allows (Department of Health and Children, 2009). Very few older adults meet the recommended physical activity guidelines. In America, over 60% fail to meet guidelines (US Department of Health and Human Services, 2008). In England 17% of women and 20% of men aged 65-74 years reach the recommended activity levels for moderate to vigorous activity and these figures decline to 6% and 9% respectively after the age of 75 years (Townsend, 2012). In Ireland, TILDA, 2013 found that only 33% of those aged over 50 years report moderate levels of PA with only 34% reporting high levels of PA. Moreover, PA levels decline with age as the following table shows.

Age Grouping	% meeting physical activity guidelines
50-64 years	37%
65-69 years	32%
70-74 years	28%
Over 75 years	18%

Table 1. *Shows the rate of decline in PA in older adults in Ireland (Donoghue, 2016).*

The TILDA report found that women are between 1.5 and 2 times as likely to be inadequately active than men and this is true across all the age groupings (Cronin, 2011). It also found that older adults with higher education attainment report higher levels of physical activity, regardless of age. Taking into account socio-economic status, low levels of physical activity were reported by 40% of those in the lowest wealth quartile. This compares to 25% of those in the wealthiest quartile (Cronin, 2011).

Results from the second wave of the TILDA study (2014) showed that levels of physical activity had declined from the previous set of results. The decline was more pronounced among older age groups (between the two time points, 29% of those aged over 75 years had transitioned to low levels of physical activity); only 14% of those aged 50-64 transitioned to low levels of activity). Between the two waves of results from TILDA, women were more likely to reduce their level of physical activity than men (TILDA, 2014). One of the largest social studies ever conducted in Ireland, The Healthy Ireland Survey 2016 largely supports data from TILDA. In addition to TILDA data, the Healthy Ireland Survey found that older adult men (68%) are more likely than women (57%) to be aware of physical activity guidelines. Additionally men (61%) compared to women (56%) believe they do enough physical activity. Healthy Ireland Survey found that, in reality, only 20% (men) and 11% (women) are sufficiently active. The desire to become more active was higher in women than in men. Overall, Healthy Ireland Study says that its findings 'present challenges in encouraging people to become more active' (p.25 Ipsos MRBI, 2016).

In a survey of 1,000 people aged over 50 which was undertaken for Sport Ireland and Age & Opportunity's Go for Life programme showed a positive shift in PA levels of older adults. It

emerged that 26% of all older people are 'highly active'. A further 27% are 'medium active', up from a previous figure of 18%. This equates to a combined total of 53% and means that for the first time since the surveys began in 2006, there are now more active older adults than there are 'low' or 'not active' in Ireland. Those that now report themselves to be active at a medium level seem to have transitioned from low levels of activity. Almost half (47%) of those aged 50-64 years now take part in PA, which is an increase from 34%. Socio-economic status was a significant factor in participation as 49% of ABC1s (a consumer from one of the three higher social and economic groups, which consist of people who have better educational attainment and better-paid jobs) reported being active when compared to 34% of C2DEs (the three lower social and economic groups). Physical activity declines with age from 47% of those aged 50-64 yeas to 34% of those aged 65+years (Perceptive Insight, 2015). The Irish Sports Monitor (2015) reports a decline in participation levels for males and female aged over 65 years when compared with 2013 levels. Only 25.7% of those aged 65 years and older participate in sports, decreasing from the 2013 figure of 29.9% (Ipsos MRBI, 2015). Walking is a very important way of being active and is the most popular form of activity in Ireland, especially among older age groups, even more so among females than males as the table below shows.

	55-64 years	**65+ years**
Males	64.4%	62.8%
Females	75.5%	67.3%

***Table 2**. Shows levels of walking in Irish older adults.*

The majority of sport and physical activity for older adults in Ireland is delivered through the private sector and, in general, older adults report being happy with the facility once they have sought it out. Being a member of a sports or social group increases the likelihood of being more active but numbers of older adults who are members of such a group has dropped from 47% in 2006 to 41% in 2008 (Ipsos MORI, 2011). Despite this, the number of 'highly active' older people increased and at the same time there was a drop in the number of low active older people (Ipsos MORI, 2011).

2.2 Health Benefits of physical activity for older adults

The benefits of regular physical activity for older adults are numerous. PA reduces the risk of cardiovascular disease, helps regulate blood pressure, and reduces the risk of developing metabolic disease, cholesterol and enlarged waist circumference (Haskell, 2007). In addition to this it can reduce the risk of thromboembolic stroke, type 2 diabetes, obesity, colon cancer and breast cancer (Haskell, 2007). PA can help improve cardiovascular risk factors as it slows the process of atherosclerosis and as such, effective interventions to promote PA in older adults are crucial (Chen, 2013). Physical activity can reduce the risk of falls and injuries from falls and this in turn can help to moderate the loss of independence and quality of life associated with falls (Guo, 2014). Results from the first wave of TILDA study found that, in Ireland, 19% of men and 25% of women have had a fall in the last year (Barrett, 2011). This number increases to 30% of individuals aged over 75 years. Approximately 10% of those over 50 years in Ireland report having had a fall that required medical treatment (Barrett, 2011). Many older adults who experience falls 'confine themselves to their homes, thus incresing the liklihood of social exclusion and reduced physical activity, which further inreases the risk of additional falls' (Craig, 2012, p11). To counteract falls, its important to undertake physical activity that includes high impact weight bearing activities such as walking, hiking, jogging, climbing stairs, tennis and dancing (U.S. Department of Health and Human Services, 2004). This type of activity is effective in promoting stronger bones with higher bone mineral density and hence those who do fall are less likely to suffer bone fracture. However, the problems faced when promoting and presenting PA programmes is behaviour change and compliance to such PA programmes and protocols (McMillan, 2017).

Many longitudinal studies have focussed on the impact of PA on cognitive functioning and the majority suggest that physical activity can preserve cognitive function. In The Study of Health, Ageing and Retirement (SHARE, 2010), a longitudinal study using data from 17,333 community dwelling European adults over 50 years, the association between physical activity and cognitive performance (delayed word recall and verbal fluency) was measured. In the two and a half year follow up, it was found that physical inactivity was associated with a high rate of cognitive decline. However, those who engaged in moderate and vigorous physical activity experienced less cognitive decline (Aichberger, 2010). Furthermore, in a review of 40 systematic reviews of physical activity and ageing in community dwelling older adults Olanrewaju and colleagues suggest that there is strong evidence to suggest that physical activity (aerobic), muscle strengthening exercise and walking can offer benefits including the

retention of cognition in older adults without previous cognitive impairment. Olanrewaju's systematic review defined physical exercise as planned, structured and repetitive physical activity which has as its objective, the improvement or maintenance of physical fitness. The exercise can be done as part of a group or alone and could be supervised, unsupervised. The studies considered were diverse in content and delivery and this resulted in a variation of effects reported. However, none of the studies reviewed reported any negative association between PA and healthy aging (Olanrewaju, 2016). In addition to cognitive benefits, it has been found that older adults who are physically active also score lower on loneliness scales than their low active counterparts – active women scored 1.9 versus 2.4 for less active (Donoghue, 2016). Clinical depression symptoms are more likely to present in low active older adults of all ages compared to those who report high levels of physical activity (14% versus 6%) (Donoghue, 2016). Physical activity can assist with the management of depression and anxiety in older adults (Brosse, 2002). This has important implications as depressive symptoms have been associated with cognitive decline in normally functional older adults (Stathi, 2002). However, the challenge is to convince older adults to change long term negative attitudes, cultural norms and beliefs to physical activity (McMillan, 2017).

Overall, physical inactivity is the fourth leading risk factor contributing to the global burden of disease and death and ranks ahead of overweight or obesity (Lee, 2012). The following diagram shows a conceptual framework for the benefits of physical activity in older adults. 'Strong' epidemiological evidence of having an effect on aging is reported for the items marked * (US Department of Health and Human Services Physical Activity Guidelines Advisory Report, 2008). While epidemiological studies can never prove causation (that a specific risk factor actually causes the disease), epidemiological evidence can show that a risk factor is associated or correlated with a high incidence of disease in the population exposed to that risk factor (Porta, 2014).

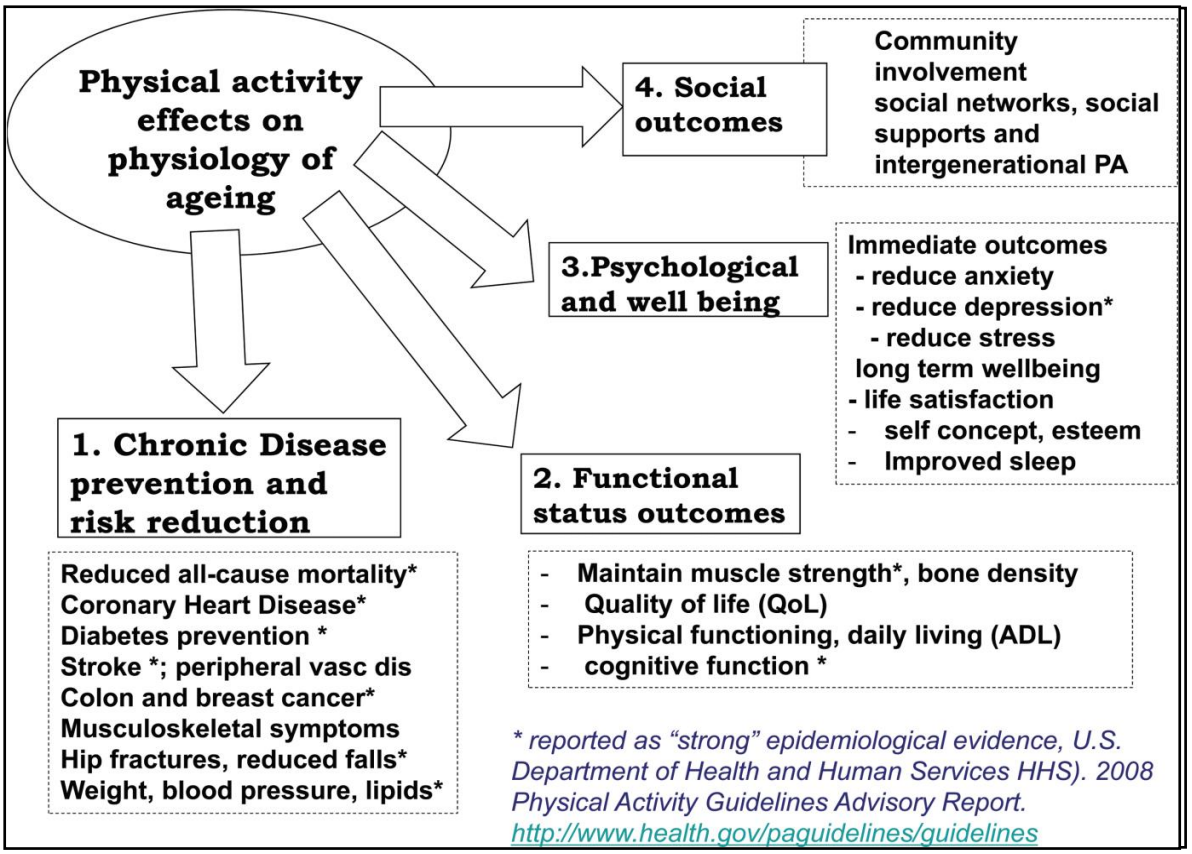

Figure 1. *The effects of physical activity on ageing. Retrieved from http://www.health.gov/paguidelines/guidelines.*

2.3 Healthy aging

While there is no standardised definition of healthy ageing, various studies define it as either survival to a certain age; health status, and physical performance/disability; absence of disease; or ability to perform activities of daily living (ADL). In a systematic review by Daskalopoulou (2017), consistent evidence was found from 23 longitudinal studies to suggest that PA is positively associated with healthy ageing. Men who are physically active are 1.6 times more likely to be free of functional or mental loss after 10-13 years follow up (Almeida, 2013). Older adults who are physically active from middle age have doubled the odds of healthy ageing when compared to those who are only mildly active or inactive (Britton, 2008). The English Longitudinal Study of Ageing (ELSA) noted that those who did moderate or vigorous PA were 3.1 to 4.3 times more likely to age in good health. Many studies focus on the effects of PA on healthy ageing in mid life. Hamer et al (2014) found that sustained PA from middle age into older age is associated with longevity and better health even in those that only become active relatively late in life (Hamer, 2014). Furthermore, Stressman (2009) suggests that continuing or beginning PA was associated with better function and survival even in the very old (Stressman, 2009).

2.4 Using Theory to inform PA interventions in older adults

Because PA is affected by many different factors, behavioural models are used to choose the variables to study (Bauman, 2002). The social ecological model (SEM) focuses on multiple correlates that affect people's behaviour. Originating in the work of Lewin and Bronfenbrenner (1979), the SEM places the individual at the centre of their environment and focuses on the importance of the social and physical environments because these strongly shape patterns of disease and injury. These environments also shape our responses to injury and disease over the entire lifespan (Fielding, 2010). The SEM is 'a model of health that emphasizes the linkages and relationships among multiple factors (or determinants) affecting health' (Committee on Educating Public Health Professionals for the 21st Century, 2003, p.5). Critically, health behaviours such as physical activity participation, can be improved if individuals are educated and motivated to make the healthier choices. Moreover, having a supportive environment and physical activity promoting policy helps make these choices easier. These choices take place throughout life from early childhood influences through childhood, adolescence, young adult, middle age and older adult. The SEM framework is used to understand determinants of health, plan PA and relevant outcomes, and organise interventions (Sallis, 2008). The most successful physical activity interventions target change across four levels – individual, interpersonal, physical environment and policy. Figure 2 below illustrates the different layers of the SEM.

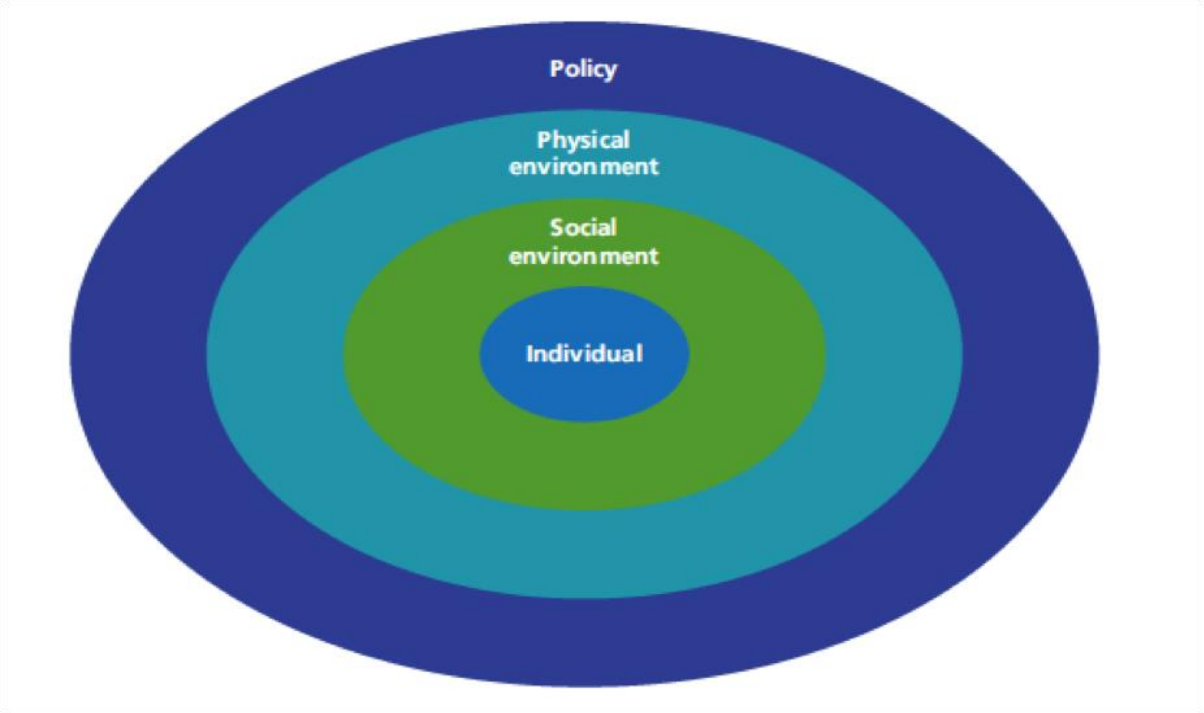

Figure 2. *Levels within the Socio-Ecological Model.*

2.5 Individual factors that influence physical activity in older adults

At the centre of the SEM, the individual level shows personal factors that might increase the likelihood of physical activity participation. There are three sub-levels at individual level: demographic characteristics (age, sex, marital status, employment status and education); psychological (attitudes, preferences, beliefs, intentions and self-efficacy); behavioural (knowledge, disability, habits and skills);. The following section looks at some of the individual factors affecting physical activity and why they should be considered for further study. It has been shown that demographic factors such as age, sex, health status, marital status, educational attainment and employment status affect levels of PA (Bauman, 2012).

2.5.1 Demographic factors

Sex

Sex is a strong predictor of physical activity. For a variety of reasons (family, societal roles and life conditions) females are more likely than males to be inactive (Giuli, 2011). In a cross-sectional study of 1,937 older adults with a median age of 77 years, Moschny (2011) found that there were substantial differences between males and females in terms of levels of, and attitudes to, PA. Traditional gender role assignment showed that older German males were more likely to take part in sporting activities, whereas females were more likely to face constraints such as domestic activities. Females cited lack of opportunities for physical activity and also lack of transport to settings as the main reasons for not taking part in physical activity (Moschny, 2011). In Ireland too, sex determines physical activity levels among older adults (Murtagh, 2015). Overall, men in Ireland are less likely to take care of their health than women, (Richardson, 2008). However, the TILDA study found that men are more likely to be physically active than women (Cronin, 2011). In fact, females in Ireland are over twice as likely to be inactive. Moreover, rural dwelling females, who may be retired, have poor emotional health and a possible illness, are highly likely to be inactive (Murtagh, 2015). Women, who are currently over 60 years would more than likely have assumed the more traditional domestic roles of homemaker and child care in the past, with little opportunity for social interaction outside the home and beyond family structure. This meant most females were less likely to take part in sport or exercise (United Nations, 2007).

Age

Age is a correlate of physical activity in older adults – as age increases physical activity levels decline (Bauman, 2012). In Ireland those over 75 years are almost twice as likely to

report low levels of physical activity as those aged 50-64 years (27% versus 51%) (Donoghue, 2016). In the TILDA study, middle aged older adults in Ireland, that are more physically active, are more likely to have better quality of life. Quality of life is defined by such criteria as the ability to walk across a room, use the toilet, cook a hot meal and manage money and better self-rated health; a predictor for future disease, functional decline, use of healthcare and mortality (Donoghue, 2016). As mentioned already, older adults are not a homogeneous population and age is not an accurate predictor of functional status, therefore consideration needs to be given to this when planning PA interventions.

2.5.2 Psychological

Attitudes to physical activity

In an Australian study of 217 older adults, Newson and Kemps (2007) found many varied reasons to promote physical activity. However, many older adults, both women and men would not have a culture of taking part in organised leisure time PA or formal exercise and as such may be prone to sedentary behaviour and resistant to initiation of any form of PA (Newson, 2007). Historically, older women have a different perception of physical activity than males and, according to Bailey (2005), they may be more reluctant to take part in organised sports as they often perceive the main purpose of exercise as being weight loss. Consequently, this reluctance can effect participation in physically activity and the potential health benefits that may accrue (Bailey, 2005). Overall, being physically active is not high on the list of healthy activities of European older adults (Afonso, 2001). Food (42%), smoking habits (40%) and alcohol (24%) all precede physical activity in the list of perceived determinants of health. Furthermore, it was found that 64% of those surveyed believed they did not need to increase PA levels, whilst an additional 37% who were not active did not intend to become active within 6 months of the survey. These findings highlight problems regarding older adults' attitude to PA and knowledge of its importance. Afonso and colleagues concluded that there is a need to promote physical activity programmes in order to increase older adult physical activity (Afonso, 2001).

Self-efficacy

Self efficacy and self concept are significant contributors to self esteem which in turn can affect PA behaviour (Spirduso, 2005). Older adults with high levels of self-efficacy are generally more optimistic about their ability to set goals and accomplish them, and, as a result, have higher levels of physical activity (Locke & Latham, 1990). Furthermore, Bandura

(1977) says that individuals with high levels of self-efficacy are more likely to explore their environment, accept new challenges in new settings. For example, an older adult trying to become more active, exploring new activities in new settings could be deemed to be showing high levels of self-efficacy. Conversely, those with low self-esteem are more likely to be pessimistic, less likely to be able to set and achieve personal goals and, hence, are less likely to achieve physical activity levels (Perkins, 2008). In a study of older adults aged 63-92, Perkins et al (2008) examined the relationship between self-efficacy and physical activity levels. Using the Physical Activity Self-Efficacy Measure developed by Resnick (2000), they found that, universally, the predicted relationship between self-efficacy and physical and social activity exists and they suggest that in order to increase physical activity in older adults, health educators should develop interventions that help build self-efficacy in older adults (Perkins, 2008). Falls affect nearly one third of community dwelling older adults each year which are costly in terms of lost health benefits, independence, physical function and morbidity (Tinetti, 2003). Falls and fear of falling have an indirect impact on confidence in balance maintenance and, as such, are other considerations within the psychological domain of the socio ecological model. Having higher levels of SE usually means higher confidence levels to deal with the effects of falls (Tinetti, 2003).

Motivation and enjoyment

Despite the abundance of knowledge from research which indicates the benefits of physical activity for older adults – motivating older adults to be more active remains problematic and this group continue to be difficult to engage with (Bennett, 2011). Belief and expectation that physical activity will be fun and enjoyable has been found to be a motivator, predictor and an outcome of increased levels of PA participation. The expectancy that physical activity provides a positive feeling is a predictor of adoption and maintenance (Dacey, 2008). Even if exercise programmes are found to be effective, they often lose their impact if they cannot be sustained. Consequently, more research is needed into lapses in attendance and drop out (Bennett, 2007). However, a simple cognitive-behavioural therapy approach delivered by phone or computer, over a one year period, was successful in motivating older adults, to become more active (King, 2007). The Community Health Advice by Telephone (CHAT) trial was effective in helping older adults maintain PA levels at 12 months. Motivational interviewing, which is client-based counselling aimed at eliciting behaviour change has been found to boost self-efficacy for exercise (Miller, 1992).

2.6 Social environment factors that influence physical activity in older adults

Social Support

Smith et al. (2017) conducted a systematic review of the association between social support and PA. They found evidence surrounding the relationship between social support and PA in older adults. Social support (having interaction with friends and family) is an important factor in helping older adults to be physically active. PA interventions should consider this important source of social support at planning stage and should include some 'buddy' style interventions (Smith, 2017). High levels of mutual trust and feelings of community among neighbours are also linked to increased physical activity levels (Saelens, 2003). Having a friend to support and attend physical activity sessions with has a major influence on activity levels (Resnick, 2002). Resnick examined the relationship between social supports (family, friends and exercise professional support) and self-efficacy, exercise behaviour and outcome expectations in a cohort of older adults in a retirement centre. It was found that friend support boosted self-efficacy and outcome expectation and thus should be incorporated into any physical activity intervention. The study took care in a care retirement community where the small group (n=74) of Caucasian, well educated residents had social support through frequent contact with friends. Resnick and colleagues concluded that this had a significant influence on exercise behaviour but that the results were probably sample specific (Resnick, 2002). An important element of physical activity is the socialisation and companionship that participants can avail of. Damush et al (2005) say that being in a group gives individuals social support. Social support can also be garnered from friends, relatives, health professionals and is a significant motivating factor to continue with physical activity (Damush, 2005). Other studies (Farrance, 2016, Komatsu, 2017) have shown conclusively that those who exercise as part of a structured, unified group are more likely to comply with an exercise programme than if they were exercising alone.

General Practitioners

Social support appears to be associated with physical activity in adults and youth. Trost et al. (2002) suggests that social support from friends/peers and family/spouse is particularly important. General Practitioners (GPs) are perceived to be a major source of health information and therefore have a key role to play in promoting PA (Whitlock, 2002). However, further research by Glasgow and colleagues suggests that PA advice from GPs is usually in response to a disease or condition (usually secondary or tertiary prevention rather than primary prevention) (Glasgow, 2001). Balde (2003) found that GPs do not necessarily

discuss physical activity with patients and a study found that while 95% of older adults visited their GP in the previous year, only 62% received any advice regarding physical activity (Balde, 2003). GPs could have a crucial role in helping to increase older adults physical activity levels in an effort to promote healthy aging. It has been found that GPs who themselves lead sedentary lifestyles are less likely to encourage sedentary patients to become active, whereas physically active physicians are more likely to discuss exercise with their patient (Stanford, 2013). A qualitative study by Costello and colleagues (2013) sought to establish the role of the GP in promoting physical activity. The study used both physically active and inactive older adults (>60 years). Both active and inactive participants felt that they had either limited or inadequate discussions with their GP in relation to physical activity and only the physically active group felt that their GP was an extrinsic motivator for PA. Furthermore, participants felt that their GP was unable to provide them with adequate information regarding PA guidelines and that GP's were uncomfortable when discussing PA. Discussions about PA were usually in relation to pre-existing conditions and GP's never initiated the conversation (Costello, 2013). The study suggested that because they are seen as an authority on health and because they have regular contact with older adults, GP's are in a unique position to promote PA. To conclude, older adults are more likely to adopt a healthier lifestyle when counselled by medical professionals (International Council on Active Aging, 2005).

Instructor influence on older adult physical activity

Data from 193 older adult participants (aged 60-100 years) in 26 classes and also data from 16 instructors was used in a longitudinal study conducted by Hawley-Hague into the multiple levels of influence on older adult attendance and adherence to Community Exercise Classes. It emerged that the instructor had no influence on exercise adherence. What was important for the participants, however, was that the instructor did not appear too extrovert or over intelligent and that delivery of classes was 'person-centred' (Hawley-Hague, 2014). The study noted that, in line with general population, drop out from older adult classes usually occurred within the first three months. The more experience an instructor had indicated higher likelihood of success in participant adherence during the first three months, when self-efficacy levels of participants are formed. Having training in Motivational Interviewing (Miller, 2013) also contributed to adherence (Hawley-Hague, 2014).

In a systematic review of qualitative literature, Franco et al. (2015) identified dependence on professional instruction as a social influence on physical acivity. Older adults appreciate classes where the instructor takes the individuals' needs and ability into consideration. The review found that in 30% of the studies, having a good instructor meant participants felt safe, more welcomed and more likely to enjoy the class (Franco, 2015). Elsewhere, a cross-sectional study by Seguin et al (2010) examining why so few older women participate in strength-training exercies found that the role of the instructor and community leader was crucial in promoting adherence. The Strong Women Programme had 970 programme paticipants in 23 US States. It emerged that leader's sports participation and prior experience leading programmes had a positive effect on exercise adherence (Seguin, 2003). In Ireland, Age and Opportunity train Physical Activity Leaders (PALS) to lead physical activity with their own groups and the programme has been evaluated. Lower numbers of men volunteer to be leaders – 91% of leaders are female. Additionally, men are likely to drop out altogether, or not lead and organise their group. Only 25% of trained PALS are leading activity on a regular basis and a further 40% organise physical activity (sourcing equipment, applying for funding). Furthermore, a third of those trained cited lack of opportunity as the reason they do not lead physical activities (Go for Life, 2010).

2.7 Physical Environment factors that influence physical activity in older adults

The physical environment which is characterised as any place people spend time. The consideration is how this is likely to influence physical activity with regard to access to parks, playgrounds, gymnasiums, walking facilities. The perceived quality and safety of these facilities will influence whether a person will take part or not (Bauman, 2007). Critical to participation too is the design of the built environment: a person's surroundings, geographic location, climate and weather. Bauman et al. further suggests that concentrating on individual level attributes only may not be adequate in trying to understand the differences in physical activity levels of older adults. They propose that research should consider environmental factors, particularly neighbourhood and community as well as individual level factors (demographic and psychosocial) when assessing factors that enable physical activity. Readily available physical activity facilities, safe and comfortable facilities, street connectivity and population density decide how conducive the environment is to physical activity (Li, 2005). Poor perception of the environment is an important factor in predicting low levels of activity (Fisher, 2018). Living a long distance from amenities is an indicator for low levels of physical activity, whereas living within a half mile of amenities points towards

being more physically active (Frank, 2010). Living adjacent to swimming pools, bike paths and suitable walking routes is correlated to higher levels of participation in physical activity (Booth, 2000). Additionally, perceptions about weather and seasonal influences, personal safety concerns and access to car/public transport are seen as environmental barriers to participation in PA (Stathi, 2014).

2.7.1 Exercise Setting

Most physical activity programmes aimed at older adults use a group-based structure to encourage physical activity uptake and adherence, especially those that use cognitive-behavioural approaches (Rejeski, 2003). King (2010) suggests that not enough attention has been paid to capturing older adult social networks such as family, friends, healthcare providers, pharmacists and church/faith based organisations. Further investigation of these links should provide long term influence on sustainable physical activity levels (King, 2010).

On the other hand, some older adults prefer to avoid structured or group settings. Bethancourt (2014) found that older adults are put off by the competitive nature of gyms. Similarly older adults can feel uncomfortable in exercise clothing and may also feel apprehensive about being able to keep up to the pace in an exercise class. Fear of being last or slowing down the group is a potential barrier to taking part in group exercise (Bethancourt, 2014). Many older adults prefer solitary exercise but recognised that attending activities in a group setting (gym or community) with a fun, knowledgeable instructor is very important.Those with reduced physical health and of advanced age, living alone or in a care facility, might benefit from modest increases in physical activity in their setting (Physical Activity Guidelines Advisory Committee, 2008). Additionally, it has been suggested that future research should examine the various domains of PA instead of total PA because time in active transport, doing household tasks and gardening can be considered physical activity (Bauman, 2012).

2.7.2 Urban rural status

Cleland (2015) says that in order to understand the association between environment and physical activity levels it is important to consider urban-rural status (Cleland, 2015). In a study of 3,888 adults aged between 55 and 65 years, rural adults had better perceived safety but urban adults perceived their environment to be better for physical activity. Furthermore, rural dwellers reported more total time PA but urban had more leisure time PA and more transport (Cleland, 2015). In Ireland, rural dwelling older adults are more likely to suffer poor health when compared to urban older adults. Many depopulated rural areas lack opportunities

for social activities, have inadequate public transport and lack connectivity and socialisation opportunities including physical activity (Connolly, 2012). Walking has been found to have a positive effect on physical activity levels (Donoghue, 2016). However, rural roads quite often have no footpaths or lighting and this can be a barrier to walking (the most common form of physical activity in Ireland) or walking to and from community physical activity programmes. Rural community buildings are less likely to be older adult friendly for those with mobility issues (steps, entrance and lighting) (Wenger, 2001). This evidence further supports Cleland's call for all policies and programmes that target creating PA friendly enviroments (Cleland, 2015). When planning walking programmes for older adults, a broad perspective is required. It is important to consider the interplay that exists between not only individual characteristics, including urban / rural status, but also the immediate physical and social environment (Cauwenberg, 2014).

2.7.3 Footpaths and Neighbourhood Walkability

The Neighbourhood Environmental Walkability Scale (NEWS), (Saelens, 2003) which has been validated in several countries, suggests that a neighbourhood is shaped by the following components: residential density, commercial density, land use mix and street connectivity for walking/cycling, neighbourhood aesthetics, traffic, crime and neighbourhood satisfaction. Highly walkable neighbourhoods enable residents to remain mobile and also contribute to lower obesity levels (Saelens, 2003). Remaining mobile means older adults are able to stay connected to nearby community services and resources and from this perspective, it is crucial to determine which environmental factors facilitate or impede these outcomes (Yen, 2012). The UK National Travel Survey (2005) found that upwards of 45% of older adults (>70 years) take a 20 minute walk less than once per year, or never. In Ireland, older adults achieving 150 minutes per week of walking tend to be more socially active and are healthier overall. Walking is the most popular source of physical activity for older adults in Ireland (Ipsos MRBI, 2015). The TILDA Report suggests promotion of policies and programmes that encourage more walking especially among Irish adults over 50 years (Donoghue, 2016). Preserving the ability to walk outdoors is a priority of older adults well-being, independence and a major way to maintain mobility (Eronen, 2014). In addition to social support and facility access, older adults who reported availability of safe footpaths were more frequently physically active (Booth, 2000). Again, spatial access, attractive public open spaces and access to footpaths were associated with higher levels of walking and vigorous activity (Booth, 2000). However, older adults have a different perception of the built environment

and often report footpath obstructions where general population see none. Similarly, Rosenberg (2013) found that older adults perceive themselves invisible to drivers. They also felt that, traffic moves too fast, footpath surfaces are not of good quality; there is a lack of proper road crossings, too many hills and outdoor stairs (steps). For older adults, these are further barriers to walking which can ultimately make them stay at home (Rosenberg, 2013).

2.7.4 Access to Parks

Cohen (2007) found that public parks, situated close to residential communities is strongly associated with good levels of physical activity. Interviewees said that the park was where they exercised most and those living closest to the parks achieved higher levels of physical activity. However, Kaczynski (2008) found that many older adults remain sedentary during their park visits. They sit on benches and chat to friends. Kaczynski suggests that parks with more features are more likely to be used for physical activty. Hence, the installation of outdoor fitness equipment (OFE) might encourage older adults to be more active (Kaczynski, 2008). Payne (2005) concurs, arguing that setting up OFE in parks and making them available free or at a low cost would not only encourage older adults to be more physically active but would also be seen as good environmental design (Payne, 2005).

2.7.5 Car dependency – driving status

In Ireland, older adults risk social exclusion if they do not own a car, or have family or friends to provide transport. Due to lack of public or privately run transport, 37% of rural dwelling older adults have need of a car due to lack of public or privately run transport (Davey, 2007). However, participation in PA accounted for less than 3% of all trips made by either males or females (Davey, 2007). Murtagh (2015) says that Irish older adults who do not look after grandchildren, attend a course or own a car are more likely to be inactive. However, this is not always the case. In Sweden, for example, Berg (2015) conducted a qualitative study on car use among newly retired people who were car owners. It was found that the majority of the study cohort, who, despite being car oweners, still frequently availed of the opportunity to walk for health reasons. Being retired, owning a car and healthy afforded them more time to choose which mode of transport to use and this usually resulted in increased amounts of walking and cycling (Berg, 2015).

2.8 Policy factors that influence physical activity in older adults

The outer layer of the SEM concerns policy level and how interventions such as new legislation and procedures, urban planning policies promoting active travel, education

policies and national physical activity plans / recommendations can impact on behaviour and influence change (Bower, 2013). Altering policy to increase physical activity is one of the high level factors in the SEM that affect physical activity. It can affect whole populations over a long period of time and can be either informal at local level or, can be formal legislation at national level. Partnerships or actions can introduce and support new programmes or pledge additional resources to make it easier for people to engage in physical activity. Changing policy represents the best chance of changing levels of physical activity at population level (Bauman, 2012). However, developments may be restricted by government structure, funding constraints, traditions and cultural behaviours (King, 2010).

The number of countries who are introducing national physical activity plans is increasing but it is too early to estimate the effectiveness of these plans and many of these plans do not take into account the diverse needs of the older adult population (Bornstein, 2009). The National Guidelines on Physical Activity for Ireland were published in 2009 (Department of Health and Children, 2009). Following on from this in 2016, the Irish Government launched the National Physical Activity Plan (NPAP) (Healthy Ireland, 2016). The Plan recognises that behaviour change is difficult, challenging and time consuming and so focuses on sustainable solutions to getting Irish people of all ages and ability more physically active. It recommends agreed levels of physical activity for people of all ages and provides information for those working in the promotion of physical activity, although it does not extend to other health care professionals. Thirdly, it guides people to information available on becoming more physically active. The key target is to promote the idea that physical activity is a part of everyday life, give people more opportunities to be active and ultimately increase the number of people taking regular exercise by 1% per year over ten years. It states among its aims: *'Older people (aged 65+) Increase by 1% per annum the number of older people undertaking at least 150 minutes of moderate-intensity aerobic physical activity throughout the week or 75 minutes of vigorous-intensity activity throughout the week, or an equivalent combination. Decrease by 0.5% per annum in the proportion of older adults who do not take any weekly physical activity'* (Healthy Ireland, 2016, p.13). There are 8 Action Areas in the National Physical Activity Plan with older adults listed as a specific target group (Healthy Ireland, 2016). Furthermore, Healthy Ireland (2016) has an action that aims to 'Support, link with and further improve existing partnerships, strategies and initiatives that aim to support older people to maintain, improve or manage

their physical and mental wellbeing (Action 3.5) and seeks to 'remove barriers to participation and to provide more opportunities for the involvement of older people in all aspects of cultural, economic and social life in their communities' (Action 3.6). A number of the mediums that support the strategies and facilitate the implementation of the NPAP are discussed in some detail below.

2.8.1 Local Sports Partnerships

Sport Ireland promotes the idea of nationwide Local Sports Partnerships (LSPs) in its strategy. Among other things, LSPs are tasked with establishing networks, providing information and increasing levels of participation in physical activity in target groups such as older adults. They participate in local Age Friendly Cities committees. Through their strategic plans they are also responsible, at local level, for the delivery of national programmes such as *Go for Life, Men On The Move, Get Ireland Walking.* LSPs also provide older adult physical actitivity programmes (Pilates, swimming, aqua aerobics) in areas where commercial providers may not consider.

2.8.2 Age-Friendly Cities

The Global Age-Friendly Cities were conceived and developed by the World Health Organisation (WHO) in 2005. Age Friendly Ireland helps cities and counties to be more inclusive of older people by addressing their stated concerns. The Programme seeks to create public meeting places for older adults (including health and fitness programmes for healthy living) and to expand existing walking trails with input from the Older Peoples Forum (Outdoor Spaces & Buildings). A postivite feature of Age Friendly Cities is that it successfully uses a multi-organisational approach (Local Sports Partnerships, Health Services Executive Health Promotion Department and Coordinator of Older Peoples Services) to liaise with leisure services providers to implement the GP Referral Scheme[1], taster sessions in PA and information for interested older adults.

2.8.3 Age & Opportunity

Age and Opportunity is the Irish national organisation that runs programmes and events for older adults across three different strands - Physical Activity & Sport; Arts & Culture and Education & Engagement. Partnerships are formed with local organisations such as

[1] Exercise Referral programme sought to integrate the promotion of physical activity into care pathways across the health services. Participants are referred to suitable programmes by their GPs and other healthcare professionals. In 2014, a proposed National Exercise Referral Framework developed by Dublin City University was published.

Vocational Educational Committees, Local Sports Partnerships, libraries, arts centres. Age & Opportunity administer Ireland's national sport and physical activity programme for older adults, *Go for Life*. The *Go for Life* games involve the National Games (held annually), Leagues and Friendly games where the emphasis is on participation, fun and non-competitiveness. *Go for Life* also conducts FitLine, a free, telephone-based service that encourages older adults to become more active and gives information about clubs, groups and facilities in the area. This successful programme uses volunteer older adults who are trained to motivate and encourage older adults to be active. The FitLine has had an impact evaluation carried out which found that the pilot scheme increased knowledge and particpation in physical activity among participants and mentors (Age and Opportunity, 2010). *Go for Life* also seeks to help older adults to lead their own activities in their own areas and to facilitate this, it provides a programme for training older adult Physical Activity Leaders (PALs). These are older adults who are already part of a group or club and are willing to lead activities. PALs lead their local group (Active Retirement, sports club, Irish Countrywomen's Association) in things like short exercise routines and fun games. To further local area initiatives, in conjunction with Sport Ireland, they administer a small grant scheme for the promotion of locally-developed, well-planned initiatives designed to increase participation in recreational sport and physical activity by older people.

2.9 Interventions to increase PA in older adults

The previous section has reviewed the individual, interpersonal, socioenvironmental and policy factors which shape older adults PA. These factors can be used to help plan interventions at these multiple levels. PA interventions targeted at the individual level in the literature are typically underpinned by theories emanating from social psychology. The most commonly used are Social Cognitive Theory (SCT) and the Trans Theoretical Model. Both of these theories are used to guide some of the interventions in the current work and are reviewed briefly in the following section.

2.10 Social Cognitive Theory

Self–efficacy refers to an individual's perception of their ability to complete a task or reach a goal. It is the main concept of Bandura's Social Cognitive Theory (SCT). SCT suggests that outcome expectation, self-efficacy and social support are causal factors of behaviour change. The theory concentrates on the importance of observational learning and suggests that there is a continuous interaction between behaviour, personal factors and the environment (Bandura,

1986). White et al. tested the SCT model of PA behaviour in a study of 321 older adults. Participants in the study completed measures of self-efficacy (six-item Exercise Self-Exercise Scale), outcome expectations (fifteen-item Multidimensional Outcome Expectation for Exercise Scale), physical activity (the Physical Activity Scale for the Elderly PASE) and disability limitations (eight-item disability limitation subscale of the abbreviated Late Life Function and Disability Instrument) both at baseline and follow-up. It was found that self-efficacy influenced PA participation via physical outcome expectations and social outcome expectations. Results from this study supported the use of SCT as proposed by Bandura (2004) to promote physical activity in older adults (White, 2012).

2.11 The Transtheoretical Model

The Transtheoretical Model (TTM) (Prochaska & DiClemente, 1983) was initially used in research into addictive behaviours such as smoking and explored how people made change without professional intervention. It is a biopsychosocial model which conceptualises the process of change in individuals. The five stages are: *Pre-contemplation* – a person may be unaware of and subsequently avoid any lifestyle change. As such they will not place any value on the benefits that may come as a result of becoming more active. *Contemplation* – at this stage of change a person may have a realisation of the benefits of change. They may be thinking about changing behaviour but procrastinating. *Preparation* – now the person intends making change and will be taking action (buying sports equipment or enquiring about exercise classes). They will have observed others and may even tell those close to them that they intend making changes. *Action* – at this stage the person has made change and is physically active but at this stage it is usually for less than 6 months. *Maintenance* – the person now has a new lifestyle which has been maintained for more than 6 months. Linear progression through the stages seldom happens and relapse regularly happens when progressing to the maintenance stage. The model is relevant for changing behaviour in patterns of physical activity. Kosma (2016) examined the connections between motivational aspects from the TTM, physical activity and falls risk in a diverse group of 170 older adults. The study concluded that a combination of PA, confidence improvement and application of TTM can enhance falls risk prevention (Kosma, 2016). Similarly in Lach et al. (2004), TTM enhanced the Health Stages health promotion programme by providing a design framework to help reach a wider cohort of older adults. TTM constructs (self-efficacy, decisional balance and process of change) were incorporated into the Health Stages curriculum (Lach, 2004).

2.12 Recruitment of older adults to physical activity

The community is a good place to promote physical activity for older adults. The Groningen Active Living Model (GALM) is an example of a successful community physical activity intervention using a tailored approach in behavioural change strategy to recruit underactive and sedentary 55-65 year olds. As of 2005, 552,094 people in 424 projects have been approached to take part (Stevens, 2008). Its success is due to the fact that it has succeeded in reaching 12.3% of potential participants of whom 79.4% were deemed sedentary or underactive. Recruitment to the programme was done using population and network strategy. Written invitations were issued and a home visit by trained employees. During the home visits screening of participants was done using a questionnaire based on the American College of Sports Medicine (ACSM) recommendations (Haskell, 2007). Follow up home visits were made to those who were absent first time and all potential participants were invited to bring somebody along (Stevens, 2008). Participation rates in GALM were in line with similar studies (Lifestyle Interventions and Independence for Elders (LIFE-P) (Rejeski, 2005) and Perth Active Living Seniors Project (Jancey, 2006). However, because GALM offered a recreational sports activity, it had a more even distribution of men and women. Perth Active Living Seniors Project, on the other hand, offered participants the opportunity to join a walking programme only and this was more attractive to women and ultimately less expensive to run. LIFE-P was a multi-centre, clinical trial comparing a physical activity intervention versus health education measures in sedentary older adults aged 70 to 89 years and cost $439 to recruit one person. This compares with $30 for Perth Active Living Seniors Project (Jancey, 2006) and $84 for recruiting one person to the GALM project (Stevens, 2008). This shows the varying cost of recruiting older adults to any physical activity programme. Even though GALM was more expensive to implement it had better programme offering and hence a better distribution of participants.

Mass media campaigns have been used to deliver messages that promote physical activity and its benefits in order to influence behaviour change for over 30 years (Craig, 2009). In a meta-analysis conducted in the United States (Snyder 2002), it was found that mass media campaigns had a positive effect on PA behaviour change (r =.09). The average campaign changed behaviour of about 8% of the population, in a positive direction in the short term. There is likely to be a greater effect for short term behaviour adoption than there is for long term behaviour modification (Snyder, 2002). Mass media campaigns are an important first step in raising awareness when promoting a change in PA behaviour. The effectiveness or

impact evaluation of mass media campaign is gauged by measuring the effects on the target population via campaign and message awareness. However, it is also important to assess if it increased understanding and changed attitudes towards the new physical activity message (Bauman, 2006). Brown et al. (2012) (Community Preventive Services Task Force) found insufficient evidence for the effectiveness of the many varied standalone mass media campaigns aimed at increasing physical activity. Furthermore, Brown suggests that there is a need to examine the cost effectiveness of such campaigns. Moreover, the systematic review by Brown and colleagues suggests that it is not clear if mass media campaigns really reach the groups in most need. Consequently, extensive further studies are needed to ascertain which media channel is most suitable to which section of the population (Brown, 2012). Their conclusion was that when trying to increase awareness and knowledge around the benefits of PA, mass media campaigns are possibly better used as part of a community wide, multi component intervention rather than the only method. When used this way they have a greater chance to change attitudes and norms (Brown, 2012).

2.13 Planning and evaluating older adult PA programmes using logic models and RE-AIM

One of the biggest challenges facing health promoters is not just how to design effective evidence-based physical activity programmes, but how to evaluate these programmes and translate those into public health practice (Van Acker, 2011). The World Health Organisation says that systematic evaluation of programmes is crucial in order to provide information for others who may wish to replicate the programme effectively (WHO European Working Group, 1998). It is essential that multilevel interventions which target environmental, individual and policy change levels include an evaluation component, if they are to fully meet their goals (Glasgow, 1999). Evaluation frameworks are used to guide those appraising programmes and are always programme specific in that they need to take account of the origins and context of the programme being evaluated because there is no ‘one size fits all’ evaluation design (Kahan, 2008). However, many large scale health promotion programmes do not use prospective evaluation in their planning process (Kozica, 2015). In a review of health promotion evaluations, Kozica et al. found that concepts such as key objectives, target audience, data collection methods, programme level and evaluation all require serious consideration before setting out to design a health promotion or physical activity programme. They further argue that programme evaluation should be obligatory, not optional.

When evaluating a programme, one of the major problems can be the lack of clarity about how planned or anticipated project activities relate to the delivery of project goals. To this end using a Logic Model provides a clear pathway in programme planning, delivery and evaluation (Kellogg, 2004). Logic Mapping shows what is about to happen and why it should happen, the criteria for measuring success, ways of identifying what went wrong and finally, what to improve on or remedy. This can lead to more efficient use of resources (effort, staff time and funds). Logic mapping, which is a visual representation of the various elements of the study, was used as a framework for enhancing the focus and robustness of evaluation activities. This approach is particularly recommended as part of a 'theory based' or 'Theory of Change' approach to evaluation (Bartholomew, 1998). Logic mapping helps develop clarity about the issues being addressed and the context within which the interventions take place:

-*Inputs* – resources and activities required in order to achieve intervention's objectives

-*Outputs* - target groups to be engaged, programmes developed;

- *Outcomes* - short and medium-term results,

- *Impacts*- improved health, environmental benefits and changes to organisational practice; plan and evaluate a number of interventions / initiatives (Innovation Network Incorporated, 2014).

Developing a Logic Model (see Figure 3) at the proposal stage helps to provide a documented "roadmap" for the researcher. From an evaluation point of view, the logic model is a robust framework that provides information on project progress. To summarise, a logic map is a clear, graphical representation of the project (Hill, 2010).

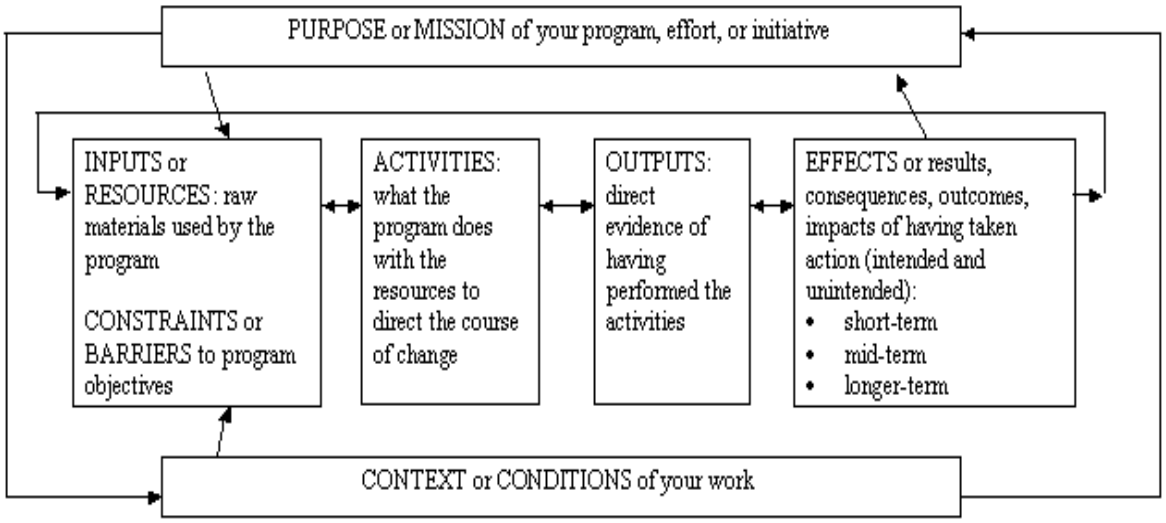

Figure 3*. The Logic Model (Kellogg Foundation, 2004).*

2.14 RE-AIM framework

Whilst the Logic Model shows the relationships, inputs, activities, outputs and outcomes as well as criteria for success, a more appropriate method of reporting results of health promotion programmes is the RE-AIM framework. Whilst The RE-AIM framework was originally used as a method of consistently reporting research results (Glasgow, 1999), the framework was subsequently expanded and used by Glasgow and colleagues to organise literature reviews on health promotion and disease prevention across various settings (work, healthcare, school and community). The acronym RE-AIM stands for Reach, Effectiveness (at individual level), Adoption, Implementation (at organisational level) and Maintenance (at individual and organisational levels). It offers a structured way of systematically appraising the strengths and weaknesses across the five dimensions in the evaluation process. It also assists to fill the translational gap between research and practice (Glasgow, 2001) which is of particular importance where the intention is to effect change. When conducting the evaluation process, it was found that, quite often, key internal and external factors that impacted on the programme outcomes were not reported and this brought into doubt the representativeness or robustness of some study results (Glasgow, 2004). RE-AIM has more recently been used as a tool to help initially in programme planning, with a view to improving the chances of a programme ultimately translating into real-world settings. RE-AIM consists of five elements and these characterise the impact of a programme. For maximum benefit the programme should perform well across all elements. A weakness in any of the elements will affect the programme adversely (Belza, 2007). These five elements are now explained.

2.14.1 Reach

The Reach element of a programme is the extent to which a programme attracts and retains the target audience in terms of numbers and programme attrition or completion. These factors can help measure the success of recruitment and retention methods (Ory, 2015). When trying to maximise Reach, further factors to consider when recruiting to a programme are:

Cost – the extent to which the target audience can afford or value the programme.

Access – the extent to which the target audience can access the programme (time, day and location).

Perceived benefits – how will those for whom the programme is intended recognise any benefit(s) or deem it worthwhile to take part in the programme?

Familiarity – ease of engagement with the programme in a familiar setting as opposed to new venue for those for whom it was intended.

Programme supports – the extent to which all abilities are supported in the activity and future pathways or progress to other groups (Belza, 2007).

The *Fit and Strong!* programme is an evidence-based programme developed for older adults (60+) with osteoarthritis (OA) and is an example of how the ***reach*** component of the RE-AIM framework can be analysed. OA can lead to loss of independence and, ultimately, disability (McDonough, 2010). The programme, which was developed in Chicago, worked with multiple agencies across the city to maximise recruitment. An example of how the REACH was calculated shows that the total number of older adults in Chicago was 286,912. Of this, it was estimated that 60% (172,147) have OA. From this 50% (46,440) of these are estimated to have OA in the lower extremities. A total of 700 of these were recruited to the programme giving a REACH of 1.5% (700/46,440=1.5%). While these numbers may seem small, the programme was new and the hope was that it would ultimately reach a significant proportion of older adults with OA (Belza, 2007).

2.14.2 Effectiveness

Effectiveness is assessed by measuring any improvements and any impact on quality of life for participants. For example, a programme that sets out to meet the PA guidelines as its outcome may be deemed effective if participants achieve daily physical activity guidelines at

programme conclusion. Adverse consequences such as a decrease in PA would also need to be reported. The EFFECTIVENESS of the *Fit and Strong* programme had previously been established in previous research in senior centres. Older adults showed significant improvement in muscle strength, overall health and reduced falls. *Fit and Strong* measured EFFECTIVENESS of the dissemination by assessing quality of life, health status, attendance and overall PA levels (Belza, 2010).

2.14.3 Adoption

Adoption is assessed according to and within the setting in which the programme is delivered. Factors measured are organisational capacity (resources and funding), participation rate among potential settings and the degree to which these settings are representative of the target population. It is important to be able to match settings, locations, resources and funding to the programme aims in order to be able to deliver the programme to scale and to the right audience (Ory, 2015). When calculating Reach and Adoption, the number of eligible individuals or settings is used to calculate participation rate. For example, falls are the leading cause of hospitalisation and injury in older adults in Maine. A *Matter of Balance* (MOB) is an evidence-based programme established to promote PA and reduce fear of falling in older adults. MOB's ADOPTION strategy included a request throughout the implementation stage for various organisations to become master trainer sites which would, in turn, recruit volunteer leaders to train local leaders. The leaders would guide the classes, recruit participants and evaluate the programme. The intensive request for partners enabled MOB to find sites that were willing and committed to adopt the programme at local level. Adoption was promoted by ensuring good facility facilities and equipment; excellent leader training including certification and insisting on two instructors per class (Belza, 2007).

2.14.4 Implementation

Implementation assesses the fidelity of delivery of the various components of a programme both at setting and individual level. Any deviation from agreed protocols can adversely affect the programme outcome. Implementation gives delivery guidelines for staff and degree to which a programme may be adapted or modified (Ory, 2015). Measures of this level identify not just areas that need to be improved, but also assess the extent to which results can be attributed to the programme (Ory, 2015).

Enhance Fitness (EF) (Petrescu-Prahova, 2017) was established to promote flexibility, balance and strength, thus leading to older adults living more independent lives. The

evidence-based programme used trained fitness instructors to lead classes thrice weekly. EF provides an IMPLEMENTATION support package for its instructors to maintain its core elements by educating the instructors in how the lead a class, conduct fitness checks, motivational interviewing, maintain data (health history, attendance) and online technical assistance (Belza, 2007).

2.14.5 Maintenance

Maintenance at individual level measures long term effects of the programme on targeted outcomes. At setting level it assesses whether the programme has been sustained, modified or discontinued; the extent to which it has become organisational practice (Ory, 2015). Maintenance can improve programme retention and programme sustainability. Belza (2007) suggests that six months maybe the ideal time to measure effects of the programme but each programme is different (Belza, 2007). *Active for Life* is a research-based community PA promoting programme for midlife and older adults affected by sedentary lifestyles. Programme Maintenance is assessed in year 1, 3 and 4 using self-report surveys of PA levels, health related issues and quality of life themes. Active for Life works with community groups to MAINTAIN programmes by establishing partnerships, working with community leaders and 'programme champions', residents, social workers and church links. The programme is also independently evaluated by the University of South Carolina (Belza, 2007).

To conclude, using the RE-AIM framework can help to determine successful characteristics of interventions that can reach large numbers of people and be widely adopted by various settings. It can also assess if the intervention can consistently be implemented by trained staff to produce long-lasting and reproducible effects at a reasonable cost.

2.15 Conclusion

In conclusion, this literature review has emphasised the importance of PA for optimal health for older adults. PA can help to slow down, reduce and prevent much of the functional decline associated with aging and is also essential for the maintenance of physical, cognitive and emotional health (Bethancourt, 2014). The majority of Irish older adults are not sufficiently active (Cronin, 2011). However, one of the biggest challenges is recruiting them to physical activity programmes but programmes such as GALM (Stevens, 2008), have been successful in recruiting older adults in a community setting. The older adult population is increasing in size and those aged over 65 years will represent 19% of the population by 2031 (Centre for Ageing Research and Development in Ireland, 2009). Older adults are a very

diverse group and Spirduso (2005) suggests that they be categorised as ‘young old’ (65-74) up to the ‘oldest old’ (100 years +) (Spirduso, 2005). The Social Ecological Model (SEM) can be used to understand the determinants of health. It is a model of health that emphasizes the linkages and relationships among multiple determinants affecting health (Sallis, 2008). When evidence based PA programmes are devised and successful it is important to disseminate them. However, there is insufficient research on wide-scale dissemination of such programmes (Van Acker, 2011). The RE-AIM framework has been used successfully for quantitative, real time tracking plus retrospective evaluation of PA programmes (Forman, 2017). Chapter 3 will describe the methodology used in the study and this will be followed by the results and discussion chapters.

2.16 Aim of this Study

The aim of the study is to identify barriers to and facilitators of PA participation in older adults and to develop and facilitate the implementation of interventions at multiple levels to promote increased and sustainable levels of PA in a range of settings.

2.17 The Research Questions

The Research Questions are:

1. What levels of physical activity are currently being achieved by older adults?

2. What are the perceived barriers and facilitators to older adult participation in physical activity?

3. What activities / strategies would older adults like to see implemented to help them achieve the optimal physical activity guidelines?

4. What was the impact of the physical activity interventions in increasing physical activity participation among the study participants?

3 Methodology

3.1 Introduction

The aim of the study was to identify barriers and facilitators to participation in PA among older adults in Ireland for the purposes of developing and facilitating the implementation of interventions at multiple levels aimed at promoting increased and sustainable levels of PA across a range of settings. These strategies were then assessed for their effectiveness and the results were used to make recommendations for the future planning of physical activity interventions for older adults in Ireland.

3.2 Research Design

The study used a two phase methodology process as outlined in Figure 4.

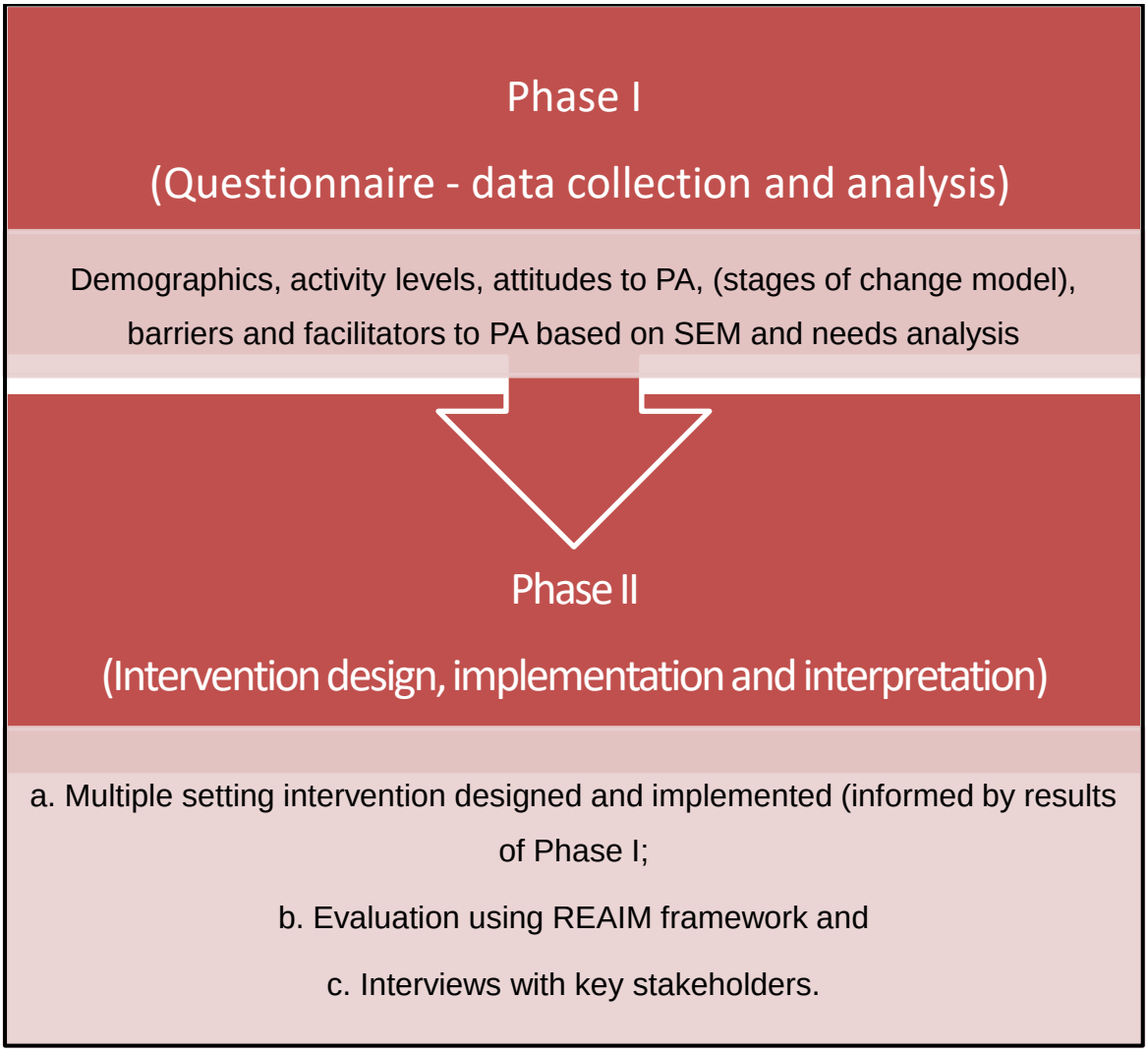

Figure 4. *Research outline.*

In Phase I data was collected from older adults during March 2015. The aim of this Phase was to assess current levels of PA among the sample population of older adults. A self-developed multiple-section questionnaire was used. The main advantage of using a questionnaire is that it is a relatively quick way of collecting data from large groups (Moser, 1979). A disadvantage is that respondents do not have the opportunity to expand on the topic. Another disadvantage is that there may be a tendency for people to present themselves in a favourable light by answering in a certain way (especially so in health related matters) which is called socially desirable responding (SDR) which could be a bias to the results (van de Mortel, 2008). An analysis of the questionnaires from Phase I informed the direction of Phase II. Following consultation with stakeholders in a variety of settings, a series of interventions were developed and implemented. Pre and Post questionnaires were administered to those who took part in the interventions (n=45). Analysis of interventions was conducted using the REAIM framework (Glasgow, 1999). Additionally, qualitative interviews were conducted with stakeholders (n=5) to further examine enablers and barriers to implementation.

3.3 Social Desirability Responding (SDR)

When using questionnaires, it is difficult to overcome SDR completely. However, limiting choice of response in questionnaires and self-administration of the questionnaire can help somewhat. Assuring respondents that their answers will be treated in confidence can also help eliminate social desirable responding (Nederhof, 1985). Using questionnaires for the purposes of data collection depends highly on the subjects' perception of the study. For two decades, the many benefits of physical activity have been widely published. In addition to this the results of studies about health behaviours are becoming widely available which means that subjects might be inclined to over report levels of physical activity, thus introducing the possibility of social desirability bias. Also, the interviewer can potentially influence the subjects by the way the questionnaire is administered, even more so, if there is the prospect of a physical activity intervention being introduced (Katzmarzyk, 2007). To try to overcome social desirability bias the questionnaires were self-administered. Participants were guaranteed that any information collected would be confidential and they were also given the option to remain anonymous.

3.4 Physical activity measurement in older adults

Physical activity surveillance methods have improved with the development and introduction of the international physical activity questionnaire (IPAQ) as a common instrument for the

comparison of levels of physical activity (Hallal, 2012). However, the IPAQ uses self-report and it has been suggested that consideration should be given to the validity of self-report. Self-report often does not include low level PA, short bursts of PA and household PA (Van Cauwenberg, 2011).

The results of data analysis from Phase I questionnaires informed the direction of Phase II of the study. An effort was made to from interventions that addressed the barriers that emerged from the results of Phase I. For example lack of walking groups – three of the interventions had walking as part of the programme. Also, PA was provided for retirement groups that had no PA element to their activities previously. Older Adults expressed apathy to gym membership and cost of PA. To address this barrier, a fitness facility was recruited to provide gym activities for older adults at a reduced rate. Phase II intervention was named *Get Active NOW!* Following analysis of data from Phase I of the study, venues for the interventions were recruited through a series of collaborations with stakeholders (key people in rural and urban community groups, local leisure centre and family resource centres).

Under the *Get Active Now* programme, these interventions took place in November / December 2015. The RE-AIM frame work was then used to evaluate these interventions and report the results. Following this, qualitative interviews were held with key stakeholders to elicit their feedback on the interventions. Figure 4 above outlines the stages of the research.

3.5 Mixed Methods

Using quantitative methods in research involves objective measures, statistical and numerical analysis of data and generalising it across groups in order to determine relationships between variables within a population. Quantitative studies can be *descriptive* (participants are measured once) or *experimental* (using pre and post treatment) (Babbie, 2010). Quantitative research usually means using closed ended questions, an example of which would be census questionnaires. Phase I of this study was quantitative and a questionnaire was used to elicit descriptive and inferential statistics.

Qualitative research methods, on the other hand, are more suitable for exploring feelings, opinions and attitudes to a particular topic and are done via direct meetings with subjects (focus groups). Such groups are useful when conducting research to understand a particular behaviour and where there are limited research resources. According to Creswell (2003), qualitative research uses open ended questioning which allows participants express answers

and feelings in their own words (Creswell, 2003). The results can then be merged or triangulated to form a more complete picture of the problem than either of them would when used on their own, thus offsetting any weaknesses of both methods (Creswell, 2003).

3.6 Triangulation

A mixed methods (triangulation) approach was used to conduct this research. When using qualitative or quantitative methods on its own fails to encapsulate the subject matter completely, a combination helps give a more complete analysis (Tashakkori and Teddlie, 2010). Triangulation was first applied to research by Campbell and Fiske (1959), who argued that research should use more than one method to measure variables. It may be used to give a more robust account of research and facilitate deeper understanding. Patton (1999) and Denzin (1978) who were major proponents of the method identified four types of triangulation and two of these, which were used in the research, are summarised in table 3.

Type	Method	Characteristics
Methods triangulation	Explores reliability of findings produced by different data collection methods	• Uses qualitative and quantitative data • Elucidates complementary aspects of same phenomenon • Divergent points can provide points of interest to the researcher
Triangulation of sources	Examines consistency of different data sources within same method (stakeholders, staff)	• Different time points • Private / public settings • Compares different viewpoints (agreement and divergence)

Table 3. *Triangulation methods as identified by Patton (1999) and Denzin (1978).*

At Phase II of this study, *Triangulation of Sources* was used. *Triangulation of Sources* is most suited to studies that use different time points (Phase I and Phase II) and that have

stakeholders viewpoints to consider. Results from the evaluation of the interventions (using the RE-AIM framework) were triangulated (compared with) viewpoints of the key stakeholders (qualitative) and the quantitative results of the Pre and Post data from participants in the interventions. This helped to give a more comprehensive explanation of the study.

3.7 Data Protection

All the information collected in the study, including the identity of groups and facilities visited, remained unidentifiable and confidential and were viewed only by the researcher and his supervisors. The data (written and recorded) was password protected and stored in a secure area at Waterford Institute of Technology Postgraduate Area. Confidentiality of participants was assured by assigning each participant a number and the participating venue from which they were recruited was assigned an alphabetic code. The code only referred to the background from which they came (active retirement group, GAA member, community group, fitness facility etc.). For example the code name GAA1 was given to the first participant from a GAA club; GYM2 was given to a gym member and so on. These codes were then kept in a secure area at Waterford Institute of Technology. The groups and facilities in the study will remain unidentifiable. The Data Protection Act 1998 exists to protect an individual's privacy in such matters. It was made known to all the participants too, that they had the right to drop out of the study at any stage (interview, focus groups or intervention) without penalty.

3.8 Setting for the Study

Kilkenny is a county in the south east of Ireland and has a land area of 2,073 km^2. Census 2016 showed a population of 99,118, an increase of 3.9% from the previous (2011) census. This was a similar increase to other areas in Ireland. Over the five years from Census 2011 to Census 2016, there was an increase of 20.2% in the number of people aged 65 years. At the time of this study, the population of the county was 95,419 and of this, 11,690 persons (12.2%) were aged 65 years and over (Central Statistics Office, 2016). The Pobal Haase-Pratschke Deprivation Index (HP Index) is a measure which is used by the Central Statistics Office in Ireland to measure affluence or deprivation levels in Ireland (Haase, 2012). With a score of -1.01, Kilkenny scores marginally below the national score. It also fares better on the HP Deprivation Index Score than its immediate neighbouring counties Carlow (-3.41) and Waterford (-4.51). Kilkenny is also above average for the South East region and deemed

the most affluent local authority area within the region where the Deprivation Index score is -2.51. Mean index scores fell dramatically in Ireland between the 2006 and 2011 Census in conjunction with the economic decline but have since recovered.

3.9 Study Sampling

The study used a convenience, stratified, representative sample of community dwelling older adults in Ireland. For Phase I, the sample size of 300 participants was stratified according to age, urban and rural location, gender, and PA level (high, medium or low / inactive). Stratifying the sample helps achieve representativeness which means that the sample accurately represents the group being studied (Teddlie, 2007).

3.10 Study population

There are many definitions of the term 'older adult' According to the World Health Organisation (WHO, 2013), older adult is defined as those aged over 65 years or those receiving a pension. For the purposes of this research, older adult was defined as those over 50 years, a definition adopted by the Active Retirement Network of Ireland (Active Retirement Network Ireland, 2009). Their rationale for this is 'the age when people are most likely to take up retirement or semi-retirement and it can be a point in people's lives at which their circumstances begin to change in ways that have implications for the future' (p.3, Active Retirement Network Ireland, 2009). Only people over 50 years were included in Phase I and Phase II of the study. The interventions were advertised through Mass Media campaign. Those that took part in Phase I were asked if they would like to be part of any intervention that might arise from the study and were invited to provide contact details for this purpose. Some participants from Phase I (questionnaire) took part in Phase II (the interventions). Most of the 65 participants were not part of Phase I.

3.11 Recruitment to the study

Recruitment to Phase I of the study (February / March 2015) was done by making contact with local fitness facilities, church and charity groups, bridge clubs, active retirement groups, and those attending activities organised by Local Sports Partnerships (LSP), community groups, members of local GAA clubs (former players, male and female and officials), Men's Shed members, family resource centres, Irish Countrywomen's Association (ICA) Choirs, and members referred from Primary Care (General Practitioner) to get as representative a cross-section of community-dwelling older adults as possible. Letters of introduction were drafted and sent to the key personnel in each of the organisations requesting permission to

visit the group and distribute questionnaires (see Appendix A). The purpose of the letters were to introduce the researcher to the organisation; outline the nature and structure of the study; highlight the option for group members to opt in or out of the study; and finally the guarantee of confidentiality for each potential participant.

Recruitment of participants to take part in Phase II, *Get Active NOW!* (the physical activity interventions which took place in November / December 2015) was done through articles in local newspapers, erecting posters in community centres, the fitness centre and family resources centres. Participants from Phase I were also invited to take part by providing details at the end of the questionnaire. Prior to commencement of physical activity, participants completed a physical activity readiness questionnaire (PARQ) form. This is a means of screening them for their readiness to take part in a low to moderate intensity PA programme (Jones, 2005). Those with contraindications for physical activity and those answering YES on any of the questions on the screening PARQ form were not allowed take part.

Phase I of the study also informed the recruitment of the settings. For example, apathy to gym membership (and cost of) prompted recruitment of a fitness facility known to the researcher. Differences in urban and rural levels of PA prompted selection of both urban and rural settings that were open to having PA programme for members. All the setting stakeholders approached by the researcher were willing to facilitate the programmes. Programmes offered to the setting stakeholders were based on the results of Phase I and are presented in Table 13 of the Results Chapter.

3.12 Informed consent

For Phase I, the researcher contacted and met with all groups and individuals in order to recruit them and informed them clearly of the purpose of the study. Consent was requested from individuals who were not members of any group for permission to speak to them about the study. Where groups had a committee structure, consent to speak with potential participants from group was sought by a process of dialogue with the committee. The researcher visited each of the groups / settings and sought individual informed consent to take part in Phase I of the study from each participant. Participants who wished to take part signed a document *Informed Consent for Participation in Research* (see Appendix B). Participation was strictly on a voluntary basis. Participants were informed of their right to drop out of the study at any time. Unwillingness to participate in the study (whether verbal or unspoken) was recognised and respected. Advice was given to any participants who dropped out of the study

to encourage participation in physical activity. In the case of illiteracy, plans were made to get oral consent by audio recording as per WHO recommendations, however in this study the need did not arise (World Health Organisation Research Ethics Review Committee, 2015).

At Phase II of the study, participants were invited to take part in the interventions. The nature of the intervention was explained to them and they were asked to complete a consent form prior to undertaking any PA. Following this, they were also invited to complete Pre and Post Intervention questionnaires at the appropriate time. Again, any unwillingness to complete the questionnaires was recognised and respected. For the stakeholders' interviews, the same rights were recognised.

3.13 Instruments

Questionnaires

For the quantitative element of Phase I of the study a questionnaire was drafted. Phase II questionnaires were an amended version of Phase I and were used to assess PA levels pre and post intervention. The main advantage of using a questionnaire is that it is a relatively quick way of collecting data from large groups (Moser, 1979).

Questionnaire Development

The self-report questionnaire had 7 sections. The questions requested responses in different formats: dichotomous answers (yes/no; agree/disagree); 5 point Likert scale and multiple-choice. The questionnaires used in Phase I and Phase II are contained in *Appendices J, K. and L.* The following describes the content and structure of the questionnaires.

3.13.1 Participant Demographics

(Section A, questions 1-5). Participants were asked to provide their address location (town / rural); sex and age (personal level of Socio-Ecological Model).

Research Question 1: What levels of physical activity are currently being achieved by older adults? They were asked if they have access to a car for transport and also what their current occupation status is as research shows that these both influence physical activity levels in older adults (Bannister, 2004).

3.13.2 Physical activity

(Section B, questions 6-14). Research Question 1: What levels of physical activity are currently being achieved by older adults?

Participant's knowledge of physical activity guidelines was assessed by asking participants to estimate in minutes per day or minutes per week the minimum amount of moderate to vigorous intensity physical activity that adults should perform to gain health benefits. Participants were also asked to rate their own level of physical activity compared to others of same age and gender (interpersonal level of Socio-Ecological Model). This section also set out to measure the variable of physical activity levels, and used the shortened International Physical Activity Questionnaire (IPAQ) short form which has been extensively tested for reliability and validity in 12 countries across 6 continents (Marshall, 2001). Participants were asked about their behaviour in a typical week and the past week as there may sometimes be a difference. Question 10 asked if they had undertaken any muscle strengthening activities in the past week. Question 11 addressed travel methods. Participants were asked about usual travel methods to shopping, for visiting family/friends and also for travel to leisure time activity. Finally, questions 12 and 13 asked about group or organisation membership (sports club, community group, gym, active retirement association, workplace social group etc.). Participants were asked to name the group and also the type of physical activity that was offered by the group. Finally, question 14 asked if they had purchased home exercise equipment recently.

3.13.3 Readiness to change

(Section C, questions 15-19). Research Question 2: What are the perceived barriers and facilitators to older adult participation in physical activity?

This section addressed readiness to change - Stages of Change model which states that people pass through a series of changes (pre-contemplation, contemplation, preparation, action, maintenance, relapse) when change happens (Prochaska, 1984). It was used, on a personal level, to measure the perceived importance of physical activity to participants and their intention to change. The questions were based on self-efficacy and the stages of exercise behaviour change (Marcus, 1992). Dichotomous answers (Yes / No) employ a scale of measurement which is nominal (categorical). An advantage of dichotomous questions is that they are easy to comprehend and they are short. This can lead to greater completion rates (Brown, 2011).

3.13.4 Environment / Neighbourhood

(Section D, questions 20-26). Research Question 2: What are the perceived barriers and facilitators to older adult participation in physical activity?

This section addressed the environmental element of Social-Ecological (SEM). The SEM helps to understand multiple levels of influence on physical activity (individual, interpersonal, organisational, community and policy) and how our behaviour is affected by the social and physical environment. The questions addressed: perception of the neighbourhood and environment in terms of infrastructure safety and appeal of the environment; proximity of facilities; attitudes to gym/gym membership; and active transport facilities. They are based on the Neighbourhood Environment Walkability Scale for Youth (Rosenberg D. D., 2009) which measures neighbourhood, environment, recreation facilities, walking and cycling facilities and had acceptable test-retest reliability. The questions offered a validated 5-point Likert scale for answers (Vagias, 2006).

3.13.5 Enablers to physical activity

Section E, question 27). Research Question 2: What are the perceived barriers and facilitators to older adult participation in physical activity? Research Question 3: What activities / strategies would older adults like to see implemented to help them achieve the optimal physical activity guidelines?

In order to plan physical activity intervention activities for Phase II of this study, Section E asked participants to nominate factors (from a selection of ten), which might help them to increase their levels of physical activity. They were asked to indicate their own choice(s) via a dichotomous (yes/no) answer. Questions are based on *Physical activity participation among persons with disabilities: Barriers and Facilitators* (Rimmer, 2004).

3.13.6 Attitudes to physical activity

(Section F, questions 28 – 33). Research Question 2: What are the perceived barriers and facilitators to older adult participation in physical activity?

Attitudes to and perception of physical activity were explored, on a personal level, via a series of statements (yes/no answer) in Section F Questions in this section were taken from the validated Determinants of Physical Activity Questionnaire (DPAQ). This looks at a person's beliefs about capabilities, motivation, skills and personal barriers to physical activity (Taylor, 2013).

3.13.7 Personal factors

(Section G, questions 34-40). Research Question 2: What are the perceived barriers and facilitators to older adult participation in physical activity?

The final part of the questionnaire, based on the Intrapersonal domain of the SEM (Bronfenbrenner, 1979), asked for a response (agree/disagree) about which personal / individual factors were likely to keep them from being physically active (Sallis, 2008).

Area of Investigation	**Variable**
Current levels of physical activity	PA levels compared to peers Knowledge of PA guidelines How they access: • Shopping • Family, friends • Travel to leisure activities Membership of clubs and what PA these clubs provide Investment in home exercise equipment recently
Perceived barriers/facilitators to physical activity	Readiness to change Intention to become more physically active Value placed on PA Regularly active or not? Environmental factors Motivation levels Attitude to PA Personal factors
Facilitators / strategies that might increase PA	Personal Interpersonal Environmental

Table 4. *Summary of Research Questions (left hand column) and outcome variables investigated.*

3.14 Further participation

Finally, participants were asked to submit contact details if they were interested in taking part in any of the planned physical activity interventions associated with Phase II of the study.

3.15 Piloting the questionnaires

Pilot studies are an important component of good study design. They increase the likelihood of, but do not guarantee success for the main study (van Teijlingen, 2001). Prior to use, the questionnaire was piloted on a representative sample of 12 older adults (various age, urban and rural location, gender, and various PA levels). This helped determine prospective participant's ability to adequately understand and complete the questionnaire. The pilot studies helped to highlight a number of typographical and layout errors and these were amended before printing. The pilot study was useful in helping to estimate the time required to complete the questionnaire. This assisted with the logistics of planning the administration of the questionnaire to groups

3.16 Questionnaire Administration

Research with older adults has some methodological challenges related to age, generational and social influences. Even though the research may benefit older adults, researchers must try to be sensitive and considerate when studying the older adult population (Chase, 2013) . Participants were assured that their names would remain anonymous and that there was no benefit to be gained from over reporting activity levels. The researcher distributed and administered 300 questionnaires in Phase 1 to the respondents either individually or in groups in the location where they were recruited (active retirement group, community centre, choirs). The researcher administered the questionnaires to the older adult participants both individually and as part of a group and remained with participants to help with any questions. This was to assist older adults who had vision or literacy problems. This ensured a full sample size and also ensured that all questions were answered. Having the researcher present helped eliminate the chance of a potential participant being excluded due to illiteracy or vision problems. Nobody >50 years was excluded from the study. The questionnaire was administered in quiet, well-lit areas of each setting. The researcher ensured that all participants were able to read and comprehend their questionnaire. The questionnaires were printed on non-glare paper in a sans serif font, size 12 for maximum legibility. No time pressure was put on participants to complete the questionnaire. Prior to administration of questionnaire a list of instructions for completion were read to participants (See Appendix C).

3.17 Intervention Strategies – Phase II

The content of Phase II of the study was determined by the results from Phase I. The strategy was to design, and implement, multiple setting interventions. They were designed with a view to boosting levels of PA in a meaningful and sustainable way for older adults in the study. Participants recruited in this phase were a mixture of those who indicated a willingness at Phase I (by ticking a relevant box on the questionnaire) to be part of an intervention and also those who became aware of the programme through advertising in the settings and through local media. The results from Phase I of the study included suggestions from older adults as to what they would like to see implemented to boost their physical activity – such as walking groups.

Some of the results from Phase I were shared with settings that provide physical activity such as a local fitness facility and also urban and rural community groups as a way of informing what activities would be offered in Phase II. Interventions were offered to settings based on facilities/venue availability, previous PA programmes in the setting and willingness of stakeholders in each setting to support the interventions. Consideration was also given to having urban / rural, affluent / disadvantaged areas included. Finally, a mixture of activities was included across the settings: walking; walking and chair based exercises; gym and spinning; and exercise class only. A comprehensive overview of the interventions undertaken is included in the Appendices (Appendix E). Details are given for each intervention under the headings: setting, type of intervention, dates intervention took place, times/days interventions took place, methods of recruitment, rationale for the intervention and also the evaluation method used for that intervention.

3.18 Evaluation and Appraisal

3.18.1 The RE-AIM framework

The REAIM framework was used as the overarching framework for evaluation (Glasgow, 1999). As already discussed in the Review of Literature, RE-AIM consists of five elements and these characterise the impact of a programme. For maximum benefit the programme should perform well across all elements. A weakness in any of the elements will affect the programme adversely.

Reach refers to the extent to which the intended population (representative sample of older adults) took part for the full duration of the intervention. Effectiveness refers to the extent to which the various interventions were successful in achieving the outcome (raising PA levels

to recommended guidelines); reducing perceived barriers to participation; facilitating participation in physical activity to a level greater than before the study; raising awareness and knowledge of PA among participants; being a conduit for behaviour change; and a vehicle for policy change in facilities and organisations. Adoption refers to the extent to the strategies were embraced by the various groups and settings and if these settings were representative of the population as a whole (staff and resources). Implementation considers the degree of fidelity to which the interventions were implemented in the settings. Finally, maintenance refers to the sustainability of the interventions over time (Glasgow, 1999).

The Logic Model (as a study planner) guided by the RE-AIM framework (for evaluation/appraisal) link well together. Inputs/Outputs (Reach, Implementation and Maintenance); Outcomes/Impact (Adoption, Effectiveness and Maintenance)

According to Belza (2007) when reach is strong and an effective programme is used there is a good chance of a successful intervention. However, if staff delivery of the programme is inconsistent (Implementation) or if the program isn't continued after its first year (Maintenance), the absolute impact of the work will be limited (Belza, 2007).

3.18.2 Stakeholder Interviews

Interviews took place with key stakeholders one week after the physical activity interventions ended in December 2015. The interviews were recorded on Sony Dictaphone with iPhone recording as back-up. They were transcribed verbatim using MS Word 2010 and hard copy of the transcriptions were read twice. On the third reading, summary codes were identified and noted in the margins. A basic coding hierarchy was created and this identified separate themes. The purpose of these interviews was to assess stakeholder involvement, expectations, delivery fidelity, and programme success, any plans for programme continuation or further promotion of physical activity in the study area. A 14 question topic guide was drafted. Phase I of the study sought to address Research Questions 1 and 2. Research Questions 3 and 4 were addressed from a stakeholder's perspective by this questionnaire. Research Questions 3 and 4 are thus:

3. What activities / strategies would older adults like to see implemented to help them achieve the optimal physical activity guidelines?

4. What impact the interventions had in promoting policy and procedural changes in the different settings investigated.

3.19 Data Analysis

3.19.1 Quantitative Analysis

All analysis of the quantitative data was performed using the Statistical Package for the Social Sciences (SPSS) for windows version 21. Each question was separately analysed. Descriptive statistics were generated using means, frequencies and percentages where appropriate. Figures and tables were presented to show this data. Inferential statistics were generated using non-parametric tests including Chi Square tests. Chi Square were used to determine differences between groups. For example, differences between groups such as males and females as well as differences between those living in urban and rural locations can be cross tabulated. Chi Square test can be used with any pair of single answer discrete questions such as demographics or Likert scales. The questionnaire used 5 point Likert scales. However, because of the small sample sizes, these were recoded to a 3 point scale – agree / strongly agree became agree and disagree / strongly disagree were recoded to disagree. Don't know remained the same. The data was subsequently treated as nominal data. Tables and graphs were generated in Microsoft Excel and Word and are presented in the Results chapter.

3.19.2 Qualitative Interviews

The stakeholder interviews were recorded andl were subsequently transcribed verbatim. Interviewees were assured that their identity would be kept anonymous. Pseudonyms were assigned to each one. Thematic Content Analysis was used to analyse the transcripts and identify pre-determined codes (from the prompts). All the codes were transferred to a separate document and developed into a hierarchy of codes and sub-codes. They were then compared to the data which emerged from the quantitative section and reported in the Results chapter.

3.20 Ethical Considerations

The data gathered for this study was concerned with the respondents' participation levels in physical activity as well as their attitudes and perceptions of factors affecting their participation in PA. The study did not involve any tests or experiments on human subjects or require subjects to disclose sensitive information. The research endeavoured to make a positive contribution towards the welfare of people and in so doing, respected the rights and dignity of the participants. Ethical approval was applied for, and granted, for Phase I and II of this study by the Research Ethics Committee in the Department of Health, Sport and Exercise

Science, Waterford Institute of Technology. Care and welfare of the older adult participants is covered later in this chapter (*(See Appendix N)* .

Chapter Conclusion

This chapter looked at the research methodologies used in this research and on why the researcher chose to use those methodologies. Questionnaires were used to gather data at Phase I. The information from these questionnaires informed the interventions in Phase II. Questionnaires were administered to participants in Phase II interventions to assess if there was any change in level of PA after the interventions. The REAIM framework was used as an overarching evaluation framework for Phase II. Additionally, qualitative interviews were held with stakeholders in the intervention settings to assess satisfaction levels. The results are reported in Chapter 4.

4 Results

4.1 Introduction

This chapter presents the main findings of the different parts of the study and will be divided into three sections. The first section from 4.2 to 4.7 will present the results of the Phase I of the study which looked at physical activity levels and attitudes to physical activity in older adults. Section 4.10 to 4.12 will present the results of the physical activity interventions – Phase II of the study. These results are assessed under the various elements of RE-AIM. Reach first identified the target population in each setting and the numbers that took part were expressed as a percentage of those eligible to take part. Effectiveness was measured by analysing pre and post questionnaires from participants in the interventions under the headings: physical activity measurement, knowledge of PA guidelines, self-reported health benefits and perceived barriers to PA. Adoption was measured by calculating the representativeness of organisations/settings that delivered the intervention programmes. Implementation measured (using a scale of 1 to 10) the fidelity of delivery of the programmes and the costs incurred in this delivery. Maintenance was measured by conducting qualitative interviews with stakeholders.

4.2 Phase I Results

The study used the Socio-Ecological Model as an overarching framework to guide the questionnaire. The results of Phase I questionnaire will be presented under the headings which reflect this. The Individual level of the SEM included questions on demographics such as age, gender, occupation, area of residence. Questions also addressed psychological factors (attitude to PA, intention to change, self-efficacy levels and motivation for PA). Social Environment factors such as level of social support for PA, influence of others and own activities. The Physical environment level of SEM was addressed with questions about suitability and walkability of local area for PA. Interpersonal level of SEM looked at influence of peers, club membership and the influence this has on PA levels, and, finally, gym membership and fitness instructors as facilitators for PA. Older adults were asked what programmes they would like to see implemented (policy level)

4.3 Demographics

Three hundred and forty questionnaires were distributed in March 2015. A total of 300 were returned, giving a response rate of 88.2%.

Thirty six percent of respondents were male (n=108) and 64% were female (n=192). Rural dwellers, defined as anybody living outside the built up areas of a town or village accounted for 55.7% of the sample (n=167) and town dwellers for 44.3% (n=133). The mean age of participants was 65.9 years with a standard deviation of 7.895. The mode was 70 years. The youngest individuals were 50 years (n=5) and the oldest person was 85 years.

The following table illustrates the employment status of the respondents who took part in Phase I of the study.

	Frequency	Percent (%)
Retired	174	58.0
Semi-retired	31	10.3
Caring for grandchildren	7	2.3
Volunteering	9	3.0
Employed full-time	48	16.0
Employed part-time	14	4.7
Other	17	5.7
Total	300	100.0

Table 5. *The current employment status of the participants.*

4.4 Physical Activity - RQ 1: What levels of physical activity are currently being achieved by older adults?

Under this section, the participants were firstly asked: 'According to current physical activity recommendations, what is the minimum amount of moderate to vigorous intensity physical activity that adults should perform to gain health benefits'? Of the 24 who responded in (150 minutes per week of moderate to vigorous physical activity), only 1 participant answered correctly.

The questionnaire asked respondents to 'rate your level of physical activity compared to other people the same age and gender'? The majority, (65%) rated their activity levels to be at least the same as or more than others of same age and sex. Next, when asked to rate how physically active they were in comparison with their peers, 35% rated their activity levels as less or much less than their peers (same age, same sex). The results are presented in Table 6.

Level	Number	Percent
Much less than others	45	15.0
Somewhat less than others	60	20.0
About the same	83	27.7
Somewhat more than others	83	27.7
Much more than others	29	9.7
Total	300	100.0

Table 6. *Participants' perception of how physically active they are in comparison to their peers.*

A Chi Square test was used for measures of independence. It looked for a comparison between perceived physical activity levels and gender. Results showed that while females, are more likely to rate themselves as currently more physically active than males, in this study males were more active than females. However, there was no significant difference in either case. The shortened International Physical Activity Questionnaire (IPAQ-SF) short form was used and an average of the two items (activity in the past week and activity in a typical week) produced a score of days per week that the participants accumulated at least 30 minutes of MVPA. Thus, it emerged that 30.5% (n = 93) of older adults achieved 30 minutes of physical activity on 5 days or more. This means that 69% (n=207) of the sample failed to meet the recommended guideline.

A comparison was done between males and females and physical activity in a previous week and in a typical week. In both instances males were more active, but only significantly more active in a typical week (p=0.021).

Physical Activity levels	Male	Female	p value (> .005)
Number of times active for 30 minutes or more (5 times or more)	36.6%	27.6%	p = .191
Number of days on which muscle strengthening activities were performed	35.3%	22.9%	**p = .005**

Table 7. *Shows a comparison between males and females in frequency of physical activity and also muscle strengthening activities.*

4.4.1 Muscle Strengthening Activity

The questionnaire asked people how often in the previous 7 days they had done exercises that might strengthen their muscles (push ups, sit ups, weight lifting or heavy lifting). A total of 182 respondents (60.7%) had done no muscle strengthening activities in the previous 7 days, meaning 37.3% met the guidelines of at least twice per week. The table above (Table 7) shows that males were significantly more likely to do muscle strengthening than females (p=0.005).

Purchase of home exercise equipment (such as treadmill, exercise bike, stepper, weights, bands, instructional videos) is quite low. It was found that 82.3% (n=247) had not purchased home exercise equipment in the past three months. Further analysis found that while more males (85.2%) purchased home exercise equipment compared to females (80.7%), the difference was not significant.

4.4.2 Group / club membership

Participants were asked if they were a member of any group / club / organisation such as a sports club, community group, active retirement group, workplace social group, gym, walking club) that includes physical activity (exercise or sport) as part of their activities. Of those surveyed, 56% (n=168) said they were. There was no significant difference between males (58.3%) and females (54.7%) regarding group / club membership (p=.541).

They were then asked what activity the group, of which they were a member, provided (see Diagram 5 below).

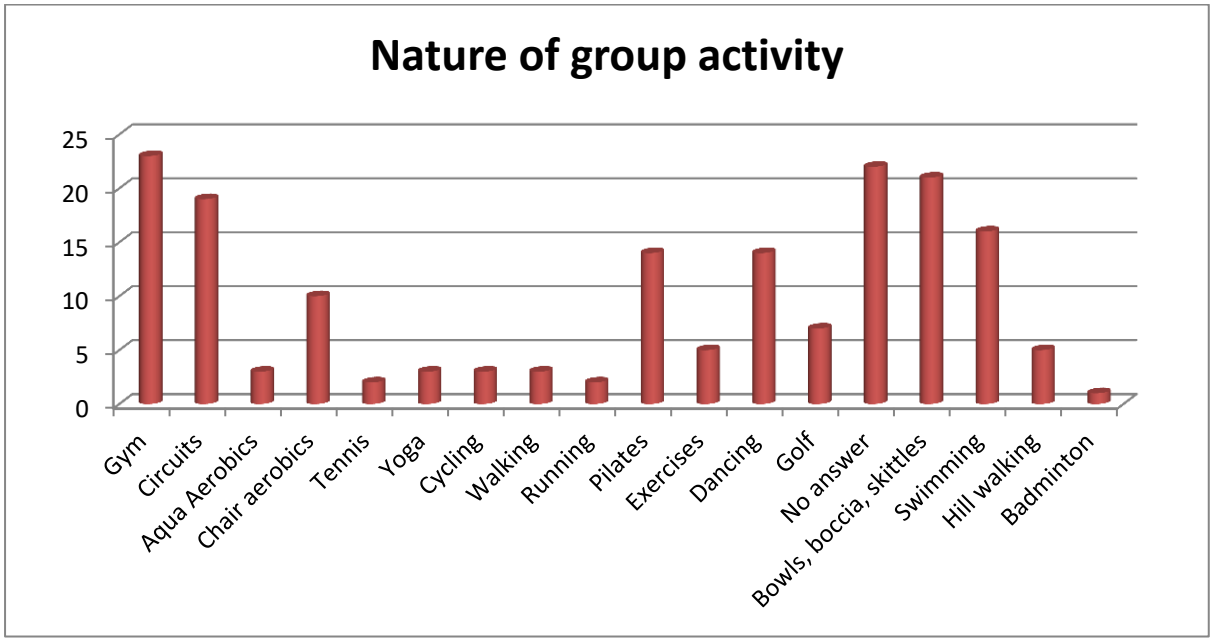

Figure 5. *Type of activity undertaken by respondents.*

Those that were members of a group that provided physical activities (56%) were then asked which activity they took part in. Using descriptive statistics (frequencies), the top five physical activities undertaken by those who are group members were: gym, (no named / specific gym activity) (23%); bowls, boccia and skittles (21%); circuits (19%); Pilates (14%) and dancing (14%). The number of participants reporting walking as an activity is very low – 3%. This could be partly explained by the fact that none of the groups surveyed provide walking as an activity.

A Chi Square test for independence was performed to see if being a member of a group influenced physical activity participation. Members of a group were significantly more likely to achieve recommended PA guidelines ($p = .001$) than those who are not group members. Although no significant difference was found, group members were marginally more likely to do muscle strengthening activities than those who were not group members.

Even though PA guidelines are being met by only 31% of the sample, 80.7% (n=242) of those surveyed, believe that they were currently sufficiently active. Similarly, 63% of those surveyed indicated that they 'have been active' for the past 6 months. This shows that people perceive themselves as being active, even though they may not be meeting the guidelines for

PA. Older adults are acutely aware of the importance of physical activity, because it was rated as either 'extremely important' (38%) or 'important' (55%) by 279 of the 297 of those surveyed. Conversely, only 3.7% rate physical activity as being 'not important at all'.

4.5 RQ 2. What are the perceived barriers and facilitators to older adult participation in physical activity?

The next set of questions sought to find out some of the barriers / facilitators to older adult participation in physical activity. Variables such as intention to change, previous physical activity levels and importance were explored here. When exploring intention to change, a total of 62.3% (n=187) indicated that they 'intend becoming more active' in the future. Without being asked to specify a reason, 24% said that in the past they 'had tried to be active but that it hadn't worked out'. Then, respondents were asked for personal reasons for not being active. Due to the small sample size, the Likert Scale was recoded and condensed down to two responses (Agree or Disagree). Recent illness, operation or medical reasons (61.1%) followed by poor health (48.9%) were the most often cited.

Reason for not being active	Agree % (n)	Disagree % (n)
Recent injury, illness, operation or medical reasons	*61% (n = 83)*	*39% (n = 53)*
Poor health	*48.9% (n = 67)*	*51.1% (n = 70)*
My friends are not active	*41% (n = 50)*	*59% (n = 72)*
Physical activity is too expensive	*38.8% (n = 50)*	*61.2% (n = 79)*
My partner / spouse is not active	*38.4% (n = 43)*	*61.6% (n = 69)*
I have a disability	*36.9% (n = 48)*	*63.1% (n = 82)*
I have no time due to work / family commitments	*24.2% (n = 30)*	*75.8% (n =94)*

Table 8. *Reasons for not being active.*

A Chi Square test for independence was performed to explore if place of residence (urban or rural) was a factor influencing physical activity levels in older adults. While there were differences, urban dwelling older adults seem to have less time for physical activity, no significant differences emerged. The same test was carried out comparing gender and urban and rural dwellers and again, differences emerged but none of them were significant.

I have no time for physical activity	Agree	Disagree
Urban	31.4%	68.6%
Rural	19.2%	80.8%

Table 9. *The differences between urban and rural dwellers perception of time available for physical activity.*

4.5.1 Environment

Physical environment factors have been shown to have an association with levels of physical activity and with choice of activity. Participants were presented with 7 statements which related to their neighbourhood and how environmental factors might affect their decisions and attitudes to physical activity. The results of these are presented below in Table 10. The questionnaire used a 5 point Likert scale, however, these were recoded to a 3 point scale – agree / strongly agree became agree and disagree / strongly disagree were recoded to disagree. Don't know remained the same.

Statement	Agree	Disagree	Don't Know
My neighbourhood has plenty of safe footpaths	49.3% n = 147	47.7% n = 142	3.0% n = 9
I do not have access to public parks for walking	38.8% n = 116	56.7% n = 169	4.4% n = 13
There is no gym or indoor fitness facility near me	36.7% n = 109	57.5% n = 171	5.7% n = 17
There is a gym or fitness facility near me but I would not join it	53.8% n = 158	36.3% n = 107	9.9% n = 29
It is not safe for pedestrians to walk on or cross the road in my area	50.5% n = 150	34.8% n = 133	4.7% n = 14
There are cycling facilities in my locality	45.8% n = 136	46.1% n = 137	8.1% n = 24
My area is not safe / too much traffic and this prevents me from being physically active	37.0% n = 110	58.6% n = 174	4.4% n = 13

Table 10. *Participants' perception of the environment for physical activity.*

The same statements were then analysed using the Chi Square test for Independence to assess differences across gender and urban / rural residency. There were differences between males and females on most statements but these were not statistically significant except that males were more aware of cycling facilities. There were significant differences between rural and urban dwellers on a number of statements. Urban dwellers had higher awareness of: safe footpaths suitable for walking on; access to public parks; access to a gym or fitness facility and also are more likely to perceive it as being safe to walk on or cross the road. These are presented in table 11.

Statement	Town	Rural	Difference	Male	Female	Difference
My neighbourhood has plenty of safe footpaths	74.4% (agree)	31.9% (agree)	Yes (p = 0.00)	55.9% (agree)	48.1% (agree)	No (p = 0.208)
I do not have access to public parks for walking	30.2% (agree)	49.1% (agree)	Yes (p = 0.001)	39.6% (agree)	41.3% (agree)	No (p = 0.78)
There is no gym or indoor fitness facility near me	26.6% (agree)	48.7% (agree)	Yes (p = 0.000)	55.9% (agree)	48.1% (agree)	No (p = 0.213)
There is a gym / indoor fitness facility near me but I would not join it.	91.7% (agree)	88.9% (agree)	No (p = 0.437)	91.4% (agree)	89.4% (agree)	No (p = 0.580)
It is not safe for pedestrians to walk on or cross the roads in my area.	28.8% (agree)	46.5% (agree)	Yes (p = 0.002)	58.2% (agree)	50.3% (agree)	No (p = 0.206)
There are cycling facilities in my locality.	66.9%% (agree)	62.9% (agree)	Yes (p = 0.00)	59.6% (agree)	44.3% (agree)	**Yes (p = 0.015)**
My area is not safe / too much traffic and this prevents me from being physically active.	*66.9%% (agree)*	*50.9% (agree)*	Yes (p = 0.002)	*38.8% (agree)*	*38.7% (agree)*	No (p = 0.979)

Table 11. *Comparison in differences in geographic location, sex and environmental barriers/facilitators for physical activity.*

To summarise the above the table, town dwellers are significantly more likely (p=.002) to perceive their neighbourhood as having safe footpaths, no sex differences were found. Rural dwellers are significantly less likely to have access to a public park for walking. No gender difference. Urban dwellers are more likely to have a gym close by. However, neither urban

nor rural dwellers are likely to want to join a gym even if it was close by and no difference in opinion across gender. Rural dwellers are significantly more likely to perceive their neighbourhood as not safe for walking. The majority agree that there are cycling facilities in their locality – the same applies across gender. The majority of older adults perceive that there is too much traffic in their area (rural and urban) and this prevents them from being physically active; no significant difference between males and females.

Further analysis of the effect of environmental factors was conducted according to whether or not participants met the recommended PA guidelines. Those who meet physical activity guidelines perceived the footpaths to be safer. Having access to a public park for walking significantly contributed to them meeting physical activity guidelines ($p = .032$). There was no difference in opinion about gym or indoor fitness facility ($p = 0.19$) or perceived safety of their local areas ($p = 0.26$). Those not meeting the PA guidelines are less likely to want to join a fitness facility even if there was one near them. On the other hand, those who were meeting PA guidelines in a typical week were more likely to be aware of cycling facilities in their locality more than those who do not meet guidelines. Finally, those who do not meet PA guidelines are significantly more likely to cite that their neighbourhood (unsafe or with too much traffic) prevents them from being physically active ($p = .000$).

4.5.2 Transport

For further exploration of barriers and facilitators, participants were asked how they usually gain access to the following activities - shopping, visiting friends, travelling to leisure activities. They were given a range of transport options which are shown across the top of the following table (walk, cycle, car, getting a lift with a friend or family member, public transport). The vast majority, 90.7% (n=272), of the respondents own or have access to a car and hence it is by far the most likely form of transport (highlighted in the following table) among older adults surveyed for transport to shopping, for visiting and for leisure. The next most popular way of getting about is by walking. The results are presented in Table 12 below.

	Walk	Cycle	Car	Lift with friend or family member	Public Transport
Shopping (Total 300)	19.7% (n=56)	1.0% (n=3)	**74.0% (n=222)**	4.0% (n=12)	1.3% (n=4)
Visiting (Total 289)	16% (n=48)	0.3% (n=1)	**74.7% (n=224)**	4.7% (n=14)	0.7% (n=2)
Leisure (Total 289)	19.7% (n=59)	2.7% (n=8)	**70.0% (n=210)**	3.3% (n=10)	0.7% (n=2)

Table 12. *How older adults access various activities.*

Having suitable facilities and having suitable activities were rated highly by both males and females. However, males and females were unsure about whether having mixed sporting activities with other ages, at an appropriate level, would help them become more physically active. Males (71.4%) and females (75.9%) were unanimous about the positive influence a park has on their activity levels. On the other hand 64.9% of those surveyed said that having an outdoor gym would not necessarily encourage them to be more physically active.

4.5.3 Social support

Using frequencies, it was determined that the most important facilitator of physical activity for females was having a friend to be active with (84.7%). This was followed by having organised walking groups (84%). Females made up 64% of the survey respondents, however, 76% of males surveyed did not rate having a friend to be active with as being important, whereas females did ($p = 0.418$). Having a friend to be active with was very important to all those surveyed, more so those that were active on 0-2 days per week (79%) and those active on 3 or more days per week (78.1%). There was no difference between the groups ($p = 0.816$). In addition to this, instructors in fun settings (80.7%) and safe walking paths (80.7%) were also rated very highly by respondents. However, males (59.3%) did not rate an instructor in a fun setting as a factor that would encourage them to be more active. In comparison, 73% of females rated this as important.

4.6 Enablers for physical activity - RQ 3: What activities / strategies would older adults like to see implemented to help them achieve optimal physical activity?

For the purposes of providing information for the design of Phase II (the interventions) of the study, participants were asked to select (from a list) which activities (if available) that they felt might encourage them to be more active. There were differences across the variable of sex in each of the strategies. Significantly, men do not want activities lead by an instructor in a fun, social setting (p = 0.025).

Suggested Strategy in order of popularity (% replies number of replies)	Males Yes	Female Yes	P value
1. Having a friend to be active with (84.7% replied, n = 254)	75.9% n = 66	80.2% n = 134	0.418
2. Organised walking group in the area for all in the community (84% replied, n = 252).	59.6% n = 53	60.1% n = 98	0.929
3. Physical activities led by an instructor in a fun, social setting (80.7% replied, n = 242.	59.3% n = 51	73.1% n = 114	**0.025**
4. Safe walking paths (80.7%, n = 242)	73% n = 65	83% n = 127	**0.065**
5. Gym membership which takes my needs and interests into consideration (234 replied, n = 78%).	50.6% n = 44	40.1% n = 59	0.120
6. An outdoor gym (77%, n = 231)	38.6% n = 34	32.9% n = 47	0.372
7. A park (76.3% replied, n = 229)	71.4% n= 60	75.9% n = 110	0.460
8. Suitable facilities near me (76% replied, n = 228)	50% n= 51	48.9% n = 106	0.307
9. Sporting activities suitable for my age (75% replied, n = 225)	61.0% n = 50	62.2% n = 89	0.851
10. Sporting activities mixed with other ages but at an appropriate level (73% n = 217).	73% n = 41	83% n = 66	0.874

Table 13. *Strategies that might help increase PA among older adults (in order of importance to older adults and across sex).*

4.7 Summary of Phase I results

The main findings from Phase I of this study were that 81% of those surveyed claim to be adequately physically active but 69% of the sample failed to meet the recommended physical activity guidelines. Furthermore, 60% do not know what the recommended guidelines are. Those who are members of a club / group are more likely to achieve the guidelines for physical activity. Older adults who knew the guidelines for physical activity were more likely to meet them. Males are more likely to be physically active, more likely to do muscle strengthening activities but less likely to purchase home exercise equipment. Older adults have high levels of access to / car ownership (90.7%) and use cars for shopping, visiting and access to leisure facilities. None of the clubs / groups surveyed offered a walking programme to members even though walking emerged as a preferred activity.

Over 50% identified barriers in their neighbourhood that prevent them from walking – half of those surveyed feel it is not safe to cross the road. When asked what activity they felt would boost their physical activity levels, the majority opted for an organised community walking group (both urban and rural and on safe walking paths). In addition to this, 62.3% indicated a willingness to change (to be more active and the vast majority (93%) rate being physically active as extremely important.

Of the activities undertaken by respondents, gym and circuit training ranked high on the list of activities. Conversely many of those surveyed said they would not like to join a gym. Physical activity is thought to be expensive by over 38% of respondents. Nonetheless, many respondents would like an instructor in a fun social setting to provide physical activity.

4.8 Development of Phase II

The *Get Active Now!* Programme was devised to address the problems identified from Phase I of the study. The table below gives a brief summary of the strategies employed in the programme. A list of strategies designed to address the barriers to PA which emerged from the results of Phase I are shown in Table 14.

Problem identified	Key Plan / Strategy to solve problem
Activity levels	
1. Low levels of physical activity in sample – guidelines not being met. Also poor knowledge of guidelines **2. Walking levels are low – walking is a good way to boost physical activity levels** **3. Low levels of muscle strengthening activities**	1. Improve knowledge of guidelines through mass media campaign and booklet production 2. Offer safe community walking programmes to urban and rural dwelling older adults 3. Introduce circuit classes to a local community group
Key barriers / facilitators	
1. Poor knowledge of guidelines **2. Older adult groups and community groups not offering basic walking programmes** **3. Perceived danger of the environment is a barrier to walking as a form of physical activity** **4. Antipathy towards gym membership. Perceived high cost of physical activity**	1. Mass media campaign and produce information booklet to distribute to older adults 2. Offer beginner walking programmes to older adult and community groups in rural and urban setting 3. Ensure walking programmes take place in safe environment to alleviate fear of danger 4. Give participants the opportunity to sample discounted gym session.

Table 14. *Strategies to be employed in Phase II to address findings from Phase I of the study.*

4.9 Mass Media Campaign

Phase I showed that knowledge of physical activity guidelines was poor. In conjunction with the *Get Active Now!* programme, a supporting information campaign was conducted through mass media. This campaign sought to increase knowledge of the need to be physically active, increase knowledge of PA guidelines and promote the programmes taking place in each setting. The researcher wrote a series of 9 articles for two local newspapers and they were published as per the agreement with the editors. The newspaper articles which were published

weekly commenced a week prior to the start of the programme and finished a week after the last session. They are contained in *Appendix G.* The last ABC certified circulation figure for the *Kilkenny People* is 10,591 (December, 2012). The *Kilkenny Reporter* distributes 20,000 free copies per week. Readership is usually calculated by multiplying these figures by 3.5. The researcher also published an information booklet which was distributed through pharmacies, to General Practitioners, active retirement groups, settings taking part in the programme and community groups. The booklet is contained in Appendix G.

4.10 Phase II Results

This section presents the results from Phase II of the study – the Get Active Now! Programme. The aim of Phase II of the study was to enable community based PA for older people in Kilkenny, using evidence based planning and information gathered from the review of literature and Phase I data. It is important to note that the job of the researcher was to enable and facilitate partner organisations and facilities to promote PA offerings, not to become a key deliverer of interventions. This is in keeping with good health promotion practice and is most likely to bring about sustainable PA change.

Evaluation of the Get Active NOW! Programme was guided by the RE-AIM framework. The Re-AIM framework was chosen because it balances individual and organisational influences for programme evaluation. The RE-AIM framework helped measure and understand the individual and organisational factors affecting the *Get Active NOW!* interventions which took place across 5 settings. The five elements will be discussed in the following order: Reach, Adoption, Implementation, Maintenance and finally, Effectiveness.

4.10.1 Reach

Reach refers to identifying the intended target population and takes into account the criteria for including or excluding people. In this study it was older adults, both males and females over 50 years. Reach is then calculated by dividing the number of people who take part by the total eligible population. Only participants in the immediate vicinity of the settings were exposed to recruitment. Many of those exposed to recruitment did not participate. This figure determines how much impact the study has. Low participation numbers might mean that results cannot be generalised to real world settings.

Table 14 below shows the total eligible population by gender for the 5 settings in the Get Active NOW! Programme. Three of the settings (Community Centre1, Community Centre 2

and Fitness facility) were in the larger Kilkenny City area which is a combination of Kilkenny Rural, Kilkenny Urban I and Kilkenny Urban II electoral areas. This combined area has an older adult population of 7,054 people. The other settings (Rural Setting 1 and Rural Setting 2) are in areas within 10km of Kilkenny city and have older adult populations (>50 years) of 203 and 150 persons respectively.

Electoral Area	Total Population	Population >50 years	Eligible Males >50	Eligible Females >50
Kilkenny Rural (suburbs of urban area)	16,833	4,150	1,901	2,249
Kilkenny Urban I	5,211	1,538	674	864
Kilkenny Urban II	3,500	1,376	624	752
TOTAL KILKENNY CITY	25,544	7,054	3,199	3,865
Rural Setting I	624	203	95	108
Rural Setting II	468	150	74	76

Table 15. *Shows a population overview by area and eligibility to participate in the study.*

Demographic information about the settings used in the programme was accessed using the Pobal HP Deprivation Indices (Hasse and Pratschke, 2012). This Index is a method of measuring the level of disadvantage or relative affluence of an area from data in Census 2011 (Central Statistics Office, 2011). The two areas in which the Community Centres are located are termed 'very disadvantaged' with higher levels of deprivation and lower levels of educational attainment. Using the same criteria, the two rural settings were classed as marginally above average and had higher levels of educational attainment. The Fitness Facility in the study has a large catchment area and this area is generally classified as marginally above average on the Pobal HP Deprivation scale.

As per Phase I of the study, those under 50 years were excluded from Phase II of the study. This gave a total number of the population in each setting area that was eligible to take part in

the study. The following table shows Reach according to setting, eligibility to take part, the type of activity undertaken in each setting and by number and percentage of eligible population.

Setting	Eligible population >50 years (n) (% of population)	Type of Activity undertaken in the setting	Reach (number of those eligible that participated)	Reach (% of those eligible that participated
Community Centre 1	7,054 (28%)	Walking programme	6	0.085%
Community Centre 2	7,054 (28%)	Walking programme	12	0.17%
Community Centre 2	7,054 (28%)	Chair based activities	14	0.19%
Rural Setting 1	203 (32%)	Walk	10	4.9%
Rural Setting 1	203 (32%)	Chair based activities	8	3.9%
Rural Setting 2	150 (32%)	Hall based aerobic and muscle strengthening activities	12	8%
Fitness facility	7,054 (28%)	Gym (resistance training), walking, indoor cycling	15	0.2%

Table 16. *Summarises Reach.*

Overall, the response to the programmes was low. In total, 65 participants took part in the programmes across 5 selected settings. See *Appendix E* for details of the interventions and the

settings. Reach was higher in rural settings. One of the settings requested the intervention and the other had had a previously existing programme which had been abandoned. The rural settings also had smaller populations than the urban centre. Furthermore, both had community leaders who were very supportive of the programmes. Having an instructor in a fun setting was cited by 81% of respondents in Phase I as important although males were less inclined (60%) to want this. The low numbers are explained in the Adoption section.

4.10.2 Adoption

In the RE-AIM framework, Adoption is calculated as the absolute proportion and representativeness of organisations / settings that deliver a programme including staff (Van Acker, 2011). Settings (communities, public facilities, schools and agents (staff, teachers, physicians) vary in their size, level of staff expertise, knowledge and level of commitment. Variances between settings and agents in protocols and procedures can be the cause of differential adoption. Planning of physical activity programmes needs careful attention and evaluation needs to be considered at the planning stage. Successful programmes are those that will be adopted, create sustainable change and be implemented in a variety of settings over time (Glasgow, 2007). The following section details the amount of planning that went into each setting. Details are given under three headings: Rationale for Selection; Agreed Duties; and Recruitment Methods.

***Community Centre** 1*

Rationale for Selection: An older adult men's group took part in Phase I of this study. Prior to the intervention, the group indicated a willingness to be part of the intervention study. Their group are very low active (boccia, bowls games once weekly). The setting, located in the city centre, was chosen because there is an underused walking track and outdoor gym nearby. The centre is also the focal point of the community and research shows that the community is an excellent place to base interventions for behaviour change (Sallis, 2006). Phase I results showed that 62.3% of those surveyed intended to become more active. Furthermore, none of the groups that participants were members of provided walking as a source of PA. However, a walking group was cited by 84% of respondents as a potential facilitator to PA and also, 81% of respondents said safe walking paths would encourage them to be more active which made this location suitable.

Agreed Duties: Management at the setting outlined the level of support that they could give to the project (promote to service users, recruit participants to the programme, advertise in neighbourhood and leaflet drop to houses in the area).

Recruitment Methods: The researcher erected posters in local shops (4), two community centres (4), two pharmacies (2) and a Primary Care centre (2). Additionally, 120 leaflets were delivered by the researcher to an adjacent housing estate. Notices were placed in the Parish Newsletter in the two weeks before the programme commenced. The programme was promoted in the weekly newspaper articles written by the researcher and also in the *Get Active Now!* booklet produced by the researcher.

Community Centre 2

Rationale for Selection: Participation and empowerment are among the principles and practice which under-pin the work of this Centre and this made it an appropriate setting for a project which aimed to increase walking levels. The setting was chosen partly because the researcher has had contact with the centre on previous projects and also, there is a park with walking track adjacent to the centre. Phase I results indicated that having safe footpaths in the area was a key environmental factor in promoting physical activity. However, older adults surveyed were divided in their opinion as to whether their neighbourhood has adequate safe footpaths while almost 39% stated that they did not have access to public parks for walking. Poor perception of the environment is a barrier to PA (Sallis, 2006). In addition to this, there is an established older adult ladies group in the centre but their activity levels are very low. They indicated a willingness to take part in a chair based exercise programme.

Agreed Duties: The community centre agreed to promote the programme locally. A Health Promotion student delivered the chair based exercise programme. The researcher delivered the walking programme.

Recruitment Method: The activities were advertised in the centre by poster and word of mouth by the outreach workers. One hundred and twenty leaflets were delivered to an adjacent housing estate. The walking programme and chair based activities were also advertised in the Parish Newsletter. The programme was promoted in the weekly newspaper articles written by the researcher and also in the *Get Active Now!* booklet produced by the researcher.

Rural Setting 1

Rationale for Selection: Previously there had been a walking group in the area but had disbanded in the previous summer. From Phase I results it was found that rural dwellers are more likely (than city dwellers) to think their neighbourhood is not a safe place to walk. Furthermore, 60% of those surveyed rated having an organised walking group as something that might encourage them to be more physically active. In this rural setting, there is a walking track in the local GAA club. Almost half of older adults surveyed said they would not join a gym (47.9%). People living in rural locations are less likely to have a gym close by, therefore, group fitness class in the local community hall and a walking programme were provided. When planning an intervention for PA it is important not just to target individuals but to target the physical and social environments too.

Agreed Duties: The local Parish Committee gave permission to use the local community hall (for the chair based activities). The local GAA club gave permission to use the walking track attached to the club for the walking programme. In both instances insurance was provided by the Parish Committee and the GAA club respectively. Permission was given to the researcher to erect posters in the local church and to distribute flyers after Mass on the Sunday prior to the programme commencing. A Health Promotion student on work placement from Waterford Institute of Technology delivered both programmes.

Recruitment Method: Posters were erected in the Church and community centre and 80 leaflets distributed after Sunday Mass. A notice was placed in the Parish Newsletter promoting the programme. The programme was promoted in the weekly newspaper articles written by the researcher and also in the *Get Active Now!* booklet produced by the researcher.

Rural Setting 2

Rationale for Selection: The setting has a new community centre suitable for PA programmes. From Phase I, 75.9% of respondents rated 'having a friend to be active with' as the most important thing that might help increase their PA levels. Also, having PA led by an instructor in a fun, social setting also ranked high on the list of strategies to increase PA (59%).

Agreed Duties: In this setting, the Community leader agreed to promote the classes and the researcher agreed to deliver the classes. The community leader was responsible for sending text messages to each participant before the classes.

Recruitment Method: The classes were advertised in the local parish newsletter and also on posters in the Community centre and the church. The programme was promoted in the weekly newspaper articles written by the researcher and also in the *Get Active Now!* booklet produced by the researcher.

Fitness facility

Rationale for Selection: The Fitness Facility was chosen because it is a public facility with 'pay as you play' options and is conveniently located in an area of high population density. Private (mostly hotel based) facilities do not offer this option to customers in the area. From Phase I it was found that over 53% of those surveyed would not join a gym / fitness facility. Also numbers of older adults engaging in muscle strengthening activities were low. The facility wanted to increase usage by older adults and to create awareness among older adults that the facility is an inclusive one.

Agreed Duties: The fitness facility agreed to meet with the researcher to discuss the planning of the programme. They agreed to promote it to local active retirement groups, Parish groups and bridge clubs. They also agreed to send text messages to lapsed and former older adult members. Furthermore, they agreed to promote the programme internally with posters in the lobby and public areas. They also provided information on the programme to staff on reception and fitness instructors, about their role in the programme.

Recruitment Method: Internal posters were erected by duty manager in the lobby and swimming pool viewing areas, text messages were sent to customers, an advertisement was placed in a local newspaper. The programme was promoted in the weekly newspaper articles written by the researcher and also in the *Get Active Now!* booklet produced by the researcher.

Adoption - Summary

The following table shows Adoption levels for the programme (number of eligible settings as described above). Settings were chosen for both variety and the extent to which they could fit in with results from Phase I. All of those that were contacted took part in the programme. The following table also shows the number of staff who took part in each setting. Taking part means both supporting the programme in an official capacity as part of their work and also taking part in the PA intervention (i.e. community leaders were considered staff because they organised the programmes but they also were participants in the programme). The final column shows those that facilitated delivery of the PA programme in each setting.

Setting (Total Eligible Settings)	Contacted (%)	Agreed to take part (%)	Staff taking part	Facilitators
Community Centres (5)	2 (40%)	2 (100%)	Community Centre 1 (0) Community Centre 2 (2)	*Centre 1.* The Researcher and Health Promotion graduate (2) *Centre 2.* Two members of Staff, Health Promotion student on Work Placement and the researcher (4)
Rural Setting (7)	2 (28.5%)	2 (100%)	Yes in both communities (2)	Setting 1. Exercise & Health Studies student on Work Placement from college (1) Setting 2. The Researcher (1)
Fitness facility / gym (6)	1 (16.6%)	1 (100%)	0	Trained gym staff facilitated all sessions (3)
TOTAL (18)	5	5	5	11

Table 17. *Provides information on programme adoption.*

Adoption is assessed according to and within the setting in which the programme is delivered. Factors measured are organisational capacity (resources and funding), participation rate among potential settings and the degree to which these settings are representative of the target population. All of the settings that were contacted took part in the programme. Forty percent of Community Centres adopted the programme. In Community Centre I, the adoptive process was not met – the centre did not meet their commitments to the programme. A shortage of staff (organisational capacity) was cited as the reason for their non-involvement. They had no involvement in the programme except to allow advertising posters to be erected

in the community centres. The programme was delivered by a Health Promotion student and the researcher who did all the promotion and recruitment work. Conversely, the two outreach workers in Community Centre 2 took part in sessions as well as doing the advertising and recruitment for the programme (posters, leaflet drop to houses and encouraging people to take part by word of mouth). Hence there was good support for the programme.

Two out of the seven rural communities in the area adopted the programme. In Rural Setting 1 the researcher received good support (permissions for facility use, insurance, advertising and introductions to key personnel). There was similar support in Rural Setting 2 including a local community leader doing all the advertising and promotion for the programme. The fitness facility had three different staff working on the programme depending on shift patterns and availability (holidays). No staff took part in the sessions and primary concern was with numbers taking part and revenue on the discounted classes. The fitness facility failed to honour their commitment to advertising and recruitment. They too cited staff shortages and time pressures as the reasons for not promoting the programme as planned and this was the main reason for the small uptake in this setting.

4.10.3 Implementation

Assessing Implementation of a programme entails examining how fidelity was maintained by the agents and staff in their delivery of the original intervention plan. This fidelity is assessed by measuring how many of the process objectives were achieved and what were the costs of meeting these objectives in relation to time and Communities *(see Logic Model, Appendix F)*.

Those that delivered the programme have qualifications from the Health and Leisure industry. Prior to programme start, a meeting was held with all facilitators for the purposes of consistent delivery across the programmes, to address any health and safety concerns and to establish a proper code of conduct/behaviour in the settings.

Table 16 (below) shows the extent of implementation across the 5 settings. In the first row, it shows the number of components delivered in each setting and also the core programme content and duration of each piece. The next row shows the number of PA sessions that took place during the programme. Row 3 shows whether staff contributed towards programme delivery. Row 4 shows if implementation was taking place as per the agreed protocol; the researcher monitored sessions in all of the settings except the fitness facility. Monitoring in this instance is defined as checking that each element of the programme was being delivered

as agreed between the facilitators, management and staff in each of the settings. Items monitored were advertising, duty of care to participants, PA screening, attendance sheets, and completion of pre and post study questionnaires. Row 5 shows who did the advertising and recruitment in each setting. Finally, implementation fidelity scores were awarded. A score of 1 indicates little or no fidelity to the programme and a score of 10 (maximum) would indicate total fidelity to the programme.

	Community Centre 1	Community Centre 2	Rural Setting 1	Rural Setting 2	Fitness Facility
a) number of intervention pieces delivered and b) time per piece	1 (1 hour walking programme)	2 (1 hour each – walking programme and chair based exercises)	2 (1 hour each – walking programme and chair based exercises)	1 (1 hour aerobics and circuit training)	3 (Facility available 2 hours each morning 11-1 with gym programme, indoor cycling and walking)
Number of sessions delivered per setting	5/6 100%	10/12	13	8	18
Delivered by setting staff	No	No	No	No	Yes
Monitoring included	Yes	Yes	Yes	Yes	No
Promotion and recruitment	No	Yes	No	Yes	Yes
Overall Score	2/10	7/10	6/10	10/10	8/10

Table 18. *Implementation fidelity and how each of the 5 settings scored overall.*

4.10.3.1 Implementation scores

The following section gives an explanation of how the scores for each setting were calculated:

Community Centre 1 scored poorly. (Score: 2/10). Management there did not advertise the programme and they did not take part in any implementation. They helped with advertising, but no participants were recruited from here. Furthermore, staff that work in the centre were not aware of the programme or its location and this resulted in low participation. There were issues too with programme facilitator when the original person became unavailable to help with the programme. An alternative facilitator had to be found which meant that the researcher had to facilitate the group on one occasion.

Community Centre 2 scored well (Score: 7/10). The staff advertised the programmes (posters and newsletter notices), distributed leaflets, and encouraged members to take part. They also participated in some of the sessions. One of the walking sessions did not go ahead because of a funeral in the area which most of the participants were attending. One session did not go ahead because of bad weather and an alternative venue was not available. Also, one staff member agreed to facilitate the walks and this did not happen. The researcher facilitated the walking group. – 7/10

Rural Setting 1 (6/10) did not advertise the programme (researcher promoted the programme). A committee member from the setting did take part in the chair based exercises and gave feedback on behalf of the setting. There was a problem with access to the walking track (the GAA club wanted to charge a fee of €25 per participant for use of the track during the programme) and this was not resolved by the committee. The researcher intervened through contact with the owners of the walking track.

Rural Setting 2 received maximum score (Score: 10/10). The setting advertised and recruited the required number of participants; helped with screening and distribution and collection of pre and post questionnaires; and were also proactive in ensuring maintenance of the programme. The researcher delivered the programme as there were no suitably qualified instructors available in the area willing to undertake the delivery.

The Fitness Facility scored very highly (Score: 8/10). The programme ran smoothly despite initial difficulties with advertising which included posters being removed and/relocated elsewhere within the building. Staff did not have time to visit active retirement groups for

recruitment to the programme as had been agreed at a programme planning meeting. Some changeovers in gym staff occurred due to holidays, illness and rostering which resulted in a lack of consistency of programme delivery. These staffing issues also contributed to the low numbers of older adults completing pre and post questionnaires which impacted on the programme evaluation in this setting.

4.10.3.2 Cost of the interventions

While many evaluations acknowledge the impact that lack of consistency / fidelity can have on an intervention, very few report comprehensive costings with regard to Communities, expenses, staff time, and programme delivery. The table below gives a conservative account of hours spent by the researcher on key elements of programme planning and implementation. From this, a conservative cost of the programme was calculated by multiplying hours by the minimum wage (€9.15). It was estimated that 357 hours were spent on planning and delivery of the programme at a cost of €3,266.55. Full outlines of these are given in *Appendix H.*

The following table shows the amount of facilitator time on each of the programmes at each setting. When costed at minimum wage rate (€9.15 at the time of the study) the estimate for facilitators for the programme across all settings is €787.

Setting	Activity 1	Activity 2
Community Centre 1	Walking programme 6 weeks x 1 hour weekly = 6 hours	Chair based activities (6 weeks) x 1 hour = 6 hours
Community Centre 2	Walking programme 6 weeks x 1 hour weekly = 6 hours	-
Fitness Facility	Monday, Wednesday, Friday 11am to 1pm x 8 weeks = 48 hours	
Rural Community 1	Walking programme 7 weeks x 1 hour = 7 hours	Chair based activities 7 weeks x 1 hour = 7 hours
Rural Community 2	6 weeks of hall based physical activity = 6 hours	-
Sub Total	73 HOURS	13 HOURS
TOTAL = 86 HOURS	€786.90	

Table 22. *Facilitator time in each setting and overall cost.*

Table 19 (next) gives an overview of objectives and agreed responsibilities for delivery of core content of programme

Table 19. *An overview of the intervention carried out in each setting including aim(s), objective, rationale, action (setting & researcher).*

Setting	Aim	Objective	Rationale	Action (setting)	Action (researcher)
Community Centre 1	Increase PA levels of older adults in the area	Increase walking levels. Increase use of outdoor gym equipment.	Low usage of facilities in setting prior to intervention Low level of walking. Large older adult population close by.	Agreed to support intervention with internal advertising Researcher provided facilitator	Researcher designed and erected posters. Also, designed and distributed leaflets and wrote press release for parish newsletter. Facilitated 1 session and provided facilitator.
Community Centre 2	Increase PA levels of older adults in the area	Six week, walking programme (Tuesdays). Chair based activities on Wednesdays	Low active older adult population locally	Setting staff designed, distributed and erected posters and leaflets Setting wrote press release for parish newsletter.	Facilitated all walking sessions. Provided facilitator for chair based exercises Pre-post questionnaires (distribution / collection)
Rural Setting 1	Increase PA levels of older adults in the setting	Reintroduce walking group for older adults on Tuesday mornings at 11am. Set up chair based exercises in community hall on Thursday nights (one hour).	Walking track in the area. Low numbers of adults in rural locations walk for PA. No muscle strengthening or chair based activities take place here for older adults	Provided hall and access to walking track	Researcher erected posters (community hall and church) and distributed 80 leaflets after Sunday Mass. Researcher arranged facilitator for sessions.

Setting	Aim	Objective	Rationale	Action (setting)	Action (researcher)
Rural **Setting 2**	Make PA for older adults available in local community	Deliver PA to group in local community hall.	Participants aware of Phase I of research. Group eager for PA in their own area.	Community leader advertised classes, recruited group and ensured maintenance.	The researcher facilitated 8 group exercise sessions
Fitness Facility	Increase the number of older adults using the setting for PA	Make new ancillary gym available three times weekly at a reduced rate to older adults and include complimentary cup of tea/coffee afterwards	From Phase I of research, gym usage and willingness to join gym is very low among older adults. Numbers of OA's using facility is low	Management promised to advertise and promote new programmes for older adults.	Negotiated with management regarding programme and special rate for programme.

4.10.4 Maintenance

Maintenance (at setting level) is the degree to which a programme (or policy) becomes part of that settings routine organisational practice. At individual level, maintenance reflects the long term outcomes of a programme for an individual usually after 6 months or more (Glasgow, 1999). Criteria for ensuring maintenance are: clarity regarding the programme from the outset; specifically addressing the needs of the participants; regular communication between facilitators and staff with participants (especially those who have lapsed) and follow up assessments of the programme (Belza, 2007).

For this study maintenance at setting level was done by using interviews (with questionnaire guide) to conduct interviews with key stakeholders in each setting face to face. The interviews were conducted 2 months after Phase II was completed to appraise levels of satisfaction with the stakeholders and ascertain if the programmes would continue. The key stakeholders in each setting were asked about which elements of the programme they felt worked best about the programme and also what they might change. They were also asked about their intention to continue the programme. At individual level, participants were asked in the post questionnaire which classes they might attend in the future.

Community Setting 1: The programme has not been continued even though the females who participated wanted it to be continued. None of the employees of the centre have time to dedicate to organising and leading the walk. The females who did take part inquired if the programme might recommence in the future. They were told by the centre that it would not because of shortage of staff time (other projects) and funding (to pay an external facilitator). However, they were given advice about other walking programmes in the area that had commenced they joined those.

Community Setting 2: Neither the walking programme nor the chair based activities have continued. The reason they have not continued is that outreach workers at the setting stated that they do not have the time to organise and lead the activities. They would support the activities if an external agency (LSP, Transition Year students, community walk leader) was able to facilitate the group. However, two months after the programme finished, the setting staff announced their intention to start a daily walk so that all older adults will have the opportunity to go on a guided walk on a day that suits them. They were offered 5 free places on a Community Walk Leader training course (Irish Heart Foundation). These places became available due to spare capacity on another training programme. However, despite signing up

and reserving these spaces, none of the staff attended the training course. Neither programme was being delivered six months after the intervention study ended.

Rural Setting 1: The group enjoyed the hall based activities and were very keen to have them continued after the break for Christmas and New Year. The facilitator expressed an interest in keeping the group going and, an agreement was reached with the group to change the day and time to Fridays at 7pm. However, since she has returned to college, the facilitator indicated that she was no longer available. The researcher committed to contacting the group members to try to recommence the chair based activities. However, the group activities have not recommenced because there is no facilitator available.

Rural Setting 2: The programme was still active and the same number of ladies continues to attend each week (10). The group completed 4 blocks of 6 weeks. Intensity and time of sessions increased, showing progression in physical activity levels. The session plan was altered each week. The reason for it being sustained was that the community has a leader who is willing to organise the sessions. The group undertook cycling training for late Spring when the weather improves and the evenings are brighter.

Fitness Facility: Even though the numbers taking part in the programme and numbers completing pre and post questionnaires was small, feedback about the programme and the setting was very positive. Three of the five recruited in the setting have since taken up full membership of the facility. Additionally, the researcher received 4 telephone calls and the same number of verbal requests about the possibility of the programme recommencing following the original 8 week programme. As a result the programme has been retained by management at the original price (€3 per session to include tea or coffee). After a year, the programmes continue to run with a slight increase on numbers.

4.10.5 Effectiveness

The effectiveness domain of the RE-AIM framework measures the impact an intervention may have on behaviour. This impact is usually reported as positive. However, negative or unintended consequences of an intervention are seldom evaluated (Virgina Tech College of Agriculture and Life Sciences, 2015). Effectiveness of studies can be assessed by using prospective studies with comparison groups or by using pre/post testing.

For the *Get Active Now!* Programme, effectiveness was assessed in several ways. Firstly, questionnaires focussed on information recall, knowledge of physical activity guidelines and

changes/maintenance of physical activity levels. Secondly, qualitative interviews were held with the key programme agent in each setting to assess how effective they deemed the programme to be.

4.10.5.1 Physical activity measurement

Analysis of 45 completed questionnaires showed that participants accumulated 30 minutes or more of physical activity on 3.09 days (SD 1.72) pre intervention and this increased significantly (p=.008) to 3.36 days (SD 1.5) post intervention. The PACE + measure reported an ICC of 0.85 (95% CI 0.72 – 0.91) for the pre intervention measures and an ICC of 0.85 (95% CI 0.73 – 0.92) for post intervention measures.

Pre intervention, participants undertook muscle strengthening activities on 1.33 days per week (SD 1.50). There was a significant change post intervention as the number of days the participants engaged in muscle strengthening activities improved to 1.88 days per week (SD 1.46). This indicates a significant difference (p = .001).

Using descriptive statistics to analyse knowledge of PA guidelines, 76.5% answered 30 minutes or more per day but post intervention, this increased to 86.7%.

Participants were asked to self-rate their physical activity levels in both the pre and post questionnaires. The results show a decrease in numbers reporting themselves as being less physically active than others. Moreover, there was a significant increase in those who self-reported as being more active than others of the same age and gender as themselves (p = 0.008).

Response (n = 43)	Number Pre	Percentage Pre	Number Post	Percentage Post
Less than others	14	31.2%	12	26.6%
About the same	17	37.8%	16	35.6%
More than others	12	26.6%	15	33.4%
Missing	2	4.4%	2	4.4%

Table 20. *The differences in how participants rate their physical activity levels pre and post intervention.*

4.10.5.2 Knowledge of PA guidelines

In conjunction with the PA interventions across the five settings, a series of 8 weekly newspaper articles were written and published in local newspapers. Additionally an 8 page booklet covering topics such as: reasons for being active; how to commence a PA programme and where to get help; was published and distributed widely to older adults throughout the intervention area. Copies were made available to participants through the participating settings and through General Practitioners, pharmacies, active retirement groups in the region.

Participants were asked if they had recently read or heard information about the nationally recommended physical activity guidelines. Before the interventions commenced 63% (n = 28) replied that they had (yes). There was a significant change after the interventions were complete, 78% (n = 35) replied that they had heard some information (p = .018). Following on from this, the next question asked those that responded 'yes' to recall the key content from the booklet or newspaper articles. The most common message recalled was about the need to be more active or to increase activity (n = 15); Messages about the benefits of walking were next (n = 6); another theme recalled was about positive living (diet, exercise, social engagement and sleep habits) (n = 2).

Participants were asked, in pre and post questionnaires, to choose between two statements regarding their PA levels. While there were changes (see table below), the changes were not significant (p = .486).

Statement	Pre (43 replies)	Post (45 replies)
I take enough physical activity to keep healthy	40% (n = 18)	49% (n = 22)
I don't take enough physical activity to keep healthy	55.6% (n = 25)	51% (n = 23)

Table 21. *Participant self-assessment of physical activity levels for health benefits pre and post intervention.*

4.10.5.3 Self-reported health benefits

At the start of Phase II, participants were asked what they hoped to gain from the intervention programme in their chosen setting. Health benefits (78%) and an increase in motivation to be physically active (71%) were the two that received the most nominations. When analysing post intervention questionnaire it emerged that 78% (n = 35) felt that they had received health benefits and the same number had become motivated to be more physically active.

4.11 Barriers

Pre intervention, the most common reported barriers to physical activity were: lack of confidence (15%); having friends, spouse / partner who were not active (15%); and, not having time due to work/family or lack of interest (13%). Post intervention, the same barriers emerged but with less responses. Lack of confidence (8%); having friends, spouse / partner who were not active (11%); and no time due to work/family or lack of interest (9%) were the most common.

4.12 Exit Interviews

At the end of the *Get Active Now!* Programme, four out of the five settings agreed to do the face to face exit interviews with the researcher (the setting that did not take part was Community Centre 1 which cited lack of resources for not assisting with the programme). The aim of this qualitative aspect of the study was to gain insight into the success, effectiveness and satisfaction with the programme from the stakeholder's point of view. The questions were mapped to the Logic Model and tracked inputs and short term outcomes, as suggested by Levin in the Physical Activity Evaluation Handbook (Levin, 2002).

All of the stakeholders, who were duty managers, outreach workers, community organisers/volunteers, cited the promotion of physical activity for older adults as their main reason for getting involved in the interventions.

'To promote social inclusion and to make the older adults who use the centre aware of their fitness levels'. (Subject A)

'To let them (the older adults) know that we are here and that we provide activities for older adults. To let them know that we do provide for all sections of the community'. (Subject B).

The researcher promoted one of the programmes and the other programmes were promoted by the setting (staff or volunteers) through newspapers, posters and text messages. The four

settings expressed satisfaction at how the programmes ran. The stakeholders said that having suitable staff / facilitator and suitable venues (premises and walking tracks), contributed to the success of the programmes. This was especially true if the older adults were familiar with the venue. Community Centre 2 said that it might be better to organise a walking programme in spring / summer because bad weather was a deterrent to participation. The fitness facility discovered that many older adults were not aware that the facility catered for older adults as well as younger people.

All settings believed that the target audience was reached and felt that older adults benefitted from the programmes even though none of them did any evaluation. They all wished to either continue or expand the programmes.

Subject A*: Ah it did - without a doubt. We have had people coming into the centre in the last week or two enquiring about it still. Some of them are wondering if we are getting back to it.*

The fitness facility would like more resources (staff time) to promote the programmes adequately to older adult groups (active retirement, parish groups and clubs).

Three of the settings reported positive change in attitude towards physical activity and the fitness facility reported that some older adults had taken out membership as a result of the programme. All settings were happy that resources invested represented good value for money.

Subject D: *Well it took them a few weeks to get used to the exercise but once they started going they allot into the routine (of attending).*

The fitness facility intended to keep delivering the programme and charge the same discounted fee and possibly introduce new classes for older adults. Staff at one of the community settings would like to do a walk leader programme to enable them to plan their own walking programmes. For those that use their centre, they believe that walking is the best form of exercise. Other settings would like to see more programmes like those promoted in the intervention. The fitness facility would like to see older adult cycling promoted. Table 23 below gives a brief summary of the interviews.

Table 23. *Gives a brief synopsis of the qualitative interviews held with the stakeholders post intervention.*

Guiding Question	Community Centre 2	Rural Setting 1	Rural Setting 2	Fitness Facility
1. Why did you get involved in this initiative?	Social inclusion for older adults	To provide activity for older adults in the Parish	To promote physical activity for older adults	To promote our Older Adult programme and let people know we cater for all ages
2. What were your expectations of the initiative?	Sceptical after discontinuation of a previous programme offered to us	No expectations. A walking group disbanded last summer	None	It would help us become more inclusive
3. What action did you do to promote the programme?	Leaflet drops. Promoted the programmes in the centre	Nothing – researcher did all the promotion	Advertised in the newspaper and posters in the centre	Newspaper advert and sent text messages to members
4. Do you think the programme delivered as planned?	Yes – everything went as planned	Yes	Yes 100%	Yes 100%
5. What internal influences might have affected the programme?	Older adults are comfortable in the centre	The facilitator was excellent	The venue was perfect. All participants are familiar with it.	Staff (gym and reception) worked well together

Guiding Question	Community Centre 2	Rural Setting 1	Rural Setting 2	Fitness Facility
6. What worked / or didn't work in the programme?	Weather was sometimes bad for walking. The instructor was excellent	Both hall and walking track are excellent facilities. No matter how you plan activities, not every night suits everybody for meeting.	Started off well and got better as weeks went by	People did not know we catered for older adults. We need to do more advertising
7. Do you think the programme reached the target audience? Why?	Without a doubt	Yes	Yes – but we would like more men to attend the activities	Yes and we want to expand on this now
8. What could be done differently to make the programme more effective?	Start again – many are anxious to continue walking	Start the programme again as soon as possible	No answer	We need more time to visit groups to promote our programmes and we do not have that time
9. Did those who participated become more active as a result of the project?	They are still talking about the programme even if they are not doing anything	Yes	Too soon to tell	Yes

Guiding Question	Community Centre 2	Rural Setting 1	Rural Setting 2	Fitness Facility
10. Do you believe that there was a behaviour change or change in attitude towards physical activity?	Yes – positively towards being active	Yes	Positive change	Yes, some older adults from the programme have taken out memberships
11 What were the reactions or comments of those who participated to the project?	They want a permanent walking programme in the area	The group have 'never done exercise like that before'.	Enjoyed the programme and 'noticed the benefits'	New relationships between clients. They have made new older adult friends. New relationships between staff and clients too
12. Do you feel the amount of time/resources invested by you in the programme was worthwhile?	Yes – and we intend to continue	Yes. We would be willing to pay for this in future	Yes	Yes. We are continuing the programme at the same price and with the same benefits

Guiding Question	Community Centre 2	Rural Setting 1	Rural Setting 2	Fitness Facility
13. Based on this research initiative, do you plan on continuing or further developing/improving the programme for the immediate future?	We would like to do a walk leader training programme	Yes	Yes we are continuing the programme for the Spring / early Summer	Yes and we intend to introduce some new classes. Some older adults have attended other classes on our programme
14. Do you have any other ideas about how to increase physical activity amongst older adults in Kilkenny?	Hopefully our new walking programme will help promote walking (the best exercise) in Kilkenny	We would like to see more programmes like this for older adults	Introduce a 5km / 10 programme for over 50's	Promote cycling facilities that are older adult friendly

4.13 Chapter Conclusion

This chapter presented the findingsof the study from Phase I (questionnaire) and Phase II interventions. Phase I found that older adults surveyed were neither adequately aware of the PA guidelines and were not achieving PA as per the recommended guidelines. Those that were members of a group (56%) were more likely to achieve PA guidelines. Other personal barriers to PA were illness and poor health, the cost of PA and having inactive friends. Perceived lack of safe place to walk and an apathy towards gym/fitness centre membership were found to be the main environmental barriers. Social support, such as having a friend to be active with and having organised walking groups in the community were identified as being facilitators to PA. Older adults indicated a willingness to change - to become more physically active. Using this information a series of interventions were designed in both rural, urban and fitness facility settings.

Phase II (*Get Active NOW!)* was developed in consultation with stakeholders (key people) in 2 urban, 2 rural communities and a fitness facility. The RE-AIM framework guided the evaluation as it balances individual and organisational influences. Reach was quite low (0.085% to 2%). The interventions were effective in raising PA levels (increased PA, improved health benefits and less barriers to PA) and increasing knowledge of PA guidelines in those that participated. All settings that were contacted adopted the programme which meant 40% of community centres; 28.5% of rural community settings and 16.6% of fitness facilities in the study area. Exit inteviews were conducted with key stakeholders in each setting to gauge implementation. Implementation was also measured using a scale of 1 (little or no implementation) to 10 (highest score).One setting scored 2 and the other 4 settings scored higher than 6 with one setting receiving a maximum score of 10. At 6 months 2 of the programmes were still being delivered (maintenance). The next chapter will interpret the significance of the main findings.

5 Discussion

5.1 Introduction

This chapter will discuss the findings obtained from Phase I (questionnaire) and Phase II (physical activity interventions in multiple settings and interviews with key setting personnel) of the study. These findings will be discussed with reference to the literature review and possible explanations for findings will be presented. The chapter will provide a recap of the main results and a possible explanation for these. The combined results will be used to provide recommendations for future community based physical activity programmes for older adults. Finally, the limitations of the study are presented.

5.2 Main Findings – Overview of Phase I

The aim of this study was to assess levels of physical activity in older adults and to work with stake holders in multiple settings to enable older adults become more physically active in a sustainable way. Using the Socio-Ecological model as a framework for the study, a questionnaire was prepared and administered to gather data. Questions were organised under various headings to assess PA levels and to capture the levels of the SEM: individual, social environment, physical environment and policy.

At Phase I, the study recruited from a broad range of settings: active retirement associations, choirs, bridge clubs, community groups, family resource centres and Primary Care (General Practitioner) settings. Despite the measures adopted to obtain gender balance in the recruitment for Phase I of this study more females (64%) than males (36%) and more rural dwellers (56%) than urban dwellers (44%) were recruited. Similarly in Phase II, 80% females compared to 20% males were recruited. From analysis of the questionnaires, it emerged that males were more physically active than females which concurred with TILDA (Cronin, 2011). However, at Phase II, more females than males took part in the interventions. There was a broad age difference in those recruited to Phase I of the study – the youngest was 50 and the oldest was 85 years old.

5.2.1 What levels of physical activity are currently being achieved by older adults?

Respondents deemed themselves to be at least as active as their peers and 31% of the sample was active in accordance with recommended guidelines. Cronin, (2011) found that two thirds of Irish older adults report high (34%) or moderate (33%) levels of physical activity. When

asked to estimate the physical activity guidelines, 39% answered correctly on the 150 minutes per week element of the guidelines and it was found that those that knew the physical activity guidelines were more likely to achieve them. Research conducted on behalf of Age & Opportunity examining the participation and attitudes of older people in Ireland towards physical activity and sport found that 42% of older adults had heard of the national physical activity guidelines (Perceptive Insight, 2015). Only 13% could correctly cite them. However, of those 42% that had heard of them, 74% gave a reasonably close estimation of the guidelines (Perceptive Insight, 2015). This makes a good case for further promotion of the PA guidelines. Knox (2013) says that knowledge of physical activity guidelines has increased in recent years. However, physical activity campaigns could do better in promoting health information among disadvantaged population groups, including older adults (Knox, 2013). TILDA found that older adult males are more likely to report high activity levels than women (41% versus 26%) and less likely to report low activity levels (27% versus 40%) (Perceptive Insight, 2015). However, this study found, females are more likely to take part in PA programmes offered.

Phase I results also revealed that, compared to their peers, older adults perceive themselves to be adequately physically active but in reality the majority are not. Encouragingly, 91% of respondents rate physical activity as important and furthermore, 62% said that they intend becoming more active at some stage. These two results reveal the importance older adults place on physical activity and good intention to become more active. Being a member of a club or sporting group is a significant factor in predicting involvement in sport and PA (Perceptive Insight, 2015). The Active Retirement Association of Ireland states that 80% of members are female, 20% are male. Overall, men (50%) are more likely to be members of sports / social clubs than females (42%). Men with low levels of education or income are usually the least likely to engage with health promoting initiatives (Carroll, 2014). Moreover, men are far more likely than women to belong to a sporting club (33% versus 16%) (Perceptive Insight, 2015). Many interventions specifically target settings where men gather and since this study took place, *Men on the Move* has been developed, evaluated and delivered. *Men on the Move* is delivered in settings men are familiar with (GAA clubs, soccer clubs) and this has proven to be a successful ‘hook’ to engage men. It supports men to engage, on their own terms, with a basic physical activity programme including health checks and health promotion (Carroll, 2018).

Performing muscle strengthening activity at least twice weekly is included in PA guidelines for older adults (Nelson, 2007), and also part of physical activity recommendations in Ireland (Department of Health and Children, 2009). Winnett (2009) says that the prevalence of resistance training in older adults is about 10-15% (Winett, 2009). In the United States, the percentage of older adults who met guidelines for both aerobic activity and muscle strengthening activities has increased. The study looked at older adults activity levels from 2000 to 2002 and again from 2013 to 2015 and measured activity across three age groupings (65-74 years; 74-84 years; and 85 years +). In common with other studies there was a marked decline in muscle strengthening activity with age from 19.3% of those aged 65-74 years to 10.4% of those aged over 85 years. In addition to this there was a greater decline in muscle strengthening activities compared with aerobic activities (Morbidity and Mortality Weekly Report, 2016). The belief that resistance training is a difficult activity which requires knowledge (complex techniques), added to the misinformation about its outcomes (women will get 'big') and lack of understanding about initiation and maintenance were given as the reasons for such low prevalence (Winett, 2009). Burton et al (2017) states that only 15% of older adults aged 60+ are meeting the weekly recommended guidelines for resistance training, citing the factors of health issues, pain and tiredness or fatigue, lack of social support and available exercise facilities available (Burton, 2017). Results from Phase I found that sixty one percent had not done any muscle strengthening activities in the previous week. Active older adults in Ireland prefer cycling, swimming, golf, dance and jogging (Murtagh, 2014). Perhaps older adults are not aware of the advantages to be gained from doing muscle strengthening activities? Maybe they do not have the confidence to perform muscle strengthening activities or there is misinformation about the effects of muscle strengthening activities?

5.2.2 What are the perceived barriers and facilitators to older adult participation in physical activity?

The full results of this Research Question are presented under section 4.5 (see Table 8 and Table 10). Being a group member emerged as a facilitator and over half (56%) of those surveyed were members of a group. Surprisingly, none of these groups provided walking as an activity. For older adults, walking outdoors 4 times weekly for fifteen minutes can cut the risk of mortality by 50% (Fortes, 2013). This gap in provision of walking activities was identified as an opportunity for an intervention. This study also revealed that the majority of older adults (91%) have access to a car and that car use is high for transport for leisure,

shopping and visiting. Saelens and colleagues posit that car access is a facilitator of PA as it offers the opportunity to walk in nice environments. It also affords the owner opportunities to seek out independent means of physical activity such as gym and PA classes (Saelens, 2003). Conversely, it has been found that, in addition to not having access to a car, joint pain, perceived lack of fitness, shortness of breath and negative beliefs about the benefits of PA are barriers to PA (Crombie, 2004).

Personal barriers to PA included illness (61%) and disability (37%) and these were cited as reasons for being inactive. However, older adults in the survey felt that having inactive friends or spouse would not cause them to be inactive. Pain and illness are major barriers to PA (Jancey, 2009), but unless pain is preventing the older adult being active, PA should still be promoted irrespectively (Kelleher, 2014). Booth (2002) says that older adults who have access to safe footpaths and park and friends who are already regularly physically active are facilitators for PA. Those surveyed cited lack of time as a reason for being physically inactive. Recent demographic changes in Ireland (greater female participation in the workforce, increase in age of first born, increase in number of lone parents, increase in house prices and cost of formal childcare), means increased pressure on grandparents to fill the gap in childcare provision and this could impact on leisure time (Share, 2009). However, Murtagh et al (2015) found that older adults who do not look after grandchildren are more likely to be inactive than those who do (Murtagh, 2015). At the personal level, another barrier cited was expense (39%). MacNiven et al. (2013) looked at facilitators and barriers to PA in older Australians and found expense to be a barrier and affordability to be a facilitator. However, those who had a more positive attitude towards PA and who reported their health as being good were more likely to engage in 150 minutes of aerobic activity per week despite citing expense as a barrier. The explanation was that while certain activities may be expensive they were achieving PA recommendations in other less expensive ways (Macniven, 2013). The intervention programmes in Phase II were offered to participants either for free or at a reasonable rate. There was greater uptake for the paid for programmes which were offered in more affluent areas than the free programmes offered in less affluent areas.

When considering the interpersonal level of the SEM, results from the questionnaire revealed that having a friend to be active with was the greatest facilitator for physical activity and more so for females. In conjunction with this, 82% of those surveyed had not purchased any equipment in the previous 3 months. This suggests that perhaps older adults prefer to exercise

in a group or social setting as opposed to exercising at home, alone. Future studies should investigate if lack of knowledge about the use of home exercise equipment is the reason for not purchasing home exercise equipment. In a cross-sectional study from 2004, Crombie and colleagues found that those who are not a member of any group and who also doubt the benefits of social interaction (meeting new people) are not likely to participate in PA (Crombie, 2004).

All respondents (rural and urban) were of the opinion that it is not safe to cross the road in their area. Moreover, those who did not meet the physical activity guidelines were more likely to perceive their area as not safe. As might be expected, urban dwellers (compared to rural dwellers), perceive the footpaths in their area to be safer to walk on. This could be seen as a facilitator in urban areas. While urban dwellers were more likely to have access to a gym, very few respondents were keen on being a gym member even if it was conveniently located.

5.2.3 What activities / strategies would older adults like to see implemented to help them achieve the optimal physical activity guidelines?

It emerged that older adults want activities that are specifically suitable for older adults such as walking groups. These were provided in Phase II. One walking group took place on a walking track that had an outdoor gym and is situated at the back of the Community Centre. This had little success probably due to the fact that the walking track is secluded and not well known in the area. The other, took place on a walking track attached to a GAA club and is bright, well used and safe. This programme was more successful. Venue is an external factor that can be a barrier or facilitator – participants are less likely to attend an unattractive venue and more likely to attend an attractive venue (Hawley-Hague H. H., 2014). Furthermore, the results found that having access to suitable venues such as a park, (but not an outdoor gym), were seen as enablers for older adults to increase levels of PA. Additionally, having an instructor in a fun, social setting was another facilitator for PA. All instructors in the interventions were trained PA instructors. Stakeholders specifically were high in their praise of the instructors. Trained PA instructors are likely to help older adults overcome barriers and develop a positive attitude to PA, for example focusing on function, movement and maintenance of independence rather than on ‘exercise’ (Hawley-Hague, 2014).

5.2.4 Main Findings - Phase II – What impact did the physical activity interventions have in increasing physical activity participation among the study participants?

Using cross-promotion and linking with community organisations and groups is also said to be an effective way of recruiting to PA programmes (Deakin University Centre for Physical Activity and Nutrition Research, 2012). From low PA levels, recruiting and retaining participants to newly established programmes/interventions was very difficult and challenging. Despite best efforts by the researcher to link with communities and use personal contacts, results show that reach was low. One of the most reported recruitment strategies is word of mouth and more so when a programme is established. However, the interventions in this research were very short 8-week programmes and would probably have needed more time to become established. Conversely, an instructor led circuit class for older adults, in a rural location in Kilkenny, which is now in its fourth year, started with 6-8 participants. Due to patience, word of mouth and the appropriate marketing of the class, the group has now grown to the stage where it regularly has over 20 participants. Phase I found that older adults would not join a gym (fitness facility) even if it was close by. The incentives offered in the fitness facility such as reduced admission rate and free tea/coffee helped with recruitment to this intervention. From those recruited, most had never been inside the facility before and this suggests that efforts by the facility to reach out to older adults in the area are not adequate.

Promotion for the interventions in all the settings in this study used printed materials, word of mouth and newspaper articles. When recruiting to a new PA programme for low active older adults, merely dropping leaflets, erecting posters and advertising in local media and newsletters in the hope that older adults will attend a new programme is not an adequate method of recruitment. In one of the study settings, community centre staff distributed leaflets door to door, advertised the programme in local newsletter and also encouraged older adults that use the community centre to participate. However, due to staff time pressures, there was no follow up visit. Additionally, both the researcher and the programme were unknown to local residents. In contrast, the successful Groningen Active Living Model (GALM) distributed printed material to 2000 older adults but, significantly, also followed up with home visitations and completion of a Stages of Change questionnaire and the Voorrips PA questionnaire. As a result, GALM, a recreational sports programme recruited 46% men and 54% women which represented 12.3% of all older adults. Of these, 80% were regarded as sedentary. Due to the varied nature of the PA programme on offer, a good gender balance were attracted and recruited to the programme. It is noteworthy to say that this research found

in Rural Setting 2, that having a key reputable, dynamic contact in the community who is willing to help with recruitment and promotion of a new PA programme was a more successful way of recruiting.

In general, walking programmes appeal more to women than they do to men (Stevens, 2008). These numbers recruited by this method in GALM are consistent with other successful studies such as the Elders pilot LIFE-P programme (Katula et al, 2007) and Perth Active Living Seniors (PALS) (Jancey et al, 2006). It highlights the huge amount of time and resources that are needed when trying to increase physical activity levels in older adults. Recruiting one participant to the GALM study in 2008 cost $84 (Stevens, 2008). In contrast, the research reported on here had very limited financial resources. The study relied on the researcher's efforts for goodwill, support and recruitment as well as co-operation from the selected settings in fulfilling their responsibilities. Total estimated research planning and implementation cost was €3,300 (see Appendix H).

In the fitness facility, the programme was not promoted externally due to lack of time of management/staff. Internally, posters were erected but the low numbers recruited is testimony to the fact that low numbers of older adults use the facility. The facility is focussed very much on swim programmes for school going children and adults, teen gym programmes and gym membership and classes for younger adults. However, there is potential to recruit older adults to the facility where the classes took place as it is located in the middle of a residential area. A spin class for older adults which was a successful part of the intervention continues to run. Instrumental in its success is having a special older adult time, giving careful consideration to the music played, proper induction for new participants and provision of free tea/coffee. Additionally, and similar to the example given above, the programme was given adequate time to become established after the intervention.

Access to parks, safe footpaths and recreational facilities are factors that encourage physical activity. Having free public transport means older adults are more likely to walk further than those who do not have free passes (Taylor, 2014). The introduction of a new public transport system in Kilkenny which incorporates stops at the fitness facility represents an opportunity for the facility to encourage older adult usage. Having public transport can make the environment more favourable to the needs of older adults (Gray, 2012).

5.2.5 Role of the leader / instructor

Having a key organiser / community lead person is one of the major ingredients to the success of a group physical activity programme. One of the groups in this study (Rural Setting 2) had a reputable community leader who organised everything for the group – promotion, management of community centre bookings, liaison with the instructor, payment of instructor and for hall, community centre set up and communications with participants. This person was central to the success of the intervention and was a PA role model for other members of the group. However, when this person decided to relinquish these duties, nobody in the group was willing to commit to the duties.

Another significant facilitator to PA in older adults is instructor trust. This emerged in Rural Setting 1 – the programme was successful under her leadership and the older adults liked her. However, when the instructor could not commit to continuing the activities due to personal circumstances the programme ceased. Lack of suitably qualified PA practitioners in the area meant the programme did not recommence. Moreover, the group did not seek to independently recruit a replacement. In Community Centre 2, the chair based exercise class was delivered free of charge by a Health Promotion student who developed a trust and affinity with the older adults. The group were very low active and it was quite a success to have them participate. However, the programme was not continued when the intervention ended as no other instructor was available free of charge and setting staff were not adequately trained for programme delivery. Neither did they have the time to continue delivery of the programme. Both cases highlight that developing instructor trust and affinity with older adults is important and warrants further investigation but this was beyond the scope of this study.

It is noteworthy to say that all settings were willing to take part in the intervention studies and help with the provision of PA opportunities for older adults. However, the commitment of resources to sustain the programmes was less forthcoming. Staff time, particularly in community settings is scarce. The community settings in the study appeared to be under resourced with staff time being split across a huge variety of programmes and population groups. In rural settings, not just in the intervention, but also in general, the role of volunteer leaders to seek instructors, promote, recruit and manage programmes is the reason PA programmes for older adults run in the settings.

5.3 Paying for physical activity

Results from Phase I of this study found that older adults place a high value on PA, however, there appears to be a threshold cost above which they are not prepared to pay. The walking programme which was part of the intervention in Rural Setting 1 was delivered free but subsequently discontinued as the local GAA club introduced a club membership charge of €50 for those (including older adults) using the walking track. The purpose of this was to increase club membership. However, the effect it had was to deter older adults from using the walking track and subsequently from joining their local club. This comes at a time when, at national level, the GAA is promoting the Healthy Clubs project which aims to transform clubs into health-promoting settings and provide communities with opportunities to be physically active. Many clubs have taken the initiative to provide walking tracks for members. If access to such walking tracks was provided without charge for older adults (many of whom are on limited incomes), it might help improve PA levels in older adults in their local club setting. It might also lead to the 'significant and lasting improvements to the health of communities across Ireland' (Gaelic Athletic Association, 2018).

The programmes (walking and chair based exercises), which were provided free of charge in areas of social disadvantage did not achieve high levels of Maintenance under the RE-AIM framework. Conversely, where the interventions took place, more affluent areas had paid for programmes and older adults in these areas were willing to pay. Those of lower SES, in less affluent areas, were less willing to pay for PA, were harder to recruit and engage with. The fitness facility had discounted gym access which included instructor and complimentary tea/coffee. These programmes showed better levels of sustainability and concurs with Li & Fisher (2005).Individual characteristics such as higher income and higher educational attainment are influencers on sustained PA. Those who can afford to pay for programmes are more likely to sustain participation (Li, 2005). Further research is needed to understand threshold values for PA in older adults. Giving OAs free access to PA does not guarantee recruitment to programmes or sustainability of programmes either.

There were low numbers of pre and post surveys to analyse because of the low numbers recruited. This was particularly so in the fitness facility because of lack of communication between staff on different shift patterns and lack of clarity from the researcher at the commencement of the programme. However, good qualitative data was gathered from interviews with the key person in each setting. Overall, the programmes reached the target

audience, were well received and the key stakeholders in each setting were very satisfied and wished for the programmes to continue. The setting that did not fulfil the adoption element of their intervention was not asked to contribute to this data as questions were specific to involvement in the intervention. Their stated reason for not taking part was due to lack of staff time to support the intervention.

5.4 Recommendations

An ageing population presents a potentially large market for fitness facilities. Furthermore, new fitness facilities have recently opened in the area, presenting increased competition. Future recommendations for the facility would be to raise awareness with management and staff about the size of the market they are potentially missing out on by not assertively recruiting older adults. While affordability of gym membership may be an issue for older adults on low incomes, it should be investigated what factors, in this study alone, would prevent 54% of older adults from joining a gym even if they had access to one. A recommendation would be for management and staff to visit older adults in leisure settings similar to those used in this study and carry out demonstrations of classes and offer incentives such as special programmes like the one in the intervention and perhaps discounts for memberships. Furthermore, staff could be given additional training on older adult members needs in terms of assisting them with equipment and assessing what their needs and fitness goals are.

At policy level in fitness facilities, there needs to be a top-down commitment to a long term, real audit of facilities, practices, staff; investment in capacity building; patience to allow new programmes to bed down. Future research might investigate what percentage of fitness facility memberships are made up of older adults compared with general populations. Then, policy could be introduced which would insist that all local authority fitness facilities have a minimum older adult membership level similar to the way new housing estates have a required percentage of social housing. This might have the effect of compelling fitness facilities to be more proactive in recruiting older adults and thus reduce inequity in PA take up and increase the numbers of older adults who are active.

Many community-based PA programmes for older adults run as 8 week programmes and typically finish early December and do not recommence until early January. Similarly, programmes end in mid-May and do not recommence until September. Physical activity needs to be promoted as a lifestyle – active every day, every week, every year - and not just a

'programme' to attend or endure once or twice weekly for 8 or 10 week periods. Community setting staff and community leaders that run PA programmes in community settings would benefit from education and training similar to the PALS training which would allow them to be insured to facilitate their groups in their own setting.

When considering the interpersonal level of the SEM, results from this study suggested that being a member of a group was a facilitator for PA. Group members place a higher value on physical activity and are more likely to be active (and achieve some of the physical activity guidelines). They are also more likely to have been active in the previous 6 months and more likely to be doing muscle strengthening activities. Van Pelt (2010) argues that exercising in a group setting versus individual setting is attractive to many but it does not have any additional physiological benefits. In Ireland, national group activity programmes such as *Get Ireland Walking* and *Men on the Move* recruit significant numbers of older adults to organised PA. They provide further evidence that group activity has a positive effect on increasing PA levels. For example, a pilot study, *Men on the Move* recruited men up to 65 years and 26% of those recruited were over 54 years. At outset 83.7% of men were not happy with their physical activity levels. The programme, has helped men increase their physical activity levels and also promoted social integration for men (Canavan, 2013). The *Men on the Move* programme includes physical activity in a social setting, nutritional talks and health checks. Results in this study showed that at 90%, car access is high among older adults to the detriment of walking for social visits, shopping and leisure. *Get Ireland Walking* seeks to promote walking as a health promoting activity and provide 'increased walking opportunities for all member of society' (p.11, Sport Ireland, 2017). Ways of doing this will be by expanding the number of walking groups, promoting walking for transport and exploring the use of leisure facilities as sports hubs. The strategy seeks to include all in society especially those who face depravation either socially, economically or educationally and the strategy includes older adult agencies as stakeholders. Efforts should be made to increase the number of older adults availing of programmes such as *Men on the Move* and *Get Ireland Walking*.

In 2013, the Department of Health published *Healthy Ireland, A framework for improved health and wellbeing 2013-2025.* The aim is to increase the proportion of people who are healthy at every stage of life. There is a commitment to increase PA levels, especially those from marginalised groups, across Ireland (Healthy Ireland, 2013). While the framework is a 12 year plan, roll out has seen hurried funding applications, tight deadlines for staff

recruitment and a three month window for programme completion. While the funding is particularly welcome, such unrealistic timeframes place partner agencies under enormous pressure for programme delivery. REAIM is a particularly useful framework for planning and evaluating a PA programme. However, due to restraints such as those mentioned above, the programmes will have little or no evaluation component incorporated which means critical information such as reach, effectiveness, adoption, implementation and maintenance will not be available. Such information, would, in turn be useful in allocating resources and planning for future programmes for the fast growing older adult population.

The National Physical Activity Plan (NPAP), published in 2015, focuses on immediate and long term actions to target behaviour change and increase the proportion of the population engaging in regular PA by 1% per year. It seeks to overcome barriers to participation in marginalised groups such as older adults. Those who fail to engage in PA programmes are those who face socio-economic barriers such as low educational attainment and neighbourhood deprivation. NPAP seeks to provide counselling on PA as part of primary health care services. It also seeks to include monitoring of PA levels in the national health monitoring systems (Healthy Ireland, 2013).

The results of this study demonstrated that there is scope for the recruitment of specialist older adult physical activity practitioners to provide group activity classes in suitable community settings. These physical activity practitioners should also be able to provide education for older adults regarding physical activity and also make the activities fun and beneficial**.** Kahn (2002) says that community based programmes combining an education element with mass media promotion combined with physical activity are effective in increasing levels of physical activity (Kahn, 2002). This study agrees with Kahn (2002) but with the addition of having programmes that run over a longer period with an opportunity to become established.

5.5 Limitations

Despite a good response to Phase I of the study (300 questionnaires), the number of participants recruited to the intervention was small. Lack of participation in physical activity programmes can be partly explained by either attrition at recruitment stage or, programme attrition or relapse among those effectively recruited to the programme (Prochaska, 2000). Given the documented difficulty in recruiting and retaining people to new physical activity programmes, perhaps, it would have been better to focus research and resources to deliver

one or two concentrated interventions instead of five across different settings. The homogeneity of older adults was apparent too. This research included older adults aged from 50 years up to 85 years in Phase I. Future studies might group older adults into subgroups, for example, 50-65, and those older than 65 years. A further limitation of the study is the use of self-report data (used in Phase I and in Phase II). Small numbers were recruited to Phase II of the study and this can have an effect on the statistical results in the study. The study was of relatively short duration to affect real behaviour change. It takes about 66 days to form a new habit (Lally, 2010). The commencement and maintenance of physical activity is a combination of social, physical, biological and environmental factors. It takes time for behaviour change to be adopted. The determinants and barriers to physical activity are many and varied they will have been embedded across the lifespan – more so in an older adult (Uphill, 2014). Despite best efforts to control for at recruitment stage, there was a male / female and rural / urban imbalance in the sample. Finally, the Mass Media Campaign was not evaluated.

5.6 Conclusion

Despite all the evidence and efforts to increase PA levels among older adults (older adult specific classes in swimming and aqua aerobics, Go For Life games, PALS workshops etc.), participation rates remain stagnant (Donoghue, 2016). Two thirds of Irish adults over 50 report low or moderate levels of PA (Donoghue, 2016). Knowledge of the barriers (personal, interpersonal, environmental and policy) allows for multi-faceted, strategic planning to increase older adult PA levels. Burton (1999) states that older adults are likely to associate PA as being uncomfortable and vigorous. Many still believe that it has to be like that in order to accrue any benefits and this is often a deterrent for many (Burton, 1999). Also, older adults perceive that they have a lack of skill to be physically active and this is often a barrier to them participating (Craig, 1998). In summary, careful consideration needs to be given when trying to convince older adults that physical activity is worthwhile for physical, functional and mental health (Stathi, 2014). The idea of retirement is associated with relaxing and taking it easier. Additionally, many older adults believe they are too old for physical activity (King, 1992). Results from Phase I of this study found that older adults are aware of the need to be active and indicate intent to be active at some stage. However, sedentary older adults are difficult to recruit and engage with as this study demonstrated. Across all income groups and all countries, physical inactivity is the one of the leading risks for mortality (World Health Organisation, 2009). However, the risks posed by tobacco use, alcohol use and high BMI

have been well promoted for some time now. It would be interesting to see the consequences of physical inactivity for older adults promoted in a similar way to the consequences of tobacco and alcohol use.

Faced with an increasing burden of chronic disease, promotion of healthy lifestyle for older adults is increasingly important. The concept of active ageing should be promoted more vigorously and with more emphasis on being physically active every day, every week, and every month. GPs, nurses and other health professionals should be equipped to capitalise on opportunities that happen each day to prescribe PA guidance and advice in a more effective way. *Making Every Contact Count* seeks to reduce the burden of chronic disease by promoting health lifestyle – including physical activity (Health Service Executive, 2016). It has been found that messages promoting PA need to be coherent, consistent, simple and clear and should come through many channels appropriate to age, culture and gender (World Health Organisation, 2008). A summary of evidence from a systematic review shows that PA interventions in a group setting using existing social structures and meeting places are most effective, but these require long term support and commitment from management with realistic budgets as well as a commitment to build the capacity of the local workforce (World Health Organisation, 2008).

6 References

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7 Appendices

Appendix A - Letter to Gatekeepers for Community Groups / Active Retirement Groups

Waterford Institute *of* Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

Dear Sir / Madam,

I am a Research Masters student at Waterford Institute of Technology. I am doing a study which will look at some of the things that enable some adults to be sufficiently physically active and what might prevent others from being as physically active.

As part of the study I need to recruit around 300 people and ask them some questions about their own levels of and, attitudes to physical activity. Therefore, I am requesting permission access to members of your club at a time which is convenient for you, during one of your meetings.

I will begin by explaining to them the purpose of the study. The decision to take part or not is completely voluntary. Participation will only be allowed with signed, informed consent, which I will explain to them. I would then like them to take a few minutes to complete a questionnaire (5-10 minutes maximum).

There is an area on the questionnaire which invites participants, if selected, to be part of a focus group discussion (to further explore the topic) and another area which offers them an opportunity to be part of one of the interventions which are planned. Only if they wish to be part of either of these elements of the study, will they be asked to supply their name, address and contact number. This information and all the data collected in the questionnaire will remain strictly confidential (stored securely and password protected) and will only be seen and accessed by the Researcher (Seamus Nugent) and his two Supervisors (Dr Niamh Murphy and Dr Mary Cowman).

The participants will have the option to withdraw from the study at any time without any consequence.

Thank you for taking the time to read the enclosed information.

Kind regards

Seamus Nugent

Postgraduate Student

Centre for Behaviour Research, Waterford Institute of Technology

Cork Road Campus,

Waterford.

086-1057428

Supervisors: ***Dr Niamh Murphy and Dr Mary Cowman***

Centre for Health Behaviour Research, Department of Health, Sport and Exercise Science

Waterford Institute of Technology

Waterford

Appendix B - Consent for Informed Participation in Research - Questionnaire

Waterford Institute *of* Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

Consent for Informed Participation in Research - Questionnaire

Enabling quality, sustainable physical activity change in adults – a study of barriers, facilitators and interventions

I agree to voluntarily answer a questionnaire which will be used to gather data for a research project. It will be conducted by Seamus Nugent, Research Masters student at Waterford Institute of Technology. He has explained to me that the aim of the study is to explore factors affecting physical activity participation. I will be one of approximately 300 people who will complete questionnaires for this research.

1. My participation in this project is voluntary. I understand that I will not be paid for my participation. I may withdraw and discontinue participation at any time without penalty.
2. I understand that the researcher will not identify me by name in any reports using information obtained from this questionnaire, and that my confidentiality as a participant in this study will remain secure. Subsequent use of records and data will be subject to Data Protection Policy which protects the anonymity of individuals and institutions.
3. I understand that this research study has been reviewed and approved by the Ethics Committee of Waterford Institute of Technology.
4. I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.
5. I have been given a copy of this consent form.

My Signature…….. Date ……...

My Printed Name …….....

Signature of the Investigator ……

Appendix C - Instructions for participants in Phase I and Phase II Questionnaire

Waterford Institute *of* Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

Instructions to be read to all participants prior to completion of Phase I and II Questionnaires

1. Hello, my name is Seamus Nugent and I am a student in Waterford Institute of Technology. I am conducting a study about physical activity and older adults. Thank you for agreeing to complete this questionnaire. The questionnaire is being used to explore factors affecting physical activity in older adults; perceived barriers and facilitators to participation in physical activity. The results will be used to devise activities and strategies that might help increase long term physical activity in older adults.
2. Please use the pen provided to answer the questions as honestly as possible. Remember, there is no right answer or wrong answer.
3. The questionnaire should take 10-15 minutes to complete. However, there is no time limit on completing the questionnaire.
4. Some of the questions have multiple choice answers. Choose only one answer.
5. If anybody has any difficulty in reading or understanding any part of the questionnaire, please raise a hand and the researcher will assist you in reading the question.
6. Your answers will remain confidential. The completed questionnaires will only be seen by the researcher and his supervisors.
7. Participation in this research is entirely voluntary and you can choose not to participate or withdraw at any stage.

Appendix D - Consent for Participation in Physical Activity Research

Waterford Institute *of* Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

I agree to voluntarily take part in a physical activity study which will be used to gather data for a research project. It will be conducted by Seamus Nugent, Research Masters student at Waterford Institute of Technology. He has explained to me that the aim of the study is to explore factors affecting physical activity participation.

1. My participation in this project is voluntary. I understand that I will not be paid for my participation. I may withdraw and discontinue participation at any time without penalty.
2. I have completed the PARQ form honestly
3. I consent to voluntarily engage in physical activity at an acceptable level. I will monitor my own physical condition throughout and, if I feel uncomfortable or experience any unusual conditions during the session, I have the right to stop.
4. I assume full responsibility for my participation in the physical activity sessions.
4. I understand that the researcher will not identify me by name in any reports using information obtained from these physical activity sessions, and that my confidentiality as a participant in this study will remain secure. Subsequent use of records and data will be subject to Data Protection Policy which protects the anonymity of individuals and institutions.
5. I understand that this research study has been reviewed and approved by the Ethics Committee of Waterford Institute of Technology.
7. I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.
8. I have been given a copy of this consent form.

My Signature…….. Date ……...

My Printed Name …….....

Signature of the Investigator ……

Appendix E – Setting and Target Group

Multimedia Campaign A

Education and awareness raising using local newspapers
9 x 350 word articles
Education and awareness raising using local radio infomercials
9 x 30 second infomercials

INTERVENTION

8 week topic guide newspapers (*See Appendix E for article content)

1. Get Active Now! – helping over 50's to be more active. (Published 14/10/15)
2. How to be more active if you're over 50. (Published 21/10/15)
3. Walking your way to health. (Published 28/10/15)
4. Opportunities galore to be more active. (Published 4/11/15)
5. Excuses and how to overcome them. (Published 11/11/15)
6. The weather – an excuse for being in active? (Published 18/11/15)
7. Phone a friend and Get Active Now! (Published 25/11/15)
8. Consistency is the key – Get Active Now! (Published 2/12/15)
9. Pre-Christmas reading – Get Active Now! (Published 9.12/15)

RECRUITMENT METHOD

The researcher contacted local media (newspapers and radio) to set up meetings to discuss the study. The need for publicity for the interventions and the awareness raising element of the study was discussed. The editors of both newspapers agreed enthusiastically to publish the articles. The radio station manager initially agreed to record and air infomercials which would both publicise the interventions and have an awareness raising element. The radio infomercials agreement fell through. The radio station manager felt that having infomercials about a PA programme for older adults would not be targeting the desired age profile of the station and that they would adversely affect listener ratings.

RATIONALE

Increase knowledge of guidelines and need to be physically active publicise interventions which would help achieve this.

EVALUATION METHOD

Articles will have email / telephone number and readers will be invited to make contact to get advice or comment on the interventions or any aspect of physical activity for older adults.

Setting and Target Group –

Multimedia Campaign B

Information Leaflet

2000 copies printed

INTERVENTION

Distributed to programme participants, GP surgeries, pharmacies, intervention venues, Phase I respondents, clubs and groups in area.

RECRUITMENT METHOD

Leaflets were distributed to coincide with the start of the physical activity interventions and the publication of newspaper articles – November 10th to November 24th, 2015.

RATIONALE

Older adults and GP's have been found to be unsure of physical activity guidelines. Aim of booklet is to help educate older adults and GPs of PA guideline, motivate them to become active, advise them how to achieve this and inform them of activities that are available in their area.

Older Adults who received GP advice re PA more likely to be active compared to those who did not (Noordman, 2010).

EVALUATION METHOD

- Number of booklets distributed compared to the number of booklets remaining at end of intervention.

Setting and Target Group – Fitness Facility

Facility with ‘pay as you play’ policy. Hotels are membership only and were not open to an intervention when approached.

The Fitness Facility was open to accommodating the programme with a view to increasing their older adult membership and the number of older adults ‘casual’ facility users.

The facility would supply trained staff to facilitate the programme.

INTERVENTION

Special Older Adult gym membership was offered. Three specific programmes designed for older adults:

- Walk programme
- Gym based programme of weights, modified resistance for lower capacity older adults
- Indoor cycling (adapted spinning)

As part of the programme, participants will be given:

- a designated instructor
- their own special hours
- a separate gym (away from main gym)
- induction session for building layout (toilets, showers, equipment, equipment use, gym etiquette)
- age appropriate music

Cost: €3 per session includes tea/coffee.

DATES

12/10/15 – 30/11/15 (Mondays)

14/10/15 – 2/12/15 (Wednesdays)

16/10/15 – 4/12/15 (Fridays)

TIME

Mondays, Wednesdays, Fridays between 11am and 1pm. Gym will be available to older adults during these 2 hours.

RECRUITMENT

- Recruitment of 20 members (maximum) from membership databases of current and past members of the facility.
- Facility staff / management meeting with local clubs, parish groups and active retirement associations.
- Internal promotion using posters in reception, coffee dock and viewing areas

RATIONALE

- 56% of older adults were group members. Only 23% of these used a gym. Also, 53% expressed an **unwillingness** to join a gym. Therefore, the need to boost image of gym membership to older adults
- Increase numbers of older adults doing muscle strengthening activities was identified - (37.3% currently engage).
- Low levels of PA both in older adults observed (3 sessions in gym may help older adults achieve guidelines);
- Importance of social element in PA (tea/coffee afterwards)
- Need for a friendly instructor in a fun environment (80.7%); gym / circuits were highly rated as activity of choice in groups that are physically active.

EVALUATION

Swipe in / swipe out system of measuring attendance.

RE-AIM framework to measure the results of the programme across the 5 elements

Qualitative interview with key staff member (as per other settings)

Setting and Target Group – Rural Setting 1

A rural setting was chosen because in Phase 1 of the research rural dwellers, defined as those living outside the built up areas of towns or villages, accounted for 55.7% of the sample. During the analysis of results from Phase I, it emerged that there were significant differences between urban and rural older adults.

INTEVENTION

Two programmes

- Walking programme
- Strength and balance training

Walking track beside GAA pitch and local parish hall were given free of charge. Hall was to be used if weather is bad on walking night.

DATES

13/10/15 – 1/12/15

15/10/15 – 3/12/15

TIME

Tuesday morning 11am for 1 hour

Thursday night 8pm for 45 minutes

RECRUITMENT

Programme were advertised in the Parish newsletter for two weeks before the start date; former walking group members were contacted by text message; parish hall / church porch posters advertised the classes; local active retirement / day centre group leaders agreed to promote the programme in their meetings.

RATIONALE

Phase I results showed low levels of OA's walking; need for safe place to walk; the need for good access to public parks; need for social aspect (parish group); need to increase numbers doing muscle strengthening activities; group to be led by fun instructor;

Free PA programme as expense was cited as a barrier by 38% of respondents in Phase 1

The safe walking paths / suitable facilities in their locality would help increase PA levels.

EVALUATION METHOD

RE-AIM framework across the five elements

Qualitative interview with key staff member (as per other settings).

Setting and Target Group – Rural Setting 2

INTEVENTION

Hall based circuit training with warm-up, circuits and stretch / flexibility and cool down to take place in Parish Community Centre.

DATES

2/10/15 – 29/10/15

TIME

Friday nights at 7.30pm

RECRUITMENT

Programme advertised by community leader in Parish newsletter and in Parish notes in local newspaper.

RATIONALE

Low numbers of older adults doing muscle strengthening exercises - increase numbers doing muscle strengthening activities; group led by fun instructor in their own locality.

EVALUATION METHOD

RE-AIM framework

Qualitative interview with key staff member (as per other settings).

Setting and Target Group – Community Setting 1

There are many groups in this area but none of them are providing physical activity. The Men's Action Group provide boccia and bowls but this is very low intensity exercise. The Kilkenny Men's Shed provides information about healthy eating and about being active but they do not have a physical activity programme for members. Furthermore, the local Community Centre does not have a PA programme for older adults.

TIME

Wednesday morning 11am – walk and introduction to use of outdoor gym.

INTERVENTION

Led by PALS trained older adult and students from Department of Health, Sports and Exercise Science, Waterford Institute of Technology. Local PALS leader wants to gain some experience putting the training received to use in the area.

Two intervention activities

- Walking programme
- Resistance training using outdoor gym

A couch to 30 minutes walking programme was designed accompanied with some resistance exercises using the outdoor gym. The group were low active.

DATES

16/10/15 – 4/12/15

14/10/15 – 2/12/15

RECRUITMENT

Recruitment through Kilkenny Men's Shed Group, MAN (Men's Action Network), Community centre facilities, Older Adult Befriending Service database, leaflet local houses; participants in Men on the Move physical activity research study.

RATIONALE

MAN group meet once a week but none of them are meeting the physical activity guidelines. Men's Shed currently has no PA element in their programme. There was walking track in the

area, which was away from traffic and was not being used. Results from Phase 1 indicated a need for a safe place to walk as important for physical activity. There was an outdoor gym on the walking track and it was not being used either – 35% of those surveyed in Phase 1 said an outdoor gym would help them become more active.

Both the walking track and outdoor gym were in a densely populated area (www.pobal.ie). Participants in Phase 1 cited ‘having suitable facilities near me’ and ‘safe walking paths’ as strategies that might help to increase physical activity. Low numbers of people are walking for exercise. Furthermore, groups who provided activities did not include walking among its activities for members.

EVALUATION METHOD

RE-AIM framework across the five elements

Interview with key person (stakeholder)

Setting and Target Group – Community Setting 2

Some of this group were active and took part in gentle walks in the area. Some were low active and need to increase activity but needed special consideration to help them achieve PA guidelines.

INTERVENTION

Two Intervention activities:

- Walking programme
- Balance training; chair based exercises that participants can learn to do at home especially for those with disability or recent illness.

The Local Fen was suitable to host the walking group on one day per week. Room booked in centre where group received instruction on use of resistance bands, balance exercises on one day per week which would help them to do the exercises at home.

Existing group walks regularly. Members of this group were asked to recruit a friend / family member to walk with them. However, many have clinical conditions (arthritis, angina, diabetes type II) and were classed as low active. They needed special consideration. Exercise leaders needed to plan activities accordingly.

DATES

13/10/15 – 1/12/15
15/10/15 – 3/12/15

TIME

Tuesday morning 11am for 45 minutes (walking)
Wednesday mornings at 11am for 45 minutes (balance exercises and chair based exercises).

RECRUITMENT

There are 3 older adults' activity groups in the centre. Leaflet drop to local houses inviting older adults to come along to the group; parish bulletin advertisements in the 2 weeks prior to the start of the intervention; posters in the family resource centre and talk with the groups to personally invite them to attend and to bring a friend.

RATIONALE

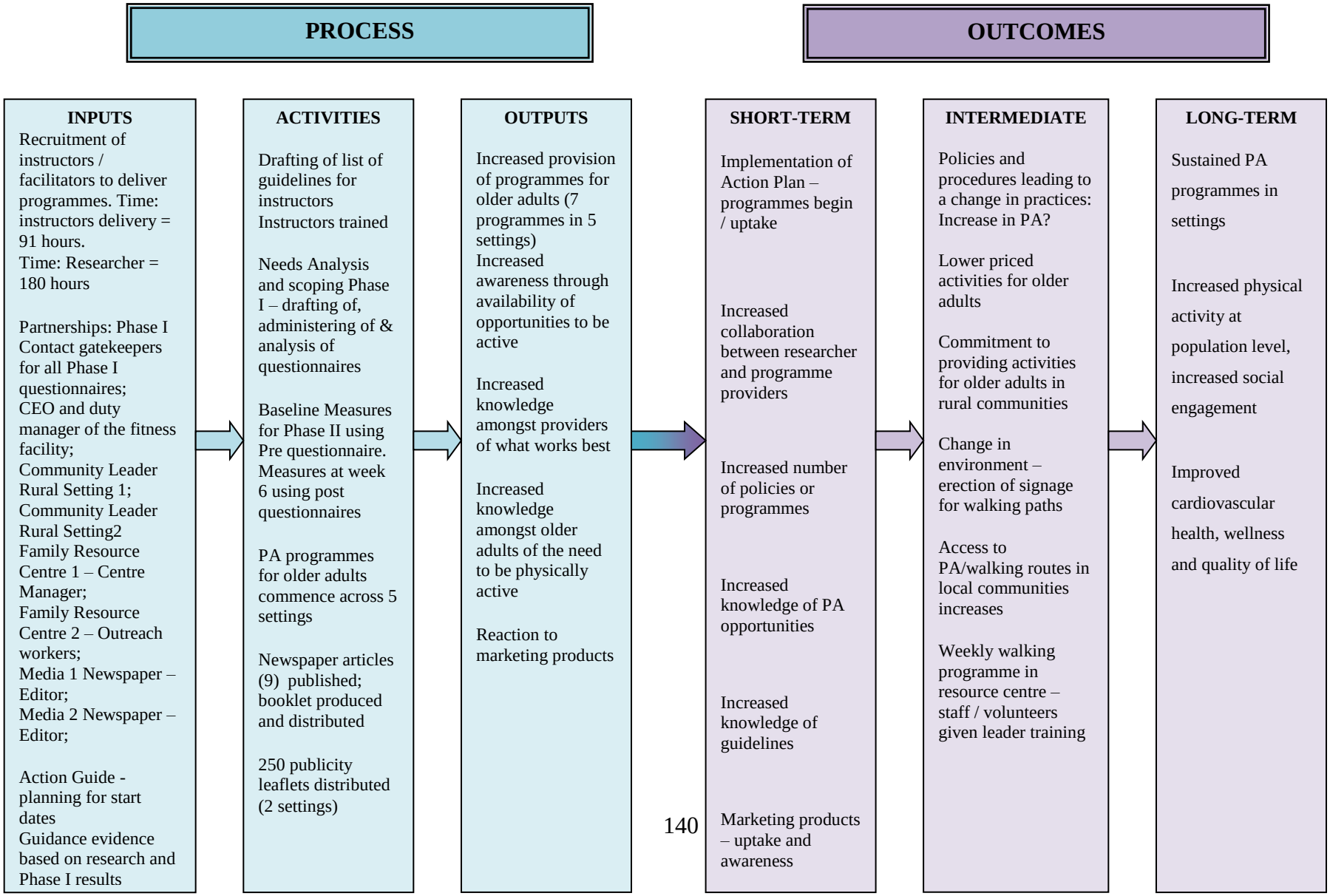
There were facilities (a fen and wide footpaths) for walking in the local area. Results from Phase 1 showed that there were low numbers of older adults walking; also, groups not providing walking activities for older adult members. Research shows that balance exercises for older adults are an important way of preventing falls in later life. Having somebody to exercise with was rated as important by older adults in Phase I.

EVALUATION METHOD

RE-AIM framework across the 5 elements

Qualitative interview with community centre manager.

Appendix F Logic model used for the study.



Appendix G

9 Published Newspaper Articles

Week 1

Get Active NOW! Helping to get over 50's more active

Seamus Nugent, Research Masters Student, Department of Health, Sport & Exercise Science, Waterford Institute of Technology.

You have probably heard that physical activity is very good for you. It is recommended that people aged 65 years and older get at least 30 minutes of physical activity each day. Current research shows that 69% of older adults in the region are NOT meeting these guidelines. However, 80% of those surveyed believe they are adequately active, when in fact they are not.

The good news is that our life expectation has increased - the life expectancy of an Irish man is now **78.7 years**, while for women it is **83.2 years.** When questioned, this is what older people say is most important for them as they get older:

- To be pain free
- To be able to get out and about
- To be independent

Staying physically active and exercising regularly can help you to do the things that are important to you for longer.

This article is one of a series of articles that will be published over the next few weeks. These form part of a Waterford Institute of Technology research project which hopes to raise awareness about the need to be more physically active. There are many things that inhibit how active we are. However, there are also many things that can help us become more active, many of them free or inexpensive and right on our doorstep. They are taking place in Kilkenny over the next few weeks.

Concurrent with this article there are a series of physical activity projects being delivered in the Kilkenny area aimed at getting people a little more active gradually. Everybody over 50 years is invited to take part in them. Lots of friendly support will be central to each programme which will take place in safe environment and most of which are free.

Type of Activity	Venue	Time	Start Date
• **Walking – suitable for all abilities / levels** • **Hall (circuits) suitable for all abilities / levels**	Clara Walking Track & Parish Hall	Tuesday morning 11am Thursday night 8pm for 45 minutes	**Tuesday October 20th** **Thursday October 22nd**
• **Walking – couch to 3k – suitable for all levels** • **Outdoor Gym Learn to use equipment. Suitable for all participants**	Fr McGrath Centre Walking Track	Wednesday morning 11am – walk and introduction to use of outdoor gym	**Wednesday October 21st**
• **Walking – gentle walk session suitable for all** • **Hall *(chair based activities for low active)***	Meet at Newpark Close Family Resource Centre Chair based exercises will take place in the hall	Tuesday morning 11am for 45 minutes Wednesday mornings at 11am for 45 minutes	**Tuesday October 20th** **Wednesday October 21st**
• **Circuits / Pilates. Suitable for all (adaptations and progressions**	Danesfort Community Centre.	Fridays 7.30pm to 8.3pm	Friday nights at 7.30pm

will be shown)			
• **Gym – introduction for all to the gym** • **Walking – for all** • **Indoor Cycling** ***For all abilities***	The Watershed, Bohertounish Road, Loughboy.	Mondays, Wednesdays, Fridays between 11am. Gym will be available to older adults during 2 hours.	**12/10/15 – 30/11/15 (Mondays)** **14/10/15 – 2/12/15 (Wednesdays)** **16/10/15 – 4/12/15 (Fridays)**

ALL of these sessions are open to EVERYBODY. If you have any queries on any aspect of these events please contact Seamus on 086-1057428 or email seanug64@yahoo.ie

Week 2

How to be more active – if you are over 50

Seamus Nugent, Research Masters Student, Department of Health, Sport & Exercise Science, Waterford Institute of Technology.

Approximately 63% of older adults are not meeting the guidelines for being active. Also, as we age we are less likely to be active – those who are over 75 are 21/2 times more likely than those aged 60-64 to be sufficiently active.

Physical activity does not have to be about running marathons, winning an All-Ireland or playing sport at a high level. We can be adequately active by just walking - to and from work, when visiting family, friends or neighbours, shopping or going for a stroll in the local park. The main thing is that we are active regularly. The effort we put in should be enough to get us slightly out of breath and use the main, big muscles in our body. Here is a brief description of what we should be doing.

Aerobic activity (such as brisk walking, aqua aerobics, cycling, swimming or dancing) uses large muscle groups and should be done for 30 minutes 5 times per week (or 2 bouts of 75 minutes if you exercise more vigorously). It can be done in smaller bouts of 10 minutes too.

Tip – Think about the amount of effort you are using to do the activity on a scale of 0 to 10, with 0 representing lying down at rest and 10 representing an effort that can't be sustained. **When your effort is 5 on the scale, you are at a moderate intensity.**

Resistance or weight training should be done be twice weekly in order to keep our muscles functioning well. Lifting light weights, using resistance bands or using bodyweight (push ups, sit ups) are all forms of resistance training. This should be done twice per week.

Balance exercises such as standing on one foot, walking heel to toe, Tai Chi have all been shown to prevent falls. Falls are very common in older adults and can lead to loss of independence and a decrease in quality of life.

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• **Gym – introduction for all to the gym** • **Walking – for all** • **Indoor Cycling *For all abilities***	The Watershed	Mondays, Wednesdays, Fridays between 11am. Gym will be available to older adults during this 2 hours.	**12/10/15 – 30/11/15 (Mondays)** **14/10/15 – 2/12/15 (Wednesdays)** **16/10/15 – 4/12/15 (Fridays)**

Being part of a group of people who exercise regularly is a great way to have fun, meet friends and at the same time be active. All of this contributes to a better, healthier (both physically and mentally). It ensures that as add years to our life, we can add life to our years. There are groups established in and around Kilkenny aimed at helping and supporting those over 50 to become a little bit more active. These groups are open to all. Most are free.

Week 3

Walking your way to health

Seamus Nugent, Research Masters Student, Department of Health, Sport & Exercise Science, Waterford Institute of Technology.

The older we get the less we walk. The older we get, the more important it is to be active. A study has found that those who walk four times a week for at least 15 minutes each time live longer.

Walking raises your heart rate which means that your blood pumps faster around your body and this is good for your heart and circulatory system. It can also help you to control high blood pressure which is one of the causes of strokes.

The more steps we take each day the better for our health - walking and being more active can help cut the risk of type 2 diabetes, some cancers as well as helping maintain a healthy weight. Walking helps us to increase the amount of muscle and the tone of muscle in our bodies.

Furthermore, walking is a weight-bearing exercise which means it can strengthen bones and increase their density. This is important especially for women. It also helps to maintain healthy joints and can help prevention of ailments such as arthritis.

Being active helps boost your energy and makes you feel alert and alive. Studies show that regular exercise such as walking can release feel good chemicals called endorphins into our bloodstream. These help reduce stress and anxiety and can also be effective as antidepressants for those suffer from mild / moderate depression.

However, if you have not exercised for a while you may be a little short on motivation. This article is part of a project to help increase physical activity in those over 50 years. Why not come out and join one of the walking groups in Kilkenny that now up and running as part of this project. They're all free – 38% of those surveyed recently cited expense as a barrier to being physically active.

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You can bring a friend or relative. The walking groups take place in a social, fun environment with leaders. You can get more information or chat about any element of these projects with Seamus on 086 1057428 or email seanug64@yahoo.i

Week 4

Opportunities galore to be active!

Seamus Nugent, Research Masters Student, Department of Health, Sport & Exercise Science, Waterford Institute of Technology.

One of the many excuses for not being physically active comes from the perception that there is nothing suitable on in the area at the right time and on the right day. Through this project that no longer is the case! This week I present a list of some of the activities available in various areas, indoors and outdoors, at various times and days of the week.

Watershed – Mondays, Wednesdays and Fridays from 11am to 1pm. Take part in a walking group, gym session or indoor cycling in a specially designated gym area with a trained instructor. Small charge plus enjoy a FREE tea/coffee afterwards and a chat.

Clara Parish Hall – Thursday nights at 8pm let Miriam take you through a fun exercise session suitable for all levels of fitness. On Tuesdays at 11am there is a walking group in Clara which meets at the walking track at the GAA pitch.

Newpark Family Resource Centre – why not join this group each Tuesday morning at 11am as they build up to walking for 30 minutes around the picturesque Newpark Fen? Then, on Wednesdays, the Nifty Fifty group do chair based exercises at 10.30 led by an instructor.

Stoneyford Fit Club – each Wednesday night at 8.15 in the Community Centre. Join the group for a lively exercise session suitable for everybody and held in a fun environment.

Johnswell Group – this group meets every Friday at 6pm in Johnswell Hall for an exercise session with an instructor that will set you up for the weekend. All are welcome – just turn up and enjoy.

Fr McGrath Centre – new group meeting at the walking track at the centre. The aim is to go from couch to 30 minutes of walking and learn how to use the Outdoor Gym there. All ages and levels of activity welcome. Challenge yourself!

Danesfort Community Centre – Each Friday night at 7.30 a ladies group meet for a gentle exercise session with qualified instructor. All welcome.

Castlecomer Community Hall – This is a new set of class starting on Wednesday mornings at 10am. Gentle exercises aimed at the over 50's in the area. All welcome.

Go For Life Games – Come and join the group in the Watershed every Tuesday night at 8.30pm for the gentle games of scidil, lobbers, flisc and also for short mat bowls. Men and women of any fitness levels welcome.

Team up with a friend or relative and get along to one of these sessions now. Some are free and some have a small charge. All take place in a social, fun environment with leaders. You can get more information or chat about any element of these projects with Seamus on 086 1057428 or email seanug64@yahoo.ie

Week 5

Excuses . . . and how to overcome them!

Seamus Nugent, Research Masters Student, Department of Health, Sport & Exercise Science, Waterford Institute of Technology.

I don't have the time.

Make being active a priority and make time for each day. Seize every little chance you can to be active, even if it's just for a few minutes. Do exercises while waiting for the kettle to boil. Get up and move around during TV viewing, especially those ad breaks!

I feel too tired

It can be a vicious circle. If you're not active, of course you will feel tired because you have no energy. If you get started you will have more energy and thus will feel less tired.

I have health problems, exercise might make it worse.

Most health problems can be helped by activity. Talk to your GP or healthcare professional without delay. They will be able to write an 'activity prescription'.

I'm afraid of getting injured

Start easy and gradually build up. If you walk or swim it is unlikely that you will get injured.

I can't afford it.

Look at the list of activities in this project – most are free or have just a small charge. Step outside your front door and walk a couple of times per week. Keep doing this until you can walk for 30 minutes – it won't cost you anything!

I'm too old.

You're never too old – there is always something you can do. The time to start is **NOW!**

There is nothing to do where I live – I don't have transport.

Have a look at all the programmes connected with this research project. There is something near you. Phase I of this research found that over 70% of those over 50 years own, or have access to, a car.

The weather is always bad during winter in Ireland.

If you are not active then the weather will always be bad because you use it as an excuse. The weather is not always bad. Every parish has a community hall – check out what activities happen there. The Watershed has a special offer for older adults on Mondays, Wednesdays and Fridays – why not come along?

I'm not the sporty type.

You don't have to play sport to be active. Try tidying up the garden, social dancing, walking, and aqua classes. If you can't swim, why not learn how to swim. Many people over 50 missed the opportunity to learn how to swim when they were younger. However, there are lots of opportunities to learn how to swim now. Use the contact details at the end of this article to find out more.

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• **Fit Club**	Stoneyford Community hall	Wednesday at 8.15pm. Variety of exercises suitable for all levels. All welcome. Small charge.
• **Circuits for over 50's**	Johnswell Hall	Friday at 6pm. Suitable for all and all welcome. Come and exercise and stretch yourself into the weekend.
• **Indoor exercises for all over 50's**	Castlecomer Community Hall	Wednesday mornings at 10am. Suitable for everybody.

Why not come along to any of these activities with a friend or relative? All of these activities are guided by qualified instructors in a welcoming, fun, safe environment. You can get more information or chat about any element of these projects with Seamus on 086 1057428 or email seanug64@yahoo.i

Week 6

The weather - an excuse for being inactive?

Seamus Nugent, Research Masters Student, Department of Health, Sport & Exercise Science, Waterford Institute of Technology.

In Ireland, one of the things we constantly discuss, and often complain about is the weather. The weather can often be an excuse or barrier for us when it comes to physical activity. If we are not regularly physically active it can be even more of an excuse. When we're not inclined to be active we can perceive the weather to be too hot, too cold, too wet, too windy – or any combination of these!

Recently Kilkenny Recreation & Sports Partnership organised a series of walks in Castlecomer. The walks, 6 in total, started at 10am each Wednesday. Of these, five mornings had cloudless, blue skies and bright sunshine. The other morning was slightly overcast. All of the walks went ahead and were enjoyed.

However, the weather is not always as perfect as that. But, there is always something you can do irrespective of the weather. We should try to have a variety of indoor and outdoor activities to do so that the weather can never be a spoil sport.

Currently, there are five projects up and running in the Kilkenny area, all of which aim to reduce the barriers to physical activity in older adults. (See the table below for details on how to get involved).

Plan ahead when you know if the weather is not going to be perfect. You could arrange to meet friends and go bowling. Pay a visit to the gym and get advice on how to use the equipment (see the table below). Why not invite a friend to your house and workout indoors to an exercise video or one of the many available online? You will have fun exercising and then chatting over a cuppa afterwards.

Visit the swimming pool with a friend and maybe arrange to get some lessons. It is never too late to learn to swim. Attend one of the many aqua sessions held in a variety of venues in Kilkenny. Many are aimed at over 50's – you'll make friends and get to chat. See contact number at the end of this article for information on any of these.

More often than not, exercising is just a matter of wearing the clothes appropriate for the weather conditions, opening the front door and getting out there for a brisk 30 minute walk. You will feel all the better for it.

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• **Indoor exercises for all over 50's**	Castlecomer Community Hall	Wednesday mornings at 10am. Suitable for everybody.

These groups are open to all. Most are free. Contact 086-1047428 for more details or email seanug64@yahoo.ie.

Week 7

Phone a friend and Get Active NOW!

Seamus Nugent, Research Masters Student, Department of Health, Sport & Exercise Science, Waterford Institute of Technology.

This research project looks at things that help older adults to be more active (facilitators) and also the things that prevent older adults from being active (barriers). Results from Phase I of the study showed that older adults believe that having a friend to be active with would help them be more active. Also, having a spouse / partner or family member who is active might mean that they are more likely to be active too. So, from today onwards why not:

- Exercise with a friend or family member. Do not wait to be asked, go ahead and take the initiative and invite somebody to go for a walk. It might just be what they need.
- Join a local walking group from the list on the table published with this article. They're up and running now and people are meeting, chatting and walking together.
- Take up a team sport – come along to the Go for Life games organised by Kilkenny Recreation and Sports Partnership every Tuesday night at 8.30 in the Watershed. There is even an intercounty game and fun day of activities with a group from Waterford planned for December 3rd. Physical activity doesn't have to be a solitary pursuit.
- Think back to physical activities you enjoyed when you were younger. Did you cycle to work? Why not come along to the discounted gym sessions that feature indoor cycling?
- Remember physical activity should be fun and does not have to be painful or boring in order for you to benefit from it. It's just about moving your body around more and doing it more often. As mentioned in previous articles you should be doing this preferably 5 times a week for 30 minutes each time!
- The numbers of older adults purchasing home exercise equipment is very low. And, if you do prefer to exercise alone, you should consider the option of using home exercise equipment such as a stationary bike, dumbbells or treadmill. By doing this so you can work out while watching your favourite television programs!

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These groups are open to all. Most are free. Contact 086-1047428 for more details or email seanug64@yahoo.ie.

Week 8

Consistency is the key - Get Active NOW!

Seamus Nugent, Research Masters Student, Department of Health, Sport & Exercise Science, Waterford Institute of Technology.

Any successful manager, athlete or team member will tell you that consistency is the key to success. Similarly with physical activity – it is never about going out and doing 4 hours activity one day per week. Instead, it is about getting out for 30 minutes on 5 or more days per week. We can even accumulate our 30 minutes activity in 10 minute bouts of activity. Great athletes and great teams work hard day in and day out for success. Many train straight through Christmas, including Christmas Day! While I do not advocate that older adults do this, we do need to be conscious that at Christmas time as much as any other time during the year we need to be regularly active.

We need to be active not just because of the likely increased calorie consumption that this time of the year brings but because our bodies are built to move 365 days of the year, every year.

From my time working with older adult groups, I have found that, generally, most people take a relaxed attitude to being active. With Christmas almost upon us, many groups and individuals shut up shop for the festive period and rest until the New Year. There's the office party, the choir party, the parish party, the active retirement party and a host of family feasts to attend and cater for between now and January.

As a result most groups stop meeting in early December to accommodate the party season. They do not reconvene until mid-January. As a result many older adults miss out on what little physical activity they might be getting for up to 6 weeks. This, coupled with the thousands of calories consumed during party time means getting active again can be very tough. The good habits formed during the rest of the year can be easily forgotten.

There is no reason why you should stop completely, just because the organised group you are a member of takes a break. This Christmas make sure you are going to maintain good physical activity levels. Try to be active every single day. Arrange to meet a friend or group of friends. Make a commitment to walk, cycle or swim every day. If the weather is bad, meet indoors and do some exercise together, find out the opening times of a local gym or pool and make sure you get there. When grandchildren visit why not go for a walk with them?

A consistent routine of physical activity takes time to develop. Once you have built up the habit and physical activity becomes part of your daily routine - why should you stop at Christmas?

• **Walking – couch to 3k – suitable for all levels** • **Outdoor Gym** **Learn to use equipment. Suitable for all participants**	**Fr McGrath Centre Walking Track**	**Wednesday morning 11am – walk and introduction to use of outdoor gym**
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• **Indoor exercises for all over 50's**	Castlecomer Community Hall	Wednesday mornings at 10am. Suitable for everybody.
• **Go for Life Games. Modified games for over 50's**	Watershed Sportshall	Each Tuesday night at 8.30pm until 9.30. All welcome. Small charge. Scidil, Lobbers and Flisc. Short matt bowls.

These groups are open to all. Some are free. Contact 086-1047428 for more details or email seanug64@yahoo.ie.

Week 9

Some pre-Christmas reading - Get Active NOW!

Seamus Nugent, Research Masters Student, Department of Health, Sport & Exercise Science, Waterford Institute of Technology.

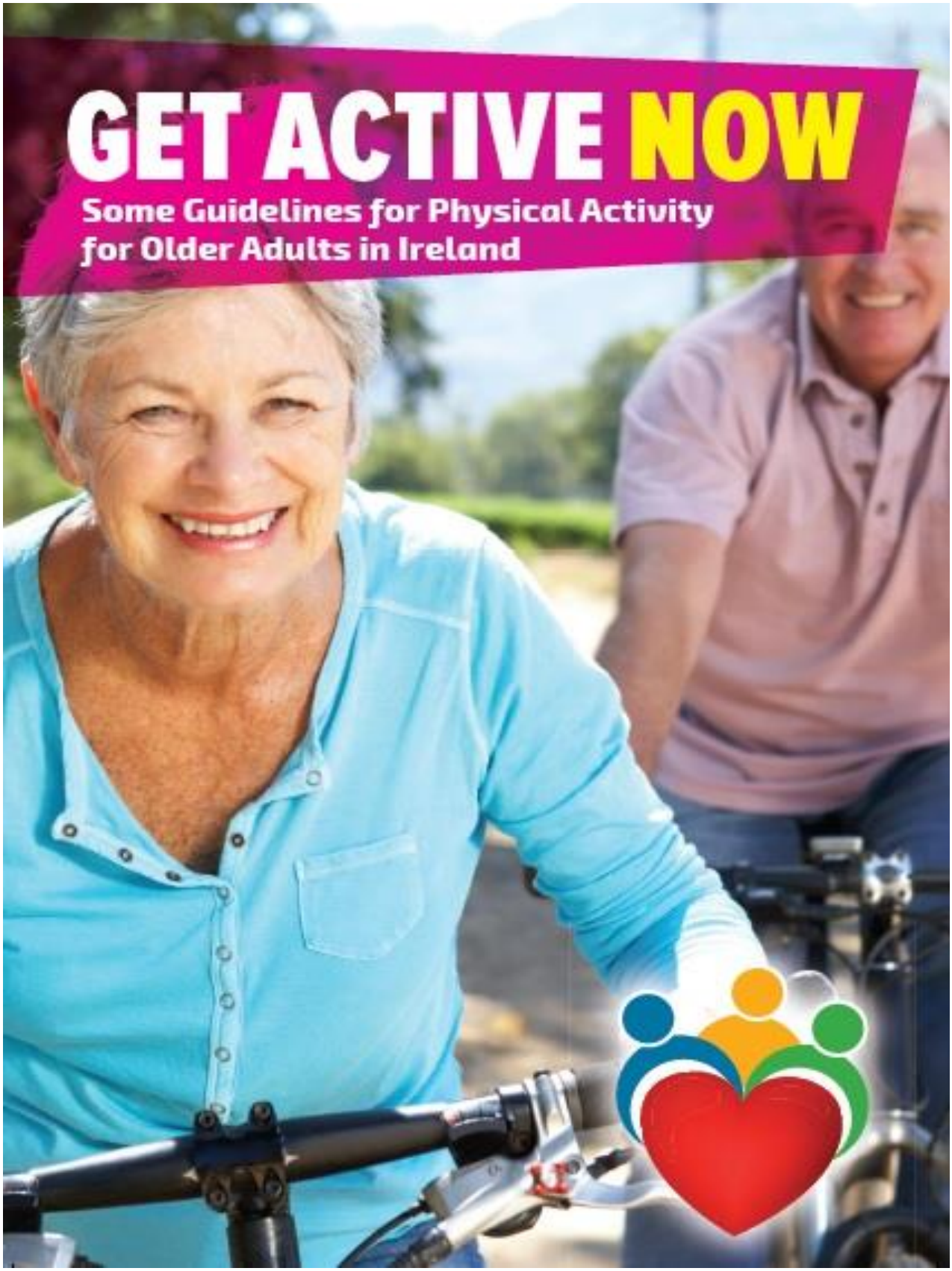
This week I want to bring your attention to a booklet (Get Active NOW!) which has just been published. The booklet highlights some guidelines for physical activity for over 50's in Kilkenny.

It covers some of the topics on which I have written about in this column during the past 7 weeks. Topics covered in the booklet are: Why be active? How to begin? What are the guidelines for physical activity? Top 10 tips for becoming active. There is also a comprehensive list of the groups and agencies that can assist you.

The booklet will be distributed through active retirement groups, pharmacies, GP's surgeries, active retirement groups and also through the network of settings that participated in the physical activity classes associated with my research.

To date the feedback about the articles has been brilliant. This time, I would like some feedback about the overall programme. I would like to know if you took part in the programme of activities. Did you enjoy them? If you didn't – what could be done to change them? I would also like to know if you would like them to continue after Christmas. There are already plans to continue some of them.

I would also like to know if you read the articles in the newspaper. What did you think of them? Did they encourage you to be active? Were they informative? Finally, I would love if you could read the booklet. Please make contact with me with your comments about it. Contact 086-1047428 or email seanug64@yahoo.ie.



Get Active NOW! - has just been published. It highlights tips for over 50's on how to become more active and groups, persons and agencies in Kilkenny that can help you.


Many older adults in Ireland are not sufficiently active -
Only 37% of those aged 60-64 meet the recommended physical activity guidelines.
By the age of 75 years only 18% of older adults are sufficiently active.
Do these groups include YOU?
The effects of inactive lifestyles are serious and are associated with poor quality of life, disease, disability and poor mental health. But all of this can be changed . . . by YOU!
There is overwhelming evidence that meeting the recommended guidelines for physical activity can have a beneficial effect on up to 20 chronic diseases or disorders.
2


Why should I do physical activity?
It will help you age better. We are living longer and, by being more physically active you can enhance the quality of those added years.
Being active helps us retain our independence – it is important to be able to do things in life that enable us to live on our own, in a healthy state for a long time
It keeps your heart healthy. In Ireland we have a high level of heart disease. Approximately 10,000 people die each year from cardiovascular disease.
It can help reduce falls which can have serious consequences for older adults.
Being physically active helps make you feel happier and can help to keep your brain sharp too.
Most important. It is a great way of meeting other people and sharing company, conversation and laughter.
3

How do I begin?

1. Set realistic goals – you're more likely to meet them. And, remember doing anything is better than doing nothing.
2. Begin with light intensity activities in bouts of 10 minutes. It should be comfortable but yet, a little bit challenging.
3. Pick something that is fun, something that your friends are doing?
4. Remember if you have not been active for a while it is best to have a chat with your GP before increasing your physical activity levels.

What are the guidelines?

1. The World Health Organization (WHO) recommends 150 minutes of moderate intensity **aerobic activity** per week. Moderate intensity raises your heart rate noticeably and gets you slightly out of breath.
   However, this might seem difficult and if you have not been doing much exercise for some time. But you can start slowly with bouts of 10 minutes at a time and gradually build up.
   Aerobic activity is exercise which uses large muscles groups and can be maintained over a period of time. It means that YOU should be doing things such as walking, cycling, dancing, swimming, aqua aerobics, jogging. It can also include involvement in games and sports with children and walking pets.
2. You also need to be doing **muscle strengthening exercises**. Men AND women lose muscle mass and strength as part of the ageing process. Strength and muscle power are important throughout life as they help you to perform activities of daily living such as getting out of a chair, climbing a stairs and carrying groceries. Your muscles need to work to lift weights such as barbells, resistance bands, and kettlebells. Begin with light weights and gradually build up so that you can lift these 12-15 times.
   You can also do muscle strengthening exercises using bodyweight - such as sit ups, push ups. They can be modified to make it easier for you to do them. Begin gently and build up.
3. **Balance exercises and flexibility.** Practice standing on one foot, then change sides; walk heel to toe; do side leg raises. Also, Tai Chi and Yoga are good activities for helping with balance, flexibility and strength.

Tip – Think about the amount of effort you are using to do the activity on a scale of 0 to 10, with 0 representing lying down at rest and 10 representing an effort that can't be sustained. **When your effort is 5 on the scale, you are at a moderate intensity.**

Top 10 tips for becoming active

1. Physical activity can be done in **bouts of ten minutes.** Start easy and build slowly.
2. Try to **leave the car at home** or park a little further from your destination. Try to walk at least some of the way to work or leisure.
3. **Decrease the amount of time you sit!** Use every opportunity to get up, move around especially during television viewing.
4. **Use the stairs** instead of lifts at shopping centres, hotels and work.
5. Be inspired by others. They may once have been inactive. **If they can do it, then so too can you.**
6. Get active **with a community group** that will get you out and about meeting other people who are physically active, (Meals on Wheels, Tidy Towns, community / cemetery clean up group).
7. **Take a walk with friends** rather than sitting for a chat. See the programme of events on this leaflet. Arrange to do something with friends.
8. **Challenge yourself (and a friend!) to do something new** that will increase your physical activity. Many clubs, gyms and groups offer taster sessions, introductory lessons, free sessions. Check out the numbers on this leaflet. It's a great way to meet people and have fun.
9. Remember doing **ANYTHING is better than doing NOTHING.**
10. It is **NEVER TOO LATE TO START!**

Who can help me?

Kilkenny Recreation and Sports Partnership – run many older adult programmes. There is something for you. Telephone: 056-7794990

Cycling groups – there are opportunities to get back cycling (See Kilkenny Peddlers on Facebook)

Lacken Pitch & Putt. Why not go with a group and have some fun. Contact: Ger Grace, Dublin Rd, Kilkenny. Telephone: 086 8661105

Go for Life games – bowls and modified games are great fun. These take place at the Watershed from October to December and from January to April. Contact **Kilkenny Recreation & Sports Partnership on 056-7794990 or Seamus on 086-1057428**

Gym – find out when other older adults attend and give it a try with an instructor to help you. The Watershed currently has a special programme for older adults on Mondays, Wednesdays and Fridays from 11am to 1pm. Telephone 056-7734620.

The local swimming pool and leisure centres provide water based activities for older adults.

The Watershed 056-7734620,
Ormonde Hotel 056-7723927
Newpark Hotel 056 7760500
Springhill Hotel 056 7721122

Kilkenny Age Friendly County – aims to make Kilkenny a great place to grow old were older people are valued for their wisdom, experience and contributions to an inclusive society and community. The promotion of physical activity is a key item on the agenda.
http://kilkennyagefriendlycounty.ie/

Social Dancing Groups – many groups have afternoon tea dances. See local newspapers for details.

ACTIVITIES FOR OVER 50's

Circuits / Pilates	Friday	8/1/16	Phone 086 105 7428	Danesfort Community Centre
Gym Introduction (walking, cycling, weights	Monday, Wednesday, Fridays 11am -1pm	4/1/16	€9 per week	Watershed, Kilkenny
Fit Club for over 50's (circuits, flexibility and balance	Wednesday 8.15pm	13/1/16	Phone 086 105 7428	Stoneyford Community Centre
Circuits and pilates for over 50's	Fridays 6pm	8/1/16	Phone 086 105 7428	Johnswell parish hall
Indoor exercises for over 50's	Wednesdays 10am	6/1/16	Phone 086 105 7428	Castlecomer Community Hall
Go for Life Games	Tuesdays 8.30pm	12/1/16	Phone 086 105 7428	Watershed, Kilkenny
Chair Based Exercise	Monday	18/01/16	TBC	Droichead Centre Callan
Pilates	Monday	18/01/16	TBC	Droichead Centre Callan
Walking Fitness Program with Walk Leader	Monday	18/01/16	€20	Canal Square
Walking Fitness Program with Walk Leader	TBC	18/01/16	€20	Piltown (TBC)
Over 50's Aqua Aerobics	Tuesday	19/01/16	€37.50	Ormonde Hotel
Over 50's Aqua Aerobics	Tuesday	19/01/16	€37.50	Newpark Hotel
Walking Fitness Program with Walk Leader	Tuesday	19/01/16	€20	Castlecomer Discovery Park
Swimming – Introductory Class	Wednesday	20/01/16	€45	Ormonde Hotel
Over 50's Aqua Aerobics	Thursday	14/01/16	€37.50	Ormonde Hotel
Pilates – Intermediate Class	Thursday	14/01/16	€45	The Watershed
Pilates – Beginners Class	Thursday	14/01/16	€45	The Watershed
Pilates – Advanced Class	Thursday	14/01/16	€45	The Watershed
Swimming – Improvers	Friday	22/01/16	€45	Ormonde Hotel
Swimming – Introductory	Friday	22/01/16	€45	Springhill Court

IMPORTANT:

This advice leaflet has been prepared by **Seamus Nugent,** a Research Masters student at Waterford Institute of Technology.

I would really appreciate your feedback. To do this you can email, telephone or text me and I will call you for a very brief chat.

Thanks in advance for this!

Telephone 086 1057428.
Email seanug64@yahoo.ie

8

Appendix H

Research Planning Costs

Research Planning Costs (Approximate)	**Time (Hours)**
Idea development / Ethical approval	40
Post Graduate 1 application (PG1)	80
Meetings with Supervisors (10) x 3 people	30
Meeting / set up Time with Community Centres (2 centres)	4
Meeting / set up Time with Fitness Facility	2
Meeting / set up Time with Rural Settings (2 settings)	4
Meeting / set up Time with Radio	2
Meeting / set up Time with Newspaper Editors	2
Delivery of Exercise Programme Sessions (57)	57
Writing of 8 Radio infomercials (unused)	4
Writing of 9 newspaper articles	9
Booklet research, design and production	6
Posters (2) design and distribution	4
Booklet distribution	8
Compilation of Phase I Questionnaire (1)	6
Distribution/Collection of Phase I Questionnaire	20
Compilation of Phase II Questionnaires (2)	12
Distribution/Collection of Phase I Questionnaire	40
Compilation of Letters of Introduction	3
Compilation of Letters of Consent	3
Printing of Questionnaires / Consent / Introduction	8
Delivery Time (Community Centre 1 Walk 6 sessions)	8
Attendance (Community Centre 2 – Walk 2 sessions)	3
Delivery Time (Rural Setting 2 – 8 sessions	16

Leaflet / Poster Distribution (Community Centre 1)	2
Leaflet / Leaflet Poster Distribution (Rural Setting 1)	2
TOTAL	**357 HOURS x minimum wage of €9.15 = €3,266.55**

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Appendix J – PHASE I Questionnaire

CODE:

A. Background Information

1. Address /location: Town ❑ OR Rural (Outside town) ❑ 2. Age: ……..

3. Gender: Male ❑ Female ❑ 4. I have access to a car / transport Yes ❑ No ❑

5. Which of the following best describes your current status **(tick one box only):**

Retired ❑ Semi-retired ❑ Caring for grandchildren ❑ Volunteering ❑

Employed full-time ❑ Employed part-time ❑ Other ❑

B. Physical Activity

6. According to current recommendations, what is the minimum amount of moderate to vigorous intensity physical activity that adults should perform to gain health benefits?

Please give your answer in minutes per day **OR** minutes per week **(PLEASE TICK ONE BOX ONLY)**

Minutes per day: ☐ **OR** Minutes per week: ☐

7. How would you rate your level of physical activity compared to other people the same age and gender as yourself? **(PLEASE TICK ONE BOX ONLY)**

❑ Much less than others ❑ Somewhat less than others

❑ About the same ❑ Somewhat more than others ❑ Much more than others

8. In the past week, on how many days have you done a total of 30 minutes or more of physical activity, which was enough to raise your breathing rate? This may include sport, exercise, brisk walking or cycling for recreation or to get to and from places. It should not include housework or physical activity that may be part of your job. **(PLEASE TICK ONE BOX ONLY)**

0 days ❑ 1day ❑ 2 days❑ 3 days ❑

4 days ❑ 5 days ❑ 6 days ❑ 7 days ❑

9. In a typical week, on how many days would you accumulate 30 minutes or more of physical activity, which was enough to raise your breathing rate? This may include sport, exercise, brisk walking or cycling for recreation or to get to and from places. It should not include housework or physical activity that may be part of your job. **(SEE OVER AND PLEASE TICK ONE BOX ONLY)**

0 days ❑ 1day ❑ 2 days❑ 3 days ❑

4 days ❑ 5 days ❑ 6 days ❑ 7 days ❑

10. During the LAST 7 DAYS, on how many days did you do exercises that may strengthen your muscles, such as push ups, sit ups, weight lifting or heavy lifting? **(PLEASE TICK ONE BOX ONLY)**

0 days ❑ 1day ❑ 2 days ❑ 3 days ❑

4 days ❑ 5 days ❑ 6 days ❑ 7 days ❑

11. How do you usually gain access to the following activities? **(PLEASE TICK ONE BOX PER ACTIVITY)**

	Walk	Cycle	Car	Lift with a friend or family member	Public Transport
Shopping	❑	❑	❑	❑	❑
Visit family / friends	❑	❑	❑	❑	❑
Travel to leisure time activity	❑	❑	❑	❑	❑

12. Are you a member of any group / club / organisation such as a sports club, community group, active retirement group, workplace social group, gym, walking club) that includes physical activity (exercise or sport) as part of their activities? Yes ❑ No ❑

13. If you answered YES to the last question, please state **(PRINT CLEARLY)**

WHAT IS THE NAME OF THE GROUP? _____

SPECIFY EXACTLY WHAT TYPE OF PHYSICAL ACTIVITY IS ON OFFER?_____

14. Have you invested in home exercise equipment such as treadmill, exercise bike, stepper, weights, bands, instructional videos in the last 3 months? Yes ❑ No ❑

C. Intention to change / importance of physical activity

15. I am currently physically active Yes ❑ No ❑

16. I intend to become more physically active in the next six months Yes ❑ No ❑

17. I have tried to be physically active but it did not work out for me Yes ❑ No ❑

18. I have been regularly physically active for the past six months Yes ❑ No ❑

19. In comparison to other things in life, how important to you is being physically active?

Extremely important ❑ Important ❑ Not important at all ❑ No opinion ❑

D. Environment / Neighbourhood

20. My neighbourhood has plenty of safe footpaths

Strongly Agree ❑ Agree ❑ Disagree ❑ Strongly Disagree ❑ Don't Know ❑

21. I do not have access to public parks for walking

Strongly Agree ❑ Agree ❑ Disagree ❑ Strongly Disagree ❑ Don't Know ❑

22. There is no gym or indoor fitness facilities near me`

Strongly Agree ❑ Agree ❑ Disagree ❑ Strongly Disagree ❑ Don't Know ❑

23. There is a gym or indoor fitness facility near me but I would not join it

Strongly Agree ❑ Agree ❑ Disagree ❑ Strongly Disagree ❑ Don't Know ❑

24. It is not safe for pedestrians to walk on or cross the roads in my area

Strongly Agree ❑ Agree ❑ Disagree ❑ Strongly Disagree ❑ Don't Know ❑

25. There are cycling facilities in my locality

Strongly Agree ❑ Agree ❑ Disagree ❑ Strongly Disagree ❑ Don't Know ❑

26. My area is not safe / too much traffic and this prevents me from being physically active

Strongly Agree ❑ Agree ❑ Disagree ❑ Strongly Disagree ❑ Don't Know ❑

E. Help to increase physical activity

27. Which of the following might encourage you to become more physically active?

Organised walking group in the area for all in the community	Yes ❑	No ❑
Gym membership which takes my needs and interests into consideration	Yes ❑	No ❑
Physical activity led by an instructor in a fun, social setting	Yes ❑	No ❑
Having a friend to be active with	Yes ❑	No ❑
Suitable facilities near me	Yes ❑	No ❑
Sporting activities suitable for my age	Yes ❑	No ❑
Sporting activities mixed with other ages but at an appropriate level	Yes ❑	No ❑
Safe walking paths	Yes ❑	No ❑
A park	Yes ❑	No ❑
An outdoor gym	Yes ❑	No ❑

F. Attitudes

28. I feel motivated to do physical activity	Yes ❑	No ❑
29. I do not feel confident when doing physical activity	Yes ❑	No ❑
30. I do not seem to have the skills to keep going in physical activity sessions	Yes ❑	No ❑
31. I think physical activity will change my life for the better	Yes ❑	No ❑
32. I always work around obstacles to physical activity; Nothing really stops me	Yes ❑	No ❑
33. I would be prepared to give up my leisure time things for physical activity	Yes ❑	No ❑

G. Personal factors for NOT being physically active (SKIP IF ACTIVE)

34. Poor Health	Agree ❑	Disagree ❑
35. Recent injury, illness, operation or medical reason	Agree ❑	Disagree ❑
36. My friends are not active	Agree ❑	Disagree ❑
37. My partner / spouse is not active	Agree ❑	Disagree ❑
38. I have a disability	Agree ❑	Disagree ❑
39. Physical activity is too expensive	Agree ❑	Disagree ❑
40. I have no time due to work / family commitments	Agree ❑	Disagree ❑

A Focus Group discussion will be held to further explore the topics in this survey. If selected, I would be willing to take part in the Focus Group discussion (1 hour with light refreshments).Yes ❑ No ❑

If **'Yes'** please clearly PRINT your Name, Address and contact telephone number (you will only be contacted in conjunction with this project: …… .....

.....

Based on the results of this survey, several physical activity interventions are planned. Please state if you would like to take part in one of these. Yes ❑ No ❑

If **'Yes'** please clearly PRINT your Name, Address and contact telephone number (you will only be contacted in conjunction with this project: …… .....

.....

Thanks - you are now finished this survey. *Seamus Nugent (*Waterford Institute of Technology)

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Appendix K

PRE INTERVENTION QUESTIONNAIRE

CODE:

A. Background Information

1. Name: **(PLEASE PRINT CLEARLY)**

…… **2.** Age: …….

3. Address /location: Town ❑ OR Rural (Outside town) ❑ **4.** Gender: Male ❑ Female ❑

B. Physical Activity

5. How would you rate your level of physical activity compared to other people the same age and gender as yourself? **(PLEASE TICK ONE BOX ONLY)**

❑ Much less than others ❑ Somewhat less than others

❑ About the same ❑ Somewhat more than others ❑ Much more than others

6. In the **PAST WEEK,** on how many days have you done a total of 30 minutes or more of physical activity, which was enough to raise your breathing rate? This may include sport, exercise, brisk walking or cycling for recreation or to get to and from places. It should not include housework or physical activity that may be part of your job. **(PLEASE TICK ONE BOX ONLY)**

0 days ❑ 1day ❑ 2 days❑ 3 days ❑

4 days ❑ 5 days ❑ 6 days ❑ 7 days ❑

7. In a **TYPICAL WEEK,** on how many days would you accumulate 30 minutes or more of physical activity, which was enough to raise your breathing rate? This may include sport, exercise, brisk walking or cycling for recreation or to get to and from places. It should not include housework or physical activity that may be part of your job. **(SEE OVER AND PLEASE TICK ONE BOX ONLY)**

0 days ❑ 1day ❑ 2 days❑ 3 days ❑

4 days ❑ 5 days ❑ 6 days ❑ 7 days ❑

8. In the **PAST WEEK,** how often did you undertake muscle strengthening activities involving the major muscle groups of the body? **(PLEASE TICK ONE BOX ONLY)**

0 days ❑ 1day ❑ 2 days ❑ 3 days ❑

4 days ❑ 5 days ❑ 6 days ❑ 7 days ❑ ➔

9. What type of activities do you take part in? **(Tick all that apply)**

Walking ❑ Weights ❑ Circuits ❑ Bowls, boccia, skittles ❑ Swimming ❑

❑Dancing Golf ❑ Pilates ❑ Yoga ❑ Aqua aerobics ❑ Chair based activities ❑

❑Tennis ❑ Cycling ❑ Running ❑ Badminton ❑ **NONE** ❑

Other:……

10. Where do you usually take part in these activities?

At home ❑ Gym ❑ Community / Parish hall ❑ Local Park / Wood ❑ Club ❑

Studio ❑ Golf / Tennis Club ❑ Swimming Poor ❑ Rural road / footpath❑

C.

11. According to current recommendations, what is the minimum amount of moderate to vigorous intensity physical activity that older adults should perform to gain health benefits? Please give your answer in minutes per day **OR** minutes per week. (Please do **NOT** use both boxes)

Minutes per day ☐ **OR** Minutes per we ☐

Don't know: ❑

12. I have **RECENTLY** read or heard some information about the current nationally recommended physical activity guidelines for older adults Yes ❑ No ❑

If **'YES'** please indicate the source(s):

Local Radio advert ❑ Local Newspaper ❑ Booklet ❑ A friend ❑

A family member ❑ Through a group that I am a member of ❑ National newspaper ❑

Internet search: ❑ My doctor: ❑

Other:……

13. Do you recall any content or key messages from the booklets, radio adverts or newspaper articles?

I don't recall any content/key messages ❑

I do recall the following content/key message(s) ❑

Please detail (what the message was and where you heard it) if you can:

……

D.

14. Which of these statements best describes your view?

A. I take enough physical activity to keep healthy ❑

B. I don't take enough physical activity to keep healthy ❑

If you answered **A** above then please go to **section F**. If you answered **B** then please go to **section E**

E. Potential barriers for NOT being physically active

PLEASE RANK, IN ORDER OF IMPORTANCE, THE TOP THREE THINGS THAT PREVENT YOU FROM BEING MORE PHYSICALLY ACTIVE (1 BEING THE THING THAT MOST PREVENTS YOU FROM BEING ACTIVE, 2 BEING THE NEXT MOST IMPORTANT THING ETC.)

15. I have no confidence when doing physical activity ❑
16. My friends / partner / spouse are not active ❑
17. I have poor health / illness / disability ❑
18. Physical activity is too expensive ❑
19. I have no time due to work / family commitments / lack of interest ❑

F.

20. Consider the following statement please. My comment on this group activity.

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I came because my friends were coming too	**1**	**2**	**3**	**4**	**5**
I live close by – the location is convenient	**1**	**2**	**3**	**4**	**5**
The time of day of the activity suits me	**1**	**2**	**3**	**4**	**5**
The day(s) of the week suits me	**1**	**2**	**3**	**4**	**5**

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I can afford the cost / the activity is FREE	**1**	**2**	**3**	**4**	**5**
I want to be more physically active	**1**	**2**	**3**	**4**	**5**
The activities are suitable for people my age	**1**	**2**	**3**	**4**	**5**
The activities are suitable for my ability	**1**	**2**	**3**	**4**	**5**
I like the activities that are offered	**1**	**2**	**3**	**4**	**5**
I like the instructor	**1**	**2**	**3**	**4**	**5**
I like the venue	**1**	**2**	**3**	**4**	**5**
The weather was poor and this discouraged me from being active	**1**	**2**	**3**	**4**	**5**
Other reason: (please cite and rate)_____	**1**	**2**	**3**	**4**	**5**

21. If you were to attend a fitness class, which of the following would you be most likely to attend (**please tick only two**):

Specially adapted aerobics ❑ Gym (weights) ❑ Pilates ❑ Yoga ❑ Tai Chi ❑

Walking Group ❑ Indoor Cycling ❑ Aqua Aerobics ❑ Swimming classes ❑

Running Club ❑ None ❑

22. What do you hope to gain from this programme? (Carefully consider the following choices, and then, please rate your top 3 reasons, where 1 is the most important and so on). **PLEASE PRINT CLEARLY**

It might help me to become more motivated to be physically active ❑

It might be good fun ❑

I might make new friends ❑

It might give me more personal time from other commitments ❑

I might learn some new skills ❑

It might increase my confidence regarding physical activity ❑

I might gain some health benefits ❑

Other (please cite): 1._____ 2._____

23. How did you hear about this older adult physical activity programme?

Radio ❑ Newspaper ❑ Poster ❑ A friend ❑ A family member ❑

Through a group that I am a member of ❑Doctor ❑

We would like to contact you via text or email at the end of the programme to ask you two brief questions about your physical activity.

Do you give your consent to the researcher to contact you? Yes ❑ No ❑

If **'Yes'** please **PRINT (CLEARLY)** your Name and Contact Telephone and / or email here:

Name:……

Phone:……

Email:……

Thank you - you are now finished this survey. ***Seamus Nugent (*****Waterford Institute of Technology)**

Contact details - email: seanug64@yahoo.ie OR telephone 086-1057428

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Appendix L

CODE:

POST INTERVENTION QUESTIONNAIRE

A. Background Information

1. Name: **(PLEASE PRINT CLEARLY)**

…… **2.** Age: …….

3. Address /location: Town ❑ OR Rural (Outside town) ❑ **4.** Gender: Male ❑ Female ❑

B. Physical Activity

5. How would you rate your level of physical activity compared to other people the same age and gender as yourself? **(PLEASE TICK ONE BOX ONLY)**

❑ Much less than others ❑ Somewhat less than others

❑ About the same ❑ Somewhat more than others ❑ Much more than others

6. In the **PAST WEEK**, on how many days have you done a total of 30 minutes or more of physical activity, which was enough to raise your breathing rate? This may include sport, exercise, brisk walking or cycling for recreation or to get to and from places. It should not include housework or physical activity that may be part of your job. **(PLEASE TICK ONE BOX ONLY)**

0 days ❑ 1day ❑ 2 days ❑ 3 days ❑

4 days ❑ 5 days ❑ 6 days ❑ 7 days ❑

7. In a **TYPICAL WEEK**, on how many days would you accumulate 30 minutes or more of physical activity, which was enough to raise your breathing rate? This may include sport, exercise, brisk walking or cycling for recreation or to get to and from places. It should not include housework or physical activity that may be part of your job. **(SEE OVER AND PLEASE TICK ONE BOX ONLY)**

0 days ❑ 1day ❑ 2 days❑ 3 days ❑

4 days ❑ 5 days ❑ 6 days ❑ 7 days ❑

8. In the **PAST WEEK,** how often did you undertake muscle strengthening activities involving the major muscle groups of the body? **(PLEASE TICK ONE BOX ONLY)**

0 days ❑ 1day ❑ 2 days ❑ 3 days ❑

4 days ❑ 5 days ❑ 6 days ❑ 7 days ❑ ➔

9. As part of this programme to increase physical activity, which type of activity or activities did **YOU** take part in?

Walking Group ❑ Indoor Gym (Watershed) ❑ Indoor Cycling ❑ Outdoor Gym ❑ NONE ❑

Chair based activities ❑ Other (please cite)_____

10. Where did you do these activities?

Watershed Gym ❑ Clara Hall ❑ Clara GAA Club walking track ❑ Newpark Fen ❑

Newpark Close FRC ❑ Fr McGrath Centre walking track / outdoor gym❑

Danesfort Community Centre ❑ Other, apart from these (please cite) _____

C.

11. According to current recommendations, what is the minimum amount of moderate to vigorous intensity physical activity that older adults should perform to gain health benefits? Please give your answer in minutes per day **OR** minutes per week. (Do **NOT** use both boxes)

Minutes per day [ ] **OR** Minutes per week [ ]

Don't know: ❑

12. I have **RECENTLY** read or heard some information about the current nationally recommended physical activity guidelines for older adults Yes ❑ No ❑

If **'YES'** please indicate the source(s:

Local Radio advert ❑ Local Newspaper ❑ Booklet ❑ A friend ❑

A family member ❑ Through a group that I am a member of ❑ National newspaper ❑

Internet search: ❑ My doctor: ❑

Other:……

13. Do you recall any content or key messages from the booklets, radio adverts or newspaper articles?

I don't recall any content/key messages ❑

I do recall the following content/key message(s) ❑

Please detail (what the message was and where you heard it) if you can:

……..

D

14. Compared to the start of this programme I am now:

❑ Much more active ❑ Somewhat more active

❑ About the same ❑ Less active

15. Which of these statements best describes your view?

A. I take enough physical activity to keep healthy ❑

B. I don't take enough physical activity to keep healthy ❑

If you answered **A** above then please go to **section F**. If you answered **B** then please go to **section E**

E. Potential barriers for NOT being physically active

PLEASE RANK, IN ORDER OF IMPORTANCE, THE TOP THREE THINGS THAT PREVENT YOU FROM BEING MORE PHYSICALLY ACTIVE (1 BEING THE THING THAT MOST PREVENTS YOU FROM BEING ACTIVE, 2 BEING THE NEXT MOST IMPORTANT THING ETC.)

16. I have no confidence when doing physical activity ❑

17. My friends / partner / spouse are not active ❑

18. I have poor health / illness / disability ❑

19. Physical activity is too expensive ❑

20. I have no time due to work / family commitments / lack of interest ❑

F. Some questions about the programme

21. Consider the following statement please. My comment on this group activity.

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I came because my friends were coming too	**1**	**2**	**3**	**4**	**5**

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I live close by – the location is convenient	**1**	**2**	**3**	**4**	**5**
The time of day of the activity suited me	**1**	**2**	**3**	**4**	**5**
The day(s) of the week suited me	**1**	**2**	**3**	**4**	**5**
I could afford the cost / the activity is FREE	**1**	**2**	**3**	**4**	**5**
I wanted to be more physically active	**1**	**2**	**3**	**4**	**5**
The activities were suitable for people my age	**1**	**2**	**3**	**4**	**5**
The activities were suitable for my ability	**1**	**2**	**3**	**4**	**5**
I liked the activities that are offered	**1**	**2**	**3**	**4**	**5**
I liked the instructor	**1**	**2**	**3**	**4**	**5**
I liked the venue	**1**	**2**	**3**	**4**	**5**
Participation was not dependent on the weather	**1**	**2**	**3**	**4**	**5**
Other reason: (please cite and rate)_____	**1**	**2**	**3**	**4**	**5**

22. If you were to attend a fitness class, which of the following would you be most likely to attend (**please tick only two**):

Specially adapted aerobics ❑ Gym (weights) ❑ Pilates ❑ Yoga ❑ Tai Chi ❑

Walking Group ❑ Indoor Cycling ❑ Aqua Aerobics ❑ Swimming classes ❑

Running Club ❑ None ❑

23. What benefits, if any, did you get from this programme of activities? (Carefully consider the following choices, and then, please rate **your top 3 benefits**, where 1 is the most important). **PLEASE PRINT CLEARLY.**

I do not feel I benefitted from the programme ❑
(If you tick this please tell us why at the end of the questionnaire)

It helped me to become more motivated to be physically active ❑

It showed me that being physically active can be fun ❑

I made new friends ❑

It gave me more personal time from other commitments ❑

I learned some new skills ❑

It increased my confidence regarding physical activity ❑

I feel I gained some health benefits ❑

Other (please cite……

24. How did you hear about this older adult physical activity programme?

Radio ❑ Newspaper ❑ Poster ❑ A friend ❑ A family member ❑

Through a group that I am a member of ❑

We would like to do a very brief follow up survey with you via text or email 2 weeks after the programme has finished to ask you about your physical activity – this would really help us.

Do you give your consent to the researcher to contact you? Yes ❑ No ❑

If **'Yes'** please **PRINT (CLEARLY)** your Name and Contact Telephone and / or email here:

Name:……

Phone:……

Email:……

Thank you - you are now finished this survey. ***Seamus Nugent (*****Waterford Institute of Technology)**

Contact details - email: seanug64@yahoo.ie OR telephone 086-1057428

Appendix M

Walking Group for Over 50's

Join your friends - bring a friend for a fun, gentle stroll
Suitable for **ALL** levels of ability and fitness
- from complete beginners to very active

Suitable for **men** and **women**

Walking track at the Community centre

Every Wednesday morning at 11am

THIS ORGANISED WALK GROUP IS FREE!

Call Seamus

086-1057428

for more details

Appendix N

Institiúid Teicneolaíochta Phort Láirge Waterford Institute *of* Technology

Port Láirge, Éire.
T: +353-51-302000
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Waterford, Ireland.
T: +353-51-302000
www.wit.ie

25th February 2015

Mr Seamus Nugent
24 Hollybank Park
Clongowen
Waterford Road
Kilkenny

Dear Seamus,

Thank you for bringing your project 'Enabling quality, sustainable physical activity change in older adults – a study of barriers, facilitators and interventions' to the attention of the School of Health Sciences Research Ethics Committee.

I am pleased to inform you that we approve WIT's participation in the 1st phase of the project and we will convey this to Academic Council.

We wish you well in the work ahead.

Yours sincerely,

Dr Michael Harrison
Chairperson,
School of Health Sciences Research Ethics Committee