Masters thesis

The effects of an online, social group exercise programme on the mental, social, and physical health of older adults: a mixed methods review

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The effects of an online, social group exercise programme on the mental, social, and physical health of older adults: A mixed methods study

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A dissertation submitted in partial fulfilment of the requirements for the degree of Masters of Science by Research (MRes) from the Faculty of Science and Technology at Middlesex University - London

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Contents

Abstract 2

Definitions, Key Terms, and Abbreviations 4

Dissertation Overview 4

Section 1: History of Walk and Talk for Your Life 5

Section 2: Literature Review 6

- *Background* 6
- *Costs and Challenges of Prevention* 9
- *Lifestyle Interventions* 9
- *Online Lifestyle Interventions* 11
- *Trial Rationale* 11

Section 3: Evaluation of WTL-Z 12

- *Study 1 Methods and Design* 12
- *Study 1 Results* 15
- *Study 2 Methods and Designs* 20
- *Study 2 Results* 21
- *Study 3 Methods and Design* 28
- *Study 3 Results* 29

Section 4: Integration and Discussion of Findings 31

- *Feasibility and Acceptability of WTL-Z* 31
- *Demographics* 31
- *WTL-Z Evaluation* 33
- *Strengths and Limitations* 40
- *Conclusion and Recommendations* 40

Section 5: Growth and Business Plan 41

Resources 41

Appendices 52

Abstract

Background: COVID-19 has negatively impacted many aspects of the mental, social, and physical health of older adults in the United Kingdom. Exercise is a well-known treatment to improve aspects of mental and physical health and socialising is likely one strategy to help combat loneliness in older adults. Due to COVID-19 related social distancing restrictions innovative approaches are needed to support and empower older adults to exercise and socialise. A pilot trial of the online, social group exercise course entitled 'Walk and Talk for Your Life hosted via Zoom' (WTL-Z) demonstrated initial efficacy at reducing depression and loneliness.

Objective: Explore the mental, social, and physical effects of the 10-week WTL-Z course on older adults and determine what factors aid or limit the efficacy of the intervention.

WTL-Z Intervention: The WTL-Z 10-week course comprises 20 online sessions delivered via Zoom. Each session is composed of 15-minutes of informal socialising, 30-minutes of strength, balance, and cardiovascular exercises, followed by a 45-minute group discussion on a health topic.

Participants: This trial evaluated data from an initial sample of 276 older adults aged 50+ (average age 66.1 years) from London, United Kingdom (UK).

Method: This trial included three studies. Study 1 was a randomised control trail of the WTL-Z intervention, which included 2 groups (intervention, n=35; control, n=43). To explore in more detail the effects of WTL-Z, Study 2 adopts a qualitative method, through interviews with a subgroup of 20 participants who completed the WTL-Z intervention. Study 3 (n=18) was a non-controlled quantitative study of WTL-Z which provided members of the control group from Study 1 the opportunity to undergo the WTL-Z intervention.

Results: Composite score analysis evaluating aspects of mental, social, and physical health revealed a statistically significant difference between the intervention and control groups ($p=0.004$) with a medium to large effect size ($\eta 2 = 0.12$). Qualitative analysis identified seven potential factors to explain the health improvement of intervention group participants: 1) the therapeutic effects of exercise, 2) the benefits of routine and structure, 3) the positive outcomes associated with learning new skills, 4) feeling of increased social support, 5) a greater sense of belonging, 6) increased self-worth, and 7) developing a higher sense of agency in relation to their health. Lastly, Study 3 participants also improved aspects of their mental, social, and physical health confirming the quantitative results of Study 1.

Conclusion: The WTL-Z intervention is a feasible and acceptable intervention for older adults and preliminary evidence suggests the programme is effective to improve aspects of mental, social, and physical health in UK older adults.

The following is a list of definitions of key terms and abbreviations used throughout this dissertation. It is not an exhaustive list, rather it is intended to: clarify the definition of mixed-methods research, highlight key terms that are unique to this dissertation; and describe the most common abbreviations that may otherwise be confusing to the reader.

Definitions

Mixed-methods – an intellectual and practical synthesis based on qualitative and quantitative research (Johnson, Onwuegbuzie, and Turner, 2007).

Mixed-methods explanatory sequential design – this mixed-methods study design occurs in two distinct interactive phases. This design starts with the collection and analysis of quantitative data. This first phase is followed by the collection and analysis of qualitative data in order to explain or expand on the first-phase quantitative results. The subsequent qualitative phase of the study is designed so that it follows from the results of the quantitative phase (Creswell and Plano-Clark, 2011).

Key Terms

Older adults – this is a general term used throughout this document and refers to adults aged 50 years and older. This cut-off age, however, is not universally consistent throughout the literature. Therefore, when other cut-off ages are used to describe older adults, distinctions are made.

Study 1 – refers to the randomised control trial which took place between 25 January – 6 April 2021. Study 1 comprised a total of 78 participants, 43 of whom were members of the control group and 35 of whom underwent the intervention and completed the online Walk and Talk for Your Life 10-week course.

Study 2 – refers to the qualitative study, which was a follow-up explanatory sequential design variant.

Study 3 – refers to the non-controlled trial, which consisted of control group participants from Study 1.

Trial – the term trial refers to the collection of results from studies 1, 2, and 3. This term is used to alleviate confusion as this document will describe the findings of multiple studies. For example, this trial consisted of 3 studies, 1) a randomised controlled trial, 2) a qualitative follow-up study, and 3) a non-controlled trial.

Abbreviations

WTL – Refers to the original Canadian-based version of the Walk and Talk for Your Life programme, which began in 2014.

WTL-UK – Refers to the in-person, United Kingdom version of the Walk and Talk for Your Life programme, which began in 2019.

WTL-Z – Refers to the Zoom-based, United Kingdom version of the Walk and Talk for Your Life programme, which began in 2020

Dissertation Overview

This dissertation is divided into five sections. Section 1 covers the history of the Walk and Talk for Your Life programme followed by a literature review of similar lifestyle and online lifestyle interventions. Next, three studies were conducted to answer the research questions; the methods and results of which form Section 3. Section 4 integrates the three studies and discusses the key findings. Lastly, Section 5 expands on how Walk and Talk for Your Life plans to grow as a financially sustainable business to help combat the rise of chronic disease, loneliness, and improve mental health in UK older adults.

Section 1
History of Walk and Talk for Your Life

Between 2011 and 2012, nursing students from Mount Royal University (Calgary, Alberta) conducted more than 200 qualitative interviews with low-income older adults (aged 65-88 years) living in the community to determine their health goals and how best they could be supported. The resulting qualitative analysis revealed that feelings of loneliness was the most important health concern and participants wished they had more opportunities to socialise, exercise, and learn about health. Based on these findings, researchers at UBC, led by Dr. Charlotte Jones, created the 'Walk and Talk for Your Life' (WTL) intervention, a social group exercise and health education programme designed to alleviate loneliness and improve the physical function of older adults.

From 2012-2020, WTL sessions were held twice per week at a variety of community centres and residence halls throughout Kelowna, British Columbia and Calgary, Alberta. Each session began with 45 minutes of stretching, bodyweight strengthening, and balance exercises based on the Otago falls prevention programme (Robertson, Devlin, Gardner, & Campbell, 2001). This was followed by a 30-minute group walk. Participants, in groups of 20-40, then returned to their community centre or residence hall for a 60-minute health education session, which were led by several different community professionals and student volunteers. At the conclusion of the health education session participants were encouraged to engage in 20 minuntes of informal socialising and provide feedback and ideas for future health education topics (Akyurekli & Wilson, 2015). In 2018, a qualitative study was conducted with sixteen older adult participants who completed 12-weeks of WTL. Participants felt WTL helped motivate them to socialise and reduce feelings of loneliness by providing a sense of 'belonging' which appeared to be mediated by the group exercise/walking component of the course (Hwang et al., 2018).

In 2019, under the supervision of Dr. Anne Elliott at Middlesex University and in collaboration with Dr. Charlotte Jones at UBC, the researcher (N.B.), for his Master of Science (MSc) degree dissertation, adapted and implemented a 10-week version of the WTL course for older adults living in the United Kingdom (UK) (WTL-UK). WTL-UK followed a similar protocol to the one used in the Canadian WTL programme with the following adaptations: Firstly, as a certified personal trainer and nutritionist, the researcher (N.B.) led and guided each aspect of WTL-UK including the group walk. The class size of WTL-UK was smaller, between 6-8 participants, compared to the Canadian WTL programme (20-40 participants). Thirdly, due to the small class size, the health education portion of WTL-UK used a Socratic Method of teaching, compared to the Canadian WTL programme, which taught more didactically. The smaller class size also enabled the WTL-UK sessions to be shorter in length (2 hours) compared to the Canadian programme (2.5 hours), which resulted in a shorter interactive health education and less time allocated for informal socialising. WTL-UK also included a 5-minute group mindfulness meditation, which took place prior to participants exercising to ensure proper breathing technique. Additional equipment such as kettlebells, resistance bands, and medicine balls were included as part of WTL-UK, which were added to enhance and compliment the bodyweight exercises included within the Canadian programme. Lastly, WTL-UK health education sessions followed a structured 10-week curriculum, which revolved around the topics of stress, nutrition, movement, sleep, social connection, purpose in life, and behaviour change, based on books such as *The 4 Pillar Plan* by Dr. Rangan Chatterjee, *Atomic Habits* by James Clear and *Tiny Habits* by Dr. B.J. Fogg. This level of structure and emphasis on behaviour change differed from the interactive health education topics of the Canadian WTL programme, which were ongoing and led by volunteers and students with differing specialities and backgrounds.

As part of an unpublished MSc dissertation study at Middlesex University, Bender, Elliot, and Jones (2019), conducted a non-randomised controlled trial of their 10-week WTL-UK course in east London older adults (average age 66 years). Participants who completed the WTL-UK intervention (n=26) reduced their feelings of loneliness by 22% ($F=4.390$, $p=0.042$; $\eta 2=0.09$) compared with a 3% reduction in loneliness in the control group (n=22) who underwent "usual care" (i.e. referral to a local social prescribing link worker). Compared to baseline, WTL-UK intervention participants' symptoms of depression were alleviated by 33% ($p =.000$), self-efficacy improved by 9% ($p=.001$), and two functional fitness measures (i.e. gait speed and 30s Sit-to-Stand Test) each improved significantly. Following the conclusion of the WTL-UK study,

roughly half of intervention group participants expressed a desire to continue attending WTL-UK sessions and began paying £5 per session for once-weekly WTL-UK 'maintenance' classes. Therefore, WTL-UK transitioned from a study into a business, under the name 'Walk + Talk CIC' (community interest company). Follow-up assessments were completed with all WTL-UK intervention group participants, which revealed that the improvement in loneliness, measured by the 6-item de Jong Gierveld Scale (de Jong Gierveld & Van Tilburg, 2006), was maintained at 6 months and 1-year post-intervention.

In March 2020, due to the outbreak of COVID-19, WTL-UK began delivering classes online via the video conferencing platform Zoom and the group walk was removed from the protocol. Walk and Talk for Your Life -Zoom (WTL-Z) sessions were, therefore, shorter (90 minutes in total) and began with 20-minutes of informal socialising followed by a 5-minute guided group mindfulness meditation. Next, participants engaged in 30 minutes of stretching, strengthening, and balance exercises based on the Otago falls prevention programme, using household items such as tin cans and books as weights, with shadow boxing and marching in place included to supplement cardiovascular training. Following the exercise, participants took a short break before returning to their screens for a 35-minute health education discussion, based on the 10-week WTL-UK course curriculum.

In June 2020, as part of an unpublished MSc dissertation at St. Mary's University, Bender and Myrissa (2020) conducted a non-controlled pilot study (n=18) on the effectiveness of the WTL-Z 10-week course to reduce loneliness in London-based older adults. Participation in the study was free and following the conclusion of the 10-week virtual course, participants' feelings of loneliness were alleviated by 20%, measured by the 6-item de Jong Gierveld Loneliness Scale and depressive symptoms fell by 35%, as measured by the Geriatric Depression Scale-15 (Bender and Myrissa, 2020). Nearly half of the participants wished to continue their participation in WTL-Z weekly classes at the cost of £18.99 per month. WTL-Z, therefore, became an alternative revenue source for the WTL-UK business. This adaptation was vital as meeting in-person was not possible in London due to coronavirus social distancing related restrictions that were in place at the time.

While the findings of Bender and Myrissa (2020) were positive, a larger, more robust trial was needed to confirm the effects of WTL-Z to improve the mental, social, and physical health of London-based older adults. Therefore, in 2021, as part of a Masters of Science by Research (MRes) degree, the researcher conducted the following trial, outlined in Sections 2 – 4 of this document, in order to evaluate the effectiveness of the WTL-Z 10-week course in improving the mental, social, and physical health of London-based older adults.

Section 2
Literature Review

Background

The coronavirus pandemic 2019 (COVID-19) has negatively impacted the mental, social, and physical health of older adults in the UK. By June 2020, the prevalence of moderate to severe depression doubled (from 5% to 10%) in UK adults aged 70+ and 34% of adults aged 60+ agreed that their anxiety was worse or much worse than before the start of the pandemic (Office of National Statistics [ONS], 2020g). By April 2020, over a third (37.4%) of adults in Great Britain reported that the coronavirus (COVID-19) pandemic had affected their well-being and that levels of loneliness had increased by 44% (from 5% to 7.2%) following the outbreak of the pandemic (ONS, 2021).

Perhaps due to increased levels of anxiety and social distancing restrictions, lifestyle behaviours such as physical activity (PA) decreased significantly amongst all age groups following the outbreak of pandemic. For example, adults aged between 55 and 74 years reduced their PA level by 1.3% and those aged 75 years+ reported a 2.9% reduction compared to pre-pandemic levels (Sport England, 2021). Furthermore, one in five older adults (60 years and older) reported feeling less steady on their feet and 20% felt they could not walk as far as they could before the start of the pandemic (AgeUK, 2020).

Diet, another lifestyle behaviour, was also negatively affected due to the pandemic. For example, while fruit and vegetable (FV) consumption reportedly increased in UK adults following the outbreak of the pandemic, it coincided with a 15% increase in daily caloric intake, which remained higher than normal throughout 2020 (O'Connell, Smith, and Stroud, 2021). UK adults gained, on average, 4.1kg since March 2020 and those aged 35 and older were most affected with an average weight gain of 4.6kg (Public Health England [PHE], 2021).

Prior to the outbreak of COVID-19, mental, social, and poor physical health were some of the biggest challenges facing UK older adults and contributed to rising costs within the National Health Service (NHS). For example, in 2016, one-quarter of UK adults aged 65 and older were experiencing depression and/or anxiety and nearly eight in ten adults over the age of 55 believed they had suffered from depression or anxiety at some point over their lifetime (AgeUK, 2017). In 2007, depression and anxiety cost the health service in England £7.5 billion and £1.2 billion respectively (McCrone et al., 2008). In 2018, 47% of adults in England reported that they occasionally, sometimes, or often felt lonely and 1.5 million over-50s are "chronically lonely" (ONSc, 2018; Oakley and Rose, 2019). In adults aged 65 and over, McDavid, Bauer, and Park (2017) estimated that loneliness costs the NHS £1 billion per year, which is often due to lonely people seeking social contact by visiting their GP (Campaign to End Loneliness, 2018).

Nearly three-quarters of UK adults aged 45 and older are overweight or obese, 11.1% suffer from muscle weakness, up to one in three experience a fall each year, and 40% of adults aged 65 years or older suffer from at least one chronic condition (Pinedo-Villanueva, 2019; NHS Digital, 2021). In total, these physical health related conditions (£36.6 billion) and lifestyle behaviours such as diet related ill health (£5.8 billion) and physical inactivity (£0.9 billion) cost the NHS £43.3 billion annually. (Royal College of Physicians, 2008; Scarborough et al., 2011; Department of Health, 2012; Pinedo-Villanueva, 2019). Taken together depression, anxiety, loneliness, obesity, muscle weakness, falls, poor diet, physical inactivity, and chronic diseases cost the NHS £53 billion per year.

Mental, social, and physical health are inextricably linked and highly associated (Naylor et al., 2016). For example, nearly half (46%) of people with a mental health disorder have a long-term physical health condition and depression and obesity share a bi-directional association (Naylor et al., 2012). Loneliness, which is not considered a mental health disorder, but rather a part of social wellbeing, is responsible for 18% of depression among people over age 50 in England (Mushtaq et al., 2014; Domènech-Abella et al., 2019). Furthermore, lonely people are more likely to develop a long-term physical health condition, such as dementia, compared to non-lonely individuals (Jung and Luck-Sikorski, 2019; Lee et al., 2021). Fortunately, improving one health domain (mental, social, or physical health) can lead to improvements in another. For example, maintaining a healthy social life is of great importance in maintaining good mental health and interventions that reduce loneliness often also improve aspects of mental health such as depression (Grønning et al., 2018; Lee et al., 2021). Increasing PA levels, which can improve physical health is well-known to concurrently improve mental health disorders such as depression and anxiety (Netz, et al., 2005; Rebar et al., 2015). Other lifestyle behaviours, such as quality sleep, good diet, and stress management each can support an individual's mental and social health (Gee et al., 2019; Ljungber, Bondza, and Lethin, 2020; Creswell et al., 2012; Hofmann and Gómez, 2017).

A mechanistic explanation for the dynamic and integrated relationship observed between health domains may be the role that chronic inflammation can have on health and disease. For example, elevated levels of C-reactive protein (CRP), a biomarker of chronic inflammation, can contribute to the pathogenesis of depression and nearly every chronic disease, such as arthritis and type two diabetes (Danese et al., 2008; Crofts et al., 2015; Neresian et al., 2018; Leonard and Wegener, 2020). Elevated CRP is associated with loneliness and interventions that reduce loneliness may also reduce levels of chronic inflammation (Heffner et al., 2011; Creswell et al, 2012). Lifestyle behaviours such as physical activity, quality sleep, good diet, and stress management also can contribute to reductions in CRP and reduce the risks of developing depression and numerous other chronic diseases (Brinkley, and Nicklas, 2010; Irwin et al., 2015; Beavers, Brinkley, and Nicklas, 2010; Zheng et al., 2019; Tolkien, Bradburn, and Murgatroyd., 2019).

Attempting to reduce chronic inflammation with lifestyle, however, is not within the scope of the biomedical model, which continues to dominate the practice of medicine in most Western healthcare systems, including the NHS (Willis and Elmer 2007). The biomedical model views illness as a breakdown due to a biological reason within the body which is independent from the mind or other externalities (Ventegodt et al., 2004). Healthcare professionals, therefore, treat physical illness with the use of drugs, radiation, and surgery and mental health illness with psychopharmacological drugs. The use of these types of treatments can firstly, teach the patient that their healthcare professional is primarily responsible for their health and secondly, that their physical and mental health, as they are treated separately, are unrelated (Willis and Elmer, 2007). The biomedical model is built from the perception that health is the absence of illness and therefore, disease prevention is not prioritised (Willis and Elmer 2007). This understanding, however, contradicts the World Health Organisation's (WHO) (1948) definition, which recognised that health consisted of mental, social, and physical domains and was not merely the absence of disease.

This holistic perspective of health was enhanced by Manwell et. al. (2015), who proposed their Transdomain Model of Health. The Transdomain Model of Health was depicted graphically as three interlocking circles to represent physical, mental, and social health in order to provide a representation of how each domain interacts and affects each other holistically (Rocca and Anjum, 2020). A holistic view of mental health, one in which mental and physical health are understood as interdependent, rather than treated in isolation, was recommended by Gendle (2016) for use in behavioural health interventions. Fiandaca et al. (2017) suggested that a holistic approach to health care would improve patient outcomes especially in the treatment of chronic diseases, due to their complex pathophysiology. Lastly, Tremblay and Richard (2011) recommend health promotion interventions, or those efforts to encourage individuals, groups, and communities to take charge of the determinants of their own health, should adopt a holistic approach due to the comprehensiveness of health as a concept and the contextual dimensions that contribute to health problems.

While social well-being was included as one of several facets by WHO (1948) in their definition of health, social health is less intuitively familiar than that of mental or physical health (Chen, Hicks, and While, 2014). Russell (1973) defined social health as:

> *'That dimension of an individual's well-being that concerns how s/he gets along with other people, how other people react to her/him, and how s/he interacts with social institutions and social mores' (Russell, 1973, p. 75)*

This definition is broad as it incorporates elements of personality and social skills, reflects social norms, and bears a close relationship to concepts such as "well-being," "adjustment," and "social functioning." Similarly, Castel et al. (2008) described social health as perceived well-being regarding social activities and relationships, including the ability to relate to individuals, groups, communities, and society as a whole. As social isolation and loneliness can be a risk factor for illness and there is increasing evidence that those who are well integrated into their communities tend to live longer and recover faster from disease, including a social component of health is justified within the broader definition of health. (Jung and Luck-Sikorski, 2019; Lee et al., 2021). Unlike mental or physical health, however, a comprehensive quantitative measure of social health does not exist (Abachizadeh et al., 2014). Social health and loneliness, however, share similar themes, such as social relationships, social support, and interpersonal functioning. Loneliness is defined by Perlman and Peplau (1981) as:

> *'A subjective, unwelcome feeling of lack or loss of companionship. It happens when we have a mismatch between the quantity and quality of social relationships that we have, and those that we want' (Perlman and Peplau, 1981, p. 35).*

Loneliness is not about being alone, but a lack of desired meaningful connections (Hawkley and Cacioppo, 2010; Savikko et al., 2005). Weiss (1973) suggested that loneliness has social and emotional dimensions. Social loneliness refers to the absence of an acceptable social network that can provide a sense of belonging, acceptance, and community, whereas emotional loneliness refers to the absence of an intimate partner or friend(s) who someone can trust and rely on completely (Weiss, 1973). While subjective by nature, loneliness can be measured quantitatively via the 6-item de Jong Gierveld Loneliness scale, which includes

questions to evaluate both social and emotional loneliness as defined by Weiss (1973) (de Jong Gierveld & Van Tilburg, 2006). Therefore, loneliness, which is a well-established norm measured by robust quantitative instruments, is a justifiable alternative to evaluate aspects of a person's social health (Wang et al., 2018; Arpin, 2015).

In summary, limitations exist in the biomedical model of Western medicine and a more holistic perspective of health which treats disease with lifestyle is required to address the mental, social, and physical health challenges facing older adults in UK, many aspects of which have been exacerbated by the COVID-19 pandemic.

Costs and Challenges of Prevention
In its Five Year Forward View, published in 2016, the NHS outlined how it planned to empower patients and dedicated a section to 'getting serious about prevention'. In 2019, NHS England published their Long Term Plan, which continued to promote prevention as a way to reduce disease burden. Therefore, the NHS is aware of the limitations of the biomedical model and is likely why 5% of its budget is spent on preventive services (Plotkin, 2016). Preventative services, as defined by the Office of the Deputy Prime Minister (2006), includes those services that prevent/delay the need for more costly intensive services particularly those services that improve the quality of life of older adults. This is likely because over two-fifths of the NHS annual budget is spent on treating people over 65 (Nuffield Trust, 2012). These cost pressures are unlikely to abate as the population of adults aged 65+ is estimated to grow by 48.9% by 2035 (ONS, 2018).

The assumption that increased NHS-related spending on preventative service for older adults will result in cost savings, however, is overreaching. Russell (2007) concluded that preventing illness can save money in some cases, but in others it can add to health care costs. Given the bureaucratic nature and size of the NHS, increased expenditure does not simply equate to greater care for patients (Friedman, 1977). Therefore, decisions about how to invest limited public resources must consider the cost of delivering the service and demonstrate that the benefits that can be expected from an intervention (O'Connell, Boat, and Warner, 2009). A further challenge is that healthcare providers may not perceive a preventative service as worthwhile from its narrow perspective, whereas from a social perspective (e.g. economic benefits and improvement in life satisfaction) the intervention may be highly cost-effective. Therefore, aligning incentives and spreading the costs across service systems and budgets to those who benefit from preventative services is recommended, but would require coordinated planning (Curry, 2006). Cost-savings of prevention may also take years to emerge in health services – longer than an annual budget period and often longer than parliamentary terms. Political interests and public choice theory, therefore, must also be considered as healthy voters, for example, may be less willing to pay for preventative treatments that they would not personally benefit from or qualify to attend. Perhaps in part due to these costs and challenges, the NHS often partners with private and voluntary sector organisations to help deliver health services, including those aimed at prevention. One such example is the NHS Diabetes Prevention Programme (NHS-DPP), which is a preventative lifestyle intervention that began in 2015 as a partnership between the NHS, Public Health England, and the charitable organisation DiabetesUK.

Lifestyle Interventions
Lifestyle interventions are defined as any intervention that includes exercise, diet, and at least one other component (e.g., counseling, stress management, smoking cessation) (Sumamo et al., 2011). The NHS-DPP is a 9-month, 13-session, group-based lifestyle intervention designed to help participants change their lifestyle in order to lose weight and reduce their risk of developing type two diabetes. Participants who complete NHS-DPP on average lose 3.3kg of body weight and reduce their glycated haemoglobin (HbA_{1c}) by 2.04 mmol/mol (Valabhji et al., 2020). In an economic evaluation, Thomas et al. (2017), concluded that intervention costs associated with the NHS-DPP can be recouped within 12 years, with net NHS savings of £1.28 over 20 years for each £1 invested. Roberts (2018) also concluded the NHS-DPP is cost-effective even compared to other interventions such as the United States Diabetes Prevention Programme, metformin (a common diabetes medication), and no intervention.

The NHS-DPP, however, costs the NHS £270 per person per year to implement, as it is free to those participants who are pre-diabetic and are referred by their GP. A potentially more cost-effective model,

which utilises a type of co-payment system, is offered by the company Second Nature, a digital, weight management and diabetes prevention programme. Results from a study conducted by Second Nature revealed that participants who enrolled in their 3-month course lost an average of 7kg and experienced a 13.6 mmol/mol reduction in their glycated haemoglobin, far superior to the NHS-DPP results (Idris et al., 2020). Participants who are referred by their GP receive a discounted rate to Second Nature's 3-month programme and this discount is offset by the NHS. Unlike the NHS-DPP, Second Nature encourages self-referral and directly markets to consumers at a rate of £40-£60 per month. This type of co-payment system likely creates additional cost savings to the NHS as many participants who self-refer are pre-diabetic, but can otherwise afford the programme, and rather than making a GP appointment, simply register for the course online (Idris et al., 2020). Second Nature, therefore, is a prime example of how costs and efficacy can potentially be improved by commissioning evidence-based companies to deliver lifestyle interventions.

While NHS-DPP and Second Nature are comprehensive in their design, including coaching on diet, physical activity, and behaviour change techniques, the evaluations of their programmes were one dimensional, prioritising physical health measures such as blood glucose and weight loss. This limits any understanding of the potential mental or social benefits these prevention services provide.

Clark et al. (2011) in their evaluation of the 'Well Elderly 2,' a 6-month lifestyle-oriented occupational therapy-based intervention for older adults, included measures of mental and social health (i.e. social functioning) but failed to include physical health measures in their programme design, even though the intervention included physical activity. This is unfortunate and Harkness et al., (2010) recommended that lifestyle interventions include measures of both physical and mental health due to the potential synergy and dynamic relationship that exists between these health domains. One study that did include measurements from multiple health domains was the NICE recommended 'Lifestyle Matters' intervention for older adults which was evaluated using measures of mental health and loneliness (Mountain et al., 2017). Few studies, however, are evaluated holistically across physical, mental, and social health domains, which is likely a result of lifestyle interventions designed within the reductionist, biomedical model.

While lifestyle interventions such as those that include physical activity can improve aspects of mental and physical health, physical activity-only interventions may not be effective at improving social health measures such as loneliness in older adult populations. For example, in their systemic review and meta-analysis, Shvedko et al. (2018) concluded that group exercise interventions did not significantly reduce loneliness in older adults. Previous reviews by Cattan and White (1998), Findlay, (2003), Masi et al. (2011), and Gardiner et al. (2018) each concluded that physical activity and/or group exercise interventions were not effective at reducing loneliness in older adults. While this may be surprising, the physical activity and/or group exercise interventions included within these reviews did not utilise or encourage informal or formal social interaction within their study designs.

Shvedko et al. (2018) identified four physical activity interventions which encouraged social interaction, such as a group health discussion as part of their programme's design. Each of these social group exercise interventions proved to be effective at improving loneliness in older adults. For example, Ollonqvist et al. (2008), in their eight-month social group exercise intervention (n=708), found emotional loneliness was reduced in participants who underwent their group-exercise and health discussion intervention. Chan et al. (2017), in their pilot study (n=48), combined group-based tai-chi with home visits from social workers and found emotional loneliness reduced significantly after three-months in their older adult intervention group. Jones et al. (2019) in their ten-week social group exercise course (n=57) found participants with ≥80% attendance significantly reduced their overall loneliness and emotional loneliness. Similarly, Bender et al. (2019), in their unpublished social group exercise intervention, also found that after ten weeks, overall loneliness was significantly reduced in participants who underwent their group exercise and health discussion course. While these results may highlight the importance of including some form of social interaction as part physical activity and group exercise intervention design, Pels and Kleinert (2016) suggested the positive effects observed in social group exercise interventions are largely dependent on the quality of the relationships formed within the interventions, including those relationships formed between the participants and fitness instructor (s)/researcher (s). Regardless of the potential benefit, these social group exercise interventions were conducted in-person. Given the current reality of COVID-19-related

social distancing restrictions, innovative online approaches to improve aspects of mental, social, and physical health are required.

Online Lifestyle Interventions

The virtual fitness market experienced a boom following the outbreak of the COVID-19 pandemic (International Health, Racquet, and Sportsclub Association [IHRSA], 2021). For example, the online fitness company Fiit, experienced a 1,663% rise in subscriptions to their virtual exercise classes following the outbreak of COVID-19 in the UK and growth remained consistent once gyms were allowed to reopen (UKActive, 2021). Furthermore, Goldster, a UK based virtual fitness company for older adults, launched in October of 2019 and by February 2020 had tens of thousands of older adults attending their virtual classes weekly (Care Visions, 2021). The NHS-DPP also began piloting their 'digital stream' programme in 2020 (NHS, 2020).

Unfortunately, few online lifestyle interventions have been evaluated and those that have involved small sample sizes. For example, Johnson et al. (2019) utilised a combination of health apps, pedometers, and weekly one-to-one video conferencing (VC) between their obese participants (average age 44.5 years) and health coaches. The VC health coaching calls involved participants learning about nutrition, exercise, and behaviour change techniques from registered dieticians and exercise physiologists to help improve their lifestyle. After 12-weeks the VC group (n=10) achieved significantly greater weight loss, step counts, and insulin sensitivity from baseline to postintervention than the control group (n=10) who were only given pedometers. Similar effects were observed by Alencar et al. (2017) who performed one-to-one weekly health coaching video calls with registered dieticians and monthly video calls with medical doctors. Following their 12-week trial, participants in the treatment group lost significantly more body weight than the control group (Alencar, et al., 2017). The effects observed in these individualised health coaching interventions, however, were likely due to the one-to-one personalised advice and highly skilled health professionals, such as registered dieticians and medical doctors, which is unlikely to be applicable in a real-world setting. A more cost-effective approach was delivered by Azar et al. (2015) who delivered the US-DPP curriculum online through video conferencing (VC) in small virtual groups. After 12 weeks, the VC group (n=32) lost significantly more body weight (average loss was 3.2 kg) compared to the wait-list control group (n=32), which was likely due to the VC group having high adherence (75%) to the programme (Azar et al., 2015).

Other online lifestyle interventions evaluated only the mental health benefits of their programmes. Mailely et al. (2010) conducted a 10-week pilot trial (n=47) on the effects of their physical education online module plus twice monthly face-to-face physical activity counselling on mental health in US university students. Following their intervention, depression and anxiety remained unchanged, and self-efficacy worsened in both the treatment and control group. Follow-up interviews suggested that participants would have preferred a more interactive learning experience compared to the content provided by the online physical education module (Mailely et al., 2010). The second trial was from Ström et al. (2013) who evaluated their therapist-supported, online physical education module on its ability to improve mental health and physical activity level in adults (average age 49 years). At the conclusion of their nine-week intervention, depressive symptoms improved significantly in the treatment group compared to the wait-list control group, but anxiety, quality of life, and physical activity level remained unchanged in both the treatment and control groups. These mixed results may have been due to the trial's small sample size (n=48) and low adherence rate (58%) of participants in the treatment condition (Ström et al., 2013).

Following the outbreak of COVID-19, Bender and Myrissa (2020) conducted a non-controlled pilot study (n=18) of the online Walk and Talk for Your Life – Zoom (WTL-Z) lifestyle intervention in older adults. Following their 10-week social group exercise intervention, participants' depressive symptoms and feelings of loneliness improved significantly, but fruit and vegetable consumption and physical activity level remained unchanged. Informal qualitative feedback suggested the intervention was well-received and attendance to the twice weekly sessions was 85%.

Trail Rationale

Based on the results of the pilot trial from Bender and Myrissa (2020) and potential impact that WTL-Z could have to improve mental, social, and physical health in older adults, a larger more robust trial was

needed to evaluate the quantitative effects of WTL-Z. Due to the subjective nature of mental and social health, a qualitative explanatory sequential design was required to create a greater understanding of the quantitative results and participant experiences with WTL-Z. Lastly, functional fitness tests of strength and balance were used to determine the effectiveness WTL-Z to improve physical health. As a result of this review this trial's research questions are:

Research Questions
1) Can the ten-week WTL-Z intervention improve the mental, social, and physical health of London-based older adults during COVID-19 social distancing restrictions?

2) What reasons might be found that aid or hamper mental, social, and physical health outcomes in intervention participants?

Section 3
Trail Design, Methods, and Results

Trial Design
The WTL-Z trial used a pragmatic paradigm, using a mixed-methods, explanatory sequential experimental design, specifically the prototypical follow-up explanations variant. This trial consisted of 3 studies: Study 1 was a randomised control trail, which took place between 25 January – 6 April 2021. Study 2 was a qualitative study which followed an explanatory sequential design, where Study 1 participants were interviewed to learn more about their experiences with WTL-Z and provide an explanation for why health improvements were observed. Study 3 was a non-controlled quantitative study of WTL-Z which took place between 26 April – 2 July 2021. Study 3 gave members of the control group from Study 1 the opportunity to be evaluated and undergo the WTL-Z intervention. Each study's methods and results are presented together. For an overview of the trial see Figure 1.

STUDY 1: DESIGN AND METHODS
Hypothesis
The hypothesis of Study 1 was that mental and social health would improve significantly in participants following the WTL-Z intervention compared to the control group. Of the physical health measures, lower body strength and balance would improve significantly, but lifestyle behaviours, such as PA level and FV consumption would not improve significantly compared to the control group following the WTL-Z intervention.

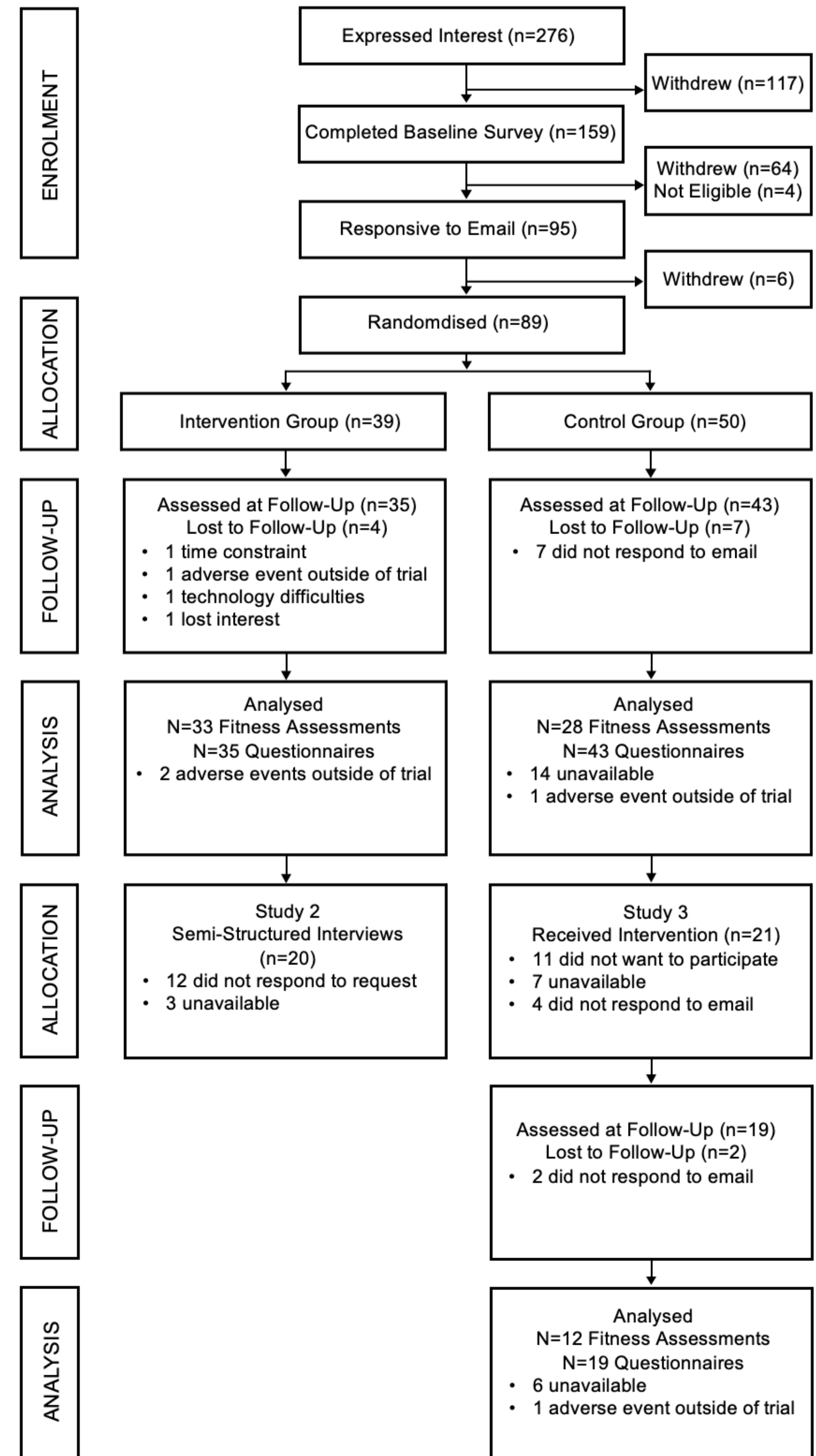
Sample
A minimum of 52 participants was required to demonstrate an effect in the primary outcome, loneliness, assuming participants were male and female adults of the general population between the ages of 50-85 from the greater London area. To determine sample size, a power of 80%, accounting for 10% drop-out, and an effect size of 0.4 were selected and entered into G*Power 3.1 software. This effect size was chosen as the average effect size of previous WTL-related work, which was 0.43 (Jones et al., 2019) and 0.35 (Bender and Myrissa, 2020) for loneliness using the De Jong Gierveld Scale. The later study also proved to be feasible and acceptable demonstrating ≥ 80% adherence rate, 88% retention rate and was acceptable or highly acceptable by ≥ 95% of participants (Bender and Myrissa, 2020).

Exclusion Criteria
Participants that (a) have been advised by their physician that exercise is contraindicated (e.g. the participant has unstable coronary heart disease, disseminated cancer, severe osteoporosis, or uncontrolled hypertension with resting systolic blood pressure (SBP) > 180 mmHg or resting diastolic blood pressure (DBP) > 100 mmHg), (b) were unable to understand English sufficiently enough to participate in the health discussions, (c) did not have access to Zoom (d) were unavailable to participate (e) did not live in the greater London area (f) were younger than 50 years old, and (g) did not respond to email were excluded from the study.

Recruitment

Participants were recruited to join the study from December 2020 – January 2021. Facebook marketing was the most effective strategy for recruiting participants (50%) followed by networking with local organisations (21%), word of mouth (9%), referrals from social prescribing (7%), and 13% of participants were either

Figure 1. Participant Timeline: Consolidated Standards of Reporting Trials (CONSORT)-style diagram.



unaware of how they found out about the study or selected 'other' as a reason for their enrolment (data not tabled). Recruitment costs were subsidised via grant funding provided by UnLtd, a charity that supports social entrepreneurs.

Protocol
Study 1 evaluated WTL-Z utilising an RCT design. Interested participants were directed to read the participant information sheet (PIS) and digitally sign the consent form (Appendix 1). The PIS and consent form provided informed consent for participation throughout the trial if eligible. Following the completion of the PIS and consent form, participants were directed to complete the baseline questionnaire via Qualtrics.com (Appendix 2). Participants then read and digitally signed the participant code of conduct, which outlined the rules and expectations for the participants to follow during the intervention, specifically during the group discussions where sensitive topics were likely to arise. Next, participants completed the health screen questionnaire (Appendix 3) and provided their emergency contact information to the researcher. Participants were then invited to schedule an 'onboarding' Zoom call with the researcher to answer any participant questions and conduct the fitness assessments, which consisted of the unipedal stance and 30s Sit-to-Stand Tests. Participants who were unable to complete the prerequisite balance challenges outlined in the 4 Stage Balance Test did not attempt the one-legged balance test due to safety.

Participants were assigned a participant number on the day of randomisation and stratified sampling was conducted to ensure a similar ratio of males to females in each arm of the trial. Following the stratified sampling, simple random sampling was conducted by a computer-generated number randomiser to assign participants into intervention and control groups. Participant numbers 1-39 were assigned to intervention participants and numbers 40-89 were assigned into the control group. This imbalanced sampling was based on previous iterations of WTL-Z to account for the higher drop-out rate, which is likely to occur in the control group participants compared to those who are part of the WTL-Z intervention. Randomisation took place on 18 January 2021.

Intervention group participants were divided, by the researcher, into four subgroups of 8-10 participants, based on each participant's availability. The intervention took place from 25 January - 2 April and each subgroup met twice per week, for a total of 20 sessions over 10 weeks. Each session was 90 minutes and began with 15 minutes of informal socialising followed by 30 minutes of stretching, Otago balance exercises, shadow boxing, and bodyweight strengthening exercises. This was followed by a short break (2-3 minutes) before participants returned to their screens to engage in a 40-minute discussion on a health topic. The discussion topic curriculum surrounded the themes of relaxing, eating, moving, sleeping, socialising, finding purpose in life, and behaviour change. The discussion topic curriculum also included three behaviour change workshops, where participants worked together in smaller groups of 2-3 using Zoom's breakout room function, to create or break habits which would support their health goals. This behaviour change model was based on the research from Fogg (2009). For the full list of discussion topics see the Walk + Talk Instructor's Manual.

The day before each session, participants received a customised email from the researcher, which included updates to any participant questions, a reminder of the upcoming class with the appropriate Zoom link, as well as a link to a short YouTube lecture or TED Talk (<20 min) surrounding the upcoming health topic. While the screen share option on Zoom was sometimes utilised by the researcher to display useful references and resources, such as prepared PowerPoint slides, glycaemic index charts and health guidelines, the researcher prioritised interactive discussion and asked participants leading and open-ended questions surrounding the health topic of the day. This often led to participants sharing their stories, asking questions of each other, and offering advice based on their experiences. Following the conclusion of each session, participants received an email, which recapped the group discussion and included links to relevant articles and videos for further investigation.

In addition to the sessions themselves, the researcher established Whatsapp groups for each intervention sub-group to report their estimated daily step counts. Each intervention sub-group established a team name (e.g. History Bluffs, Ninja Knitters, and Fire Stormers) and competed against each other throughout the intervention period in a 'virtual walking challenge' across New Zealand (1,039 miles). As well as encouraging participants to increase their step count, the Whatsapp groups provided participants with additional socialising, networking, and support between WTL-Z sessions.

Control group participants were provided lifestyle information via email throughout the study period and were signposted to join online exercise classes (e.g. Goldster.co.uk) and NHS sponsored dietary intervention programmes including NDPP and Second Nature. Providing basic health information and signposting to control group participants was utilised by Johnson et al. (2017) who conducted a similar 12-week lifestyle intervention called One Body One Life. Furthermore, Fleming and Godwin (2008) in their systematic review of lifestyle interventions suggested that the distribution of basic lifestyle messages could act as usual care for control participants. Following the completion of the study, all participants were encouraged to complete the follow-up survey (Appendix 4) and functional fitness tests (i.e., 30s Sit-to-Stand and 4 Stage Balance) (Appendix 5 and 6) with the researcher.

Data Collection

Participants completed surveys before and after the intervention via Qualtrics.com (see Appendices 2 & 5 for questionnaires). The surveys contained questions about demographics, socioeconomic status (SES), and availability to participate in the study. Mental health was measured with the Patient Health Questionnaire (PHQ-9) (Kroenke et al., 2001), Generalised Anxiety Disorder Assessment (GAD-7) (Spitzer et al., 2006), and Short Warwick- Edinburgh Mental Well-being Scale (SWEMWBS) (Stewart-Brown et al., 2009). Social health was evaluated by the 6-Item de Jong Gierveld Loneliness Scale (DJG-LS) (de Jong Gierveld & Van Tilburg, 2006). To assess lifestyle behaviour changes, the three question Godin Leisure-Time Exercise Questionnaire (Godin, 1985) and the direct question of daily FV consumption, as used by Johnson et al. (2017), were included. In order to minimise potential barriers to join WTL-Z, participants were required to submit their first name, email address, and complete the DJG-LS questionnaire. All other questions within the baseline survey were programmed to remind participants to complete the question, however, responses were not required prior to submission. Furthermore, at the conclusion of Study 1, three control group participants who failed to complete the longer follow-up survey email were compliant when asked to complete a shorter follow-up questionnaire which only included first name, email address, and the DJG-LS questionnaire.

Participants who were responsive to email and agreed to participate, completed functional fitness assessments with the researcher via Zoom before and after the intervention. To measure changes in participants' physical ability to balance, they were evaluated using a one-legged stand test based on the protocol of the 4-Stage Balance Test (CDC, 2017; Appendix 5). Due to safety, only those participants who could complete the necessary prerequisites, as outlined by the 4-Stage Balance Test, were assessed. Participants were stopped by the researcher if their time during the one-legged stand test exceeded two-minutes due to time restraints. To assess lower body strength, the 30-second Sit-to-Stand test (CDC, 2017; Appendix 6) was utilised. Due to the online nature of these assessments, participants were instructed to position their cameras at an angle where they could be effectively evaluated. Furthermore, participants were instructed to remember and utilise the same footwear for the before and after assessments and to use a chair which was approximately 17 inches in height for the 30s Sit-to-Stand Test to reduce additional variables.

Data Analysis

Statistical analysis was carried out using IBM SPSS Statistics V.27 for Mac (IBM Corporation, Armonk, NY). Within-group changes were measured by Mann-Whitney U Tests. Analysis of covariance (ANCOVA) was carried out to determine between-group changes. To evaluate the holistic effects of WTL-Z a composite score was created using T-scores. The composite score was equally weighted and combined measures of depression (PHQ-9), anxiety (GAD-7), wellbeing (SWEMWBS), loneliness (DJG-LS), FV intake and PA Level (Godin-Leisure Physical Activity Questionnaire). Those participants with missing data were excluded from the composite variable analysis. The use of this type of composite score as a holistic measure of health combining these instruments have not been used previously according to the author's knowledge. This type of composite or summary score, however, was established from recommendations by the Agency for Healthcare Research and Quality (2019).

STUDY 1: RESULTS

Two-hundred and seventy-six participants expressed interest in joining WTL-Z and one-hundred and fifty-nine participants completed the baseline survey and agreed to take part in the study. Completion of the baseline survey was defined as completing 69% or more of the survey. Facebook ads or posts were the most

successful recruitment strategy (50%) followed by networking (21%) with London-based organisations such as AgeUK, Mind, and various community centres. Word of mouth (9%) and social prescribing / GP surgeries (7%) were other notable recruitment strategies while 13% of participants were recruited by other means or unsure of how they learned about the study. The majority of participants who withdrew throughout the study did not give a reason for their withdrawal; they were simply unresponsive to the email. Of those participants (n=4) not eligible to enrol in the study the primary reason was due to age (<50 years old). No adverse events were reported within the trial. One participant in the control group of Study 1 reported an adverse event outside the trial (myocardial infarction, which was non-fatal). Other adverse events which took place outside the trial included falls (n=2), mental health deterioration (n=1), and surgery (n=1), which prevented participants from conducting the fitness assessments.

Baseline Survey Findings

Of the participants (n=155) who completed the baseline survey and were eligible to join the study, 70% (n=109) were lonely as defined by de Jong Gierveld & Van Tilburg (2006) (scoring ≥ 3 on their 7-point Likert loneliness scale). Furthermore, 61% of 151 participants initially surveyed were likely to have a mild to severe symptoms of depression according to the PHQ-9 scale (Kroenke et al., 2001) (scoring ≥ 5 out of their 0-27 depressive severity scale). Mild to severe symptoms of anxiety were reported in 53% of the sample (n=141) according to the GAD-7 (Spitzer et al., 2006) (scoring ≥ 5 out of their 0-21 anxiety severity scale). Lastly, 32% of participants were categorised as having low wellbeing while only 6% of an initial sample of 149 participants were categorized as having a high wellbeing according to the short version of the Warwick–Edinburgh Mental Wellbeing Scale (SWEMWBS) (Stewart-Brown et al., 2009).

In terms of ethnicity, the study was successful at recruiting a diverse sample (51.1% Caucasian) which was ethnically representative of the population of London (59.8% Caucasian) (England Census, 2011). Furthermore, this study recruited a representative sample of older adults who rented from social housing (15.9%) compared to the England average (17% of households). This study failed to recruit a sample that was gender balanced (only 17.1% of participants were male).

Table 1. Baseline demographics, mental, social, and physical health measures of all participants.

Demographics	Sample	n (%)
Age (years), mean (SD)	149	64.1 (8.9)
Male gender	155	16 (10.3)
Caucasian ethnicity	154	100 (64.9)
Married/common law	146	57 (39.0)
University degree	154	76 (49.4)
Annual income >£40k	111	17 (15.3)
Homeowners	151	101 (66.9)
Social housing renters	151	24 (15.9)
Retired	146	73 (50.0)
Living alone	155	63 (40.7)
Moderate - Severe Depression	151	42 (27.8)
Moderate – Severe Anxiety	141	28 (19.9)
Low Wellbeing	149	47 (31.5)
Lonely (≥ 3)	155	109 (70.3)
Mental Health Measures	**Sample**	**Mean (SD)**
PHQ-ADS	143	13.2 (10.8)
PHQ-9 Depression	151	7.4 (6.4)
GAD-7 Anxiety	141	5.9 (5.3)
SWEMWBS Wellbeing	149	20.9 (3.6)
Social Health Measures	**Sample**	**Mean (SD)**
Total Loneliness	155	3.7 (1.9)
Emotional Loneliness	155	1.8 (1.1)
Social Loneliness	155	1.9 (1.2)
Lifestyle Behaviours	**Sample**	**Mean (SD)**
Godin PA Score	134	36.3 (28.6)
FV Intake	155	5.4 (3.0)

PHQ-ADS, Patient Health Questionnaire Anxiety-Depression Scale; PHQ-9, Patient Health Questionnaire 9-item; GAD-7, General Anxiety Disorder Assessment – 7; SWEMBWBS, short version of the Warwick–Edinburgh Mental Wellbeing Scale; PA, physical activity; FV, fruit and vegetable

Baseline Measures of Randomised Participants

Ethnic minorities and participants who rented from social housing were more likely to be unresponsive to email following their completion of the baseline survey and subsequently, to withdraw from being

randomised into the Study 1. Therefore, participants in Study 1 were more likely to be Caucasian and less likely to rent from social housing than the original cohort of participants who were recruited into the trial. The control and intervention groups were statistically significantly different at baseline in total loneliness (p=0.005). Control group participants also had greater mental health scores on average and were notably stronger in the 30s Sit-to-Stand test at baseline compared to the intervention group, although these differences were not statistically significant.

Table 2. Baseline demographics and mental, social, and physical health measures by group (control and intervention) and overall sample.

Demographics	n	Control n (%)	n	Intervention n (%)	n	Overall n (%)	p-value
Age (years), mean (SD)	43	66.2 (7.4)	35	64.6 (9.2)	78	65.5 (8.1)	0.329
Male gender	43	5 (11.6)	35	4 (11.4)	78	9 (11.5)	0.978
Caucasian ethnicity	43	37 (86.0)	35	26 (74.3)	78	63 (80.7)	0.320
Married/common law	41	18 (43.9)	32	13 (40.6)	73	31 (42.5)	0.782
University degree	43	26 (60.5)	34	19 (54.3)	77	45 (58.4)	0.690
Annual income >£40k	35	8 (22.9)	25	3 (12.0)	60	11 (18.3)	0.318
Homeowners	43	32 (74.4)	34	24 (70.6)	77	56 (72.7)	0.978
Social housing renters	43	5 (11.6)	35	4 (11.4)	78	9 (11.5)	0.750
Retired	43	27 (62.8)	34	19 (55.9)	77	46 (59.7)	0.454
Living alone	43	19 (44.2)	35	19 (54.3)	78	38 (48.7)	0.381
Two or more chronic diseases	40	19 (47.5)	35	22 (62.9)	75	41 (54.7)	0.187
Five or more medications	40	7 (17.5)	35	7 (20.0)	75	14 (18.7)	0.785
CEV	40	3 (7.5)	35	2 (5.7)	75	5 (6.7)	0.761
Moderate - Severe Depression	40	5 (12.5)	35	9 (25.7)	75	14 (18.7)	0.251
Moderate – Severe Anxiety	40	7 (17.5)	35	10 (28.6)	75	17 (22.7)	0.265
Low Wellbeing	40	8 (20.0)	35	12 (34.3)	75	20 (26.7)	0.172
Lonely (≥3)*	43	23 (53.5)	35	29 (82.9)	78	52 (66.7)	0.005
Mental Health Measures	**n**	**Median (IQR)**	**n**	**Median (IQR)**	**n**	**Median (IQR)**	**p-value**
PHQ-ADS Total	40	9.0 (12.7)	35	10.0 (13.0)	75	9.0 (13.0)	0.470
PHQ-9 Depression	40	5.0 (5.8)	35	6.0 (8.0)	75	5.0 (6.0)	0.273
GAD-7 Anxiety	40	4.0 (6.0)	35	5.0 (6.0)	75	5.2 (5.2)	0.612
SWEMWBS, mean (SD)	40	22.1 (3.5)	35	20.9 (4.3)	75	21.6 (3.9)	0.145
Social Health Measures	**n**	**Median (IQR)**	**n**	**Median (IQR)**	**n**	**Median (IQR)**	**p-value**
de Jong Total Loneliness*	43	3.0 (3.0)	35	4.0 (3.0)	78	3.0 (3.0)	0.005
Emotional Loneliness*	43	1.0 (2.0)	35	2.0 (2.0)	78	2.0 (2.0)	0.021
Social Loneliness*	43	1.0 (3.0)	35	3.0 (2.0)	78	2.0 (2.0)	0.018
Lifestyle Behaviours	**n**	**Median (IQR)**	**n**	**Median (IQR)**	**n**	**Median (IQR)**	**p-value**
Godin PA Score	38	31.0 (36.0)	35	29.0 (47.0)	73	30.5 (38.0)	0.991
FV Intake (servings / day)	38	5.0 (3.0)	32	5.0 (2.0)	70	5.0 (2.0)	0.483
Fruit Intake	38	2.0 (1.0)	32	2.0 (2.0)	70	2.0 (2.0)	0.985
Vegetable Intake	38	3.3 (1.7)	32	2.6 (1.1)	70	3.0 (2.0)	0.201
Functional Fitness Measures	**n**	**Median (IQR)**	**n**	**Median (IQR)**	**n**	**Median (IQR)**	**p-value**
30 Second Sit-to-Stand (reps)	27	13.5 (6.0)	32	11.0 (4.0)	59	12.0 (18.0)	0.062
One Legged Balance (s)	20	40.8 (39.9)	30	43.9 (56.4)	50	41.2 (46.5)	0.463

StatisticalSignificance ($p < 0.05$) was calculated using independent samples t-test and Mann-Whitney U test where appropriate. Loneliness was determined by participants scoring ≥ 3 on the de Jong Total Loneliness Scale.
CEV, clinically extremely vulnerable; PHQ-ADS, Patient Health Questionnaire Anxiety-Depression Scale; PHQ-9, Patient Health Questionnaire 9-item; GAD-7, General Anxiety Disorder Assessment – 7; SWEMBWBS, short version of the Warwick–Edinburgh Mental Wellbeing Scale; PA, physical activity; FV, fruit and vegetable

Table 3. Mann Whitney U Tests of mental, social and physical health measures in Study 1 participants.

			Pre Scores				Post Scores			
Measure	**Group**	**n**	**Mean Rank**	***U***	***z***	***p*-value**	**Mean Rank**	***U***	***z***	***p*-value**
Depression	Control	40	35.4	597.0	-1.097	0.273	37.4	677.0	-0.246	0.806
	Intervention	35	40.9				38.7			
Anxiety	Control	40	36.8	652.5	-0.507	0.612	38.3	687.0	-0.139	0.889
	Intervention	35	39.4				37.6			
Wellbeing	Control	40	42.2	533.0	-1.778	0.075	37.3	673.0	-0.282	0.778
	Intervention	35	33.2				38.8			
Loneliness	Control	43	33.1	476.0	-2.823	0.005	37.9	684.0	-0.699	0.485
	Intervention	35	47.4				41.5			
PA Level	Control	38	37.0	664.0	-0.110	0.991	32.1	479.0	-2.054	0.040
	Intervention	35	37.0				42.3			
FV Intake	Control	38	38.7	602.5	-0.701	0.483	36.2	633.5	-0.351	0.725
	Intervention	35	35.2				37.9			
Sit-to-Stand	Control	25	33.6	285.0	-1.864	0.062	29.9	376.5	-0.381	0.703
	Intervention	32	25.4				28.3			
Balance	Control	20	27.4	263.0	-0.734	0.463	22.3	236.0	-1.430	0.153
	Intervention	30	24.3				28.4			

Changes in Health Outcomes

All variables were non-parametric and Mann-Whitney U tests were carried out post-intervention (See Table 3). Statistical significance was observed in PA level with the intervention group improving significantly compared to the control group, (U = 479.00, z = -2.054, p = 0.040). All other between-subjects variables were non-significant at follow-up.

Composite Variable Analysis

To create a holistic perspective on the effects of WTL-Z across health domains a composite variable was created. Measures of depression, anxiety, wellbeing, loneliness, PA level, and FV intake were converted into T-scores, equally weighted, and combined to create a composite variable from pre-scores and post-scores. Due to missing data, functional fitness measures were not included as part of the composite variable. Furthermore, participants with missing data in any of the sub-variables were excluded from the analysis. The composite variable was normally distributed and groups (i.e. control and intervention) baseline measures were non-significant (p=0.089). Homogeneity of regression also proved non-significant (p=0.147). Therefore, assumptions of ANCOVA were met. The composite post-test score was the dependent variable, composite pre-test was the covariate, and group was the independent variable. ANCOVA revealed a statistically significant difference between groups (p=0.004) with a medium to large effect size (η^2 = 0.12).

Table 4. ANCOVA results of change in composite health score between Study 1 participants.

			Pre Scores			Post Scores					
Measure	**Group**	**n**	**Mean**	**SD**	**SE**	**Mean**	**SD**	**SE**	***F*-value**	***p*-value**	**η2**
Composite	Control	37	51.17	5.67	0.93	49.32	6.00	0.98	8.940	0.004	0.12
	Intervention	35	48.47	7.50	1.27	50.28	6.50	1.10			

Subjective Data and Informal Feedback
In the follow-up survey participants were asked direct, subjective questions about their balance, strength, body weight, and chronic condition (if applicable). These questions were based on a 5-point Likert scale. Among intervention group participants, 80% believed their balance improved or significantly improved and no participants felt their balance worsened, 91% reported feeling stronger or significantly stronger and no participants reported feeling weaker, and 34% of participants felt they lost weight and no participants reported feeling they had gained weight. Of those participants (n=28) who reported having at least one chronic condition, 50% felt their chronic condition improved or significantly and no participants felt their chronic condition worsened over the intervention period. 100% of participants felt satisfied or very satisfied with their experience as part of WTL-Z intervention group.

Among control group participants, 23% believed their balance improved or significantly improved while 20% felt it had worsened and 30% felt stronger or significantly stronger while 25% felt weaker. Of those participants (n=31) who reported having at least one chronic condition, 16% felt their chronic condition improved or significantly improved, while 16% felt their chronic conditioned worsened or significantly worsened over the intervention period.

The final question on the follow-up survey allowed intervention participants to provide written feedback about whatever they felt appropriate to include describing their experience with WTL-Z. All participants (n=35) completed this question, and responses were consistent with the themes that emerged in Study 2. A single participant, who was not interviewed in Study 2, mentioned that he did not agree with some of the nutritional guidance offered during the Walk + Talk course (see Appendix 7 for a list of the full responses).

Control group participants were also asked if they had consistently attended or participated in any of the exercise and health related programmes recommended to them via WTL-Z related emails throughout the control period. They were also offered a space to provide open-ended feedback about their experience as part of the control group. Of the 37 participants who answered these questions, 3 participants reported that they joined and consistently attended one of the recommended programmes. For example, one control group participant in their open-ended feedback wrote:

> *'Thanks for suggesting Second Nature- I have lost nearly 10kg and learned a lot about the psychology of eating. I have started a little more exercise but could do with some help. I would like to get back on a bike! During this time, I have continued with my zoom Pilates - 2 short classes and a 1-1 session each week and some walks plus "snack exercise" when I remember! I have also just started to see a counsellor on a weekly basis for help with a relationship issue. Your contact prompted me to look at myself mentally and physically and see what I can improve'. – Participant 138, female, 65 years old*

An additional 15 participants reported that they consistently attended an exercise or health related programme, which was unrelated to those recommended by WTL-Z. Furthermore, one participant, during the follow-up functional fitness assessment, mentioned that they found the lifestyle related information helpful, which was emailed to control group participants every other week (see Appendix 8). Lastly, two participants, in their written feedback, credited the researcher and the tips he gave them during their initial functional fitness assessment together with influencing their healthy habits. These two participants reported:

> *'As a result of your recommendation to build exercise into my routine, I have been doing press-ups before every shower, which has had a noticeable effect on my upper body strength already.'*
> *– Participant 155, male, 66 years old*

> *'Useful tips from Walk & Talk course facilitator Nicholas on general health & well-being. From the first consultation I had with Nicholas I have continued exercise and added a daily mile walk in the park. I have also joined Slimming World and lost almost a stone in weight.' – Participant 163, female, 66 years old*

STUDY 2: DESIGN AND METHODS
Following the conclusion of Study 1, a subgroup of intervention group participants were interviewed to learn more about their experience with WTL-Z and to achieve an explanation of their results from Study 1. The themes which emerged from the qualitative data were compared and corroborated with the quantitative findings to determine the results of the study. The intent of integration followed the guidance of Creswell and Plano-Clark (2011) specifically their explanatory sequential design of the prototypical follow-up explanations variant.

Theoretical Perspective
While there may be a theory that operates to explain the phenomenon of this study, it is also be important to assess the varied individual input into the nature of the phenomenon and therefore the ontology of Study 2 was singular and multiple realties (Creswell and Plano-Clark, 2011). The epistemology is practicality (pluralist). This approach helped the researcher use 'what works' and real-world practice to answer the research questions. This approach is also embraced as an overarching philosophy by a large number of mixed-methods scholars to inform the problems under study (Tashakkori and Teddlie, 2003).

Sample
A total of 20 participants who completed the WTL-Z intervention within Study 1 underwent semi-structured interviews with the researcher. No control group participants or intervention group participants of Study 3 were interviewed.

Recruitment
All Study 1 WTL-Z participants were asked via email following the completion of the quantitative study if they would like to take part in Study 2. Following the initial email, 16 participants, all female, agreed to take part in Study 2. All male participants were emailed a second time and encouraged to join Study 2. Of the male participants only one agreed to join Study 2. Participant 16 was emailed and encouraged to join Study 2 to help balance the representation of participants from each of the four intervention subgroups. Participant 31 was purposefully sampled due to the large improvement observed in her mental and social health data during Study 1. Conversely, Participant 2 was purposefully sampled due to the worsening observed in her social health data during Study 1.

Ethical Considerations
The researcher practiced reflexivity by utilising a research journal and logged entries twice per week as well as following each interview. The nature of the study topic meant the researcher was aware that sensitive topics may arise in the interviews. The researcher was careful to build rapport and trust with participants especially at the beginning of the interview to create a safe and confidential environment (Nijhawan et al., 2014). Informed consent took place before the initial interview, when participants read the PIS and signed the consent form to take part in the trial. Obtaining informed consent involved informing the participants of their rights, confidentiality, the procedures, purpose, and potential risks of the study, and this procedure met the ethical requirements for research involving humans (Nijhawan et al., 2014).

Data Collection
A total of 20 semi-structured qualitative interviews were conducted 6 – 10 weeks post WTL-Z intervention between June-July 2021. The interviews were conducted by the researcher and took place via Zoom. Interviews ranged from 25 to 64 min in length, were audio recorded via Zoom, and transcribed verbatim within 24 hours following the completion of the interview. Based on recommendations from Corden and Sainsbury (2007) participant numbers were used for anonymity rather than pseudonyms. The list of the interview prompts which were used in this study can be found at Appendix 9.

Data Analysis
Analysis was undertaken once all interviews had been completed. All interviews were transcribed within 24 hours after each interview (Appendix 10). Transcripts were read twice for familiarisation and then coded into themes. The transcripts were coded in the NVivo software package; NVivo 12 (QSR International). Thematic analysis was conducted using the step-by-step approach outlined by Nowell et al., (2017). Thematic analysis began with the researcher coding the data via content analysis. Once content analysis was

completed, the data was recoded via emergent analysis. Quotations were sorted into their relevant codes (Ryan and Bernard, 2003) and these codes were be organised by homogeneity. Finally, these codes were be sorted into clusters, themes, and sub-themes to remain consistent with the qualitative analysis conducted by Jones et al. (2019).

STUDY 2: RESULTS

Explanatory Follow-Up Quantitative Analysis

A total of 20 participants (19 female, 1 male) were interviewed and participant characteristics are described in table 3. Study 2 participants represented similar demographic characteristics with the Study 1 sample (See Table 5). Content analysis revealed two clusters: 1) the benefits of WTL-Z and 2) reasons for health improvements and three clusters were formed following emergent analysis revealed: 3) lockdown experience, 4) relationship with diet and exercise, and 5) socialising online (see Figure 2). Participants

Table 5. Baseline demographics of Study 1 WTL-Z intervention participants (N=35) compared to Study 2 participants (n=20).

Demographics	Study 1 Ppts n (%)	Study 2 Ppts n (%)	*p*-value
Age (years), mean (SD)	**64.6 (8.9)**	**64.5 (8.8)**	**0.960**
Male gender	**4 (11.4)**	**1 (5.0)**	**0.177**
Caucasian ethnicity	**26 (74.3)**	**17 (85.0)**	**0.340**
Married/common law	**13 (40.6)**	**6 (30.0)**	**0.524**
University degree	**19 (54.3)**	**10 (50.0)**	**0.773**
Annual income >£40k	**3 (12.0)**	**3 (15.0)**	**0.580**
Homeowners	**24 (70.6)**	**16 (80.0)**	**0.766**
Social housing renters	**4 (11.4)**	**2 (10.0)**	**0.843**
Retired	**19 (55.9)**	**11 (55.0)**	**0.960**
Living alone	**19 (54.3)**	**12 (60.0)**	**0.445**
Two or more chronic diseases	**22 (62.9)**	**15 (75.0)**	**0.353**
Five or more medications	**7 (20.0)**	**5 (25.0)**	**0.681**
CEV	**2 (5.7)**	**1 (5.0)**	**0.912**

*Statistical Significance ($p < 0.05$) was calculated using independent samples t-test
CEV, clinically extremely vulnerable

were not asked a direct question about their experience with WTL-Z, any perceived benefits, or limitations of the programme. Instead, participants were asked broad questions such as "How they had been getting on with lockdown," "What factors led up to them joining WTL-Z," "How they found exercising online," and "What their views were about loneliness."

Cluster 1: Benefits of WTL-Z

Participants consistently shared the health benefits they felt from WTL-Z, which were categorised into three themes: 1) mental, 2) social, and 3) physical health benefits. Benefits to participants' mental health were coded on 49 occasions by 13 of the 20 participants. Examples include:

> *'The course was really one of the things that helped me to kind of get out of that little hole that I was in.' - Participant 13, female, 54 years old*
>
> *'Before I joined the walk and talk, I think I was on a downward spiral to be honest, not that I noticed it as much as I now realise.' - Participant 35, female, 68 years old*
>
> *'I think that this, this course has helped with my mood.' - Participant 28, female, 81 years old*
>
> *'It gave me that confidence to start the dog walking business, which has had a massive impact on me and my mental health.' – Participant 31, female, 53 years old*
>
> *'I'm grateful that I wasn't sort of so low that I had to go back to taking, you know, 150 to 200 milligrams of Zoloft. Like now I'm talking with my GP, once I'm working nine months to taper off*

getting on the medication. I've realised exercise is integral to my mental health, and the healthy diet, not eating junk food, and not buying cheap food for the sake of it.' – Participant 19, female, 52 years old

Figure 2. Clusters, themes, and sub-themes.

Cluster	Theme
1. Benefits of WTL-Z	1.1 Mental Health Benefits
	1.2 Social Health Benefits
	1.3 Physical Health Benefits
2. Reasons for Health Improvements	2.1 Facilitation of WTL-Z
	A. Instructor's Influence
	B. Programme Design
	C. Routine and Structure
	2.2 Empathy and Belonging
	A. Cohesion
	B. Peer Support
3. Lockdown Experience	2.3 Empowerment
	A. Learning and Education
	B. Confidence
	C. Initiating Action
4. Relationship with Diet and Exercise	
5. Socialising Online	

Social health benefits were coded on 63 occasions by 17 of the 20 participants. Examples include:

'I think the, the lockdown, and, you know, has, has caused so many people, including me, frankly, to, you know, to feel to feel lonely. I do feel dreadfully alone, alone and lonely and so being able to meet all of you guys, you know, twice a week, helped with that connection. It really did help with the connection.' – Participant 3, female, 74 years old

'I didn't even think I realised I was lonely. I don't think I even knew that, because I was more about being safe in my house, then that was my sort of red flag, I need to be safe in my house. So I don't think I realised how much I liked other people's company til that company in that group.' – Participant 31, female, 53 years old

'I've now got a bunch of friends, I consider them [i.e. the other WTL-Z participants] friends, although I haven't met them yet [i.e. in the flesh].' – Participant 24, female, 53 years old

'I don't think I know the people as well in my Pilates class or have felt that connection with people in my Pilates class and I've been going there for about 10 years, as I did with the people, I miss the people, in the Walk and Talk group.' - Participant 35, female, 68 years old

'It was nice to socialise, I really liked going to your zoom meetings, I felt I was I was doing something a little bit different, I was learning things, but also it's quite nice meeting new people because during lockdown, you don't have the opportunity to meet new people so much.' - Participant 10, female, 55 years old

'I'm living on my own and that being part of your course, was just a real icing on the cake for me. It just gave me routine, friendship, exercise. It was just, it was just, what the doctor ordered, and I really think it helped sustain me during that very long period.' – Participant 1, female, 68 years old

Physical health benefits were coded on 35 occasions by 16 of the 20 participants. Examples include:

> *'I'm still doing the 10,000 steps.' – Participant 10, female, 55 years old*

> *'I signed up for the June challenge for cancer research and it was a 60 mile.. 60 miles in June or something and I've done 60 miles in the first week. So that's how it works, without that other walking challenge, I wouldn't have thought to look for another challenge.' – Participant 31, female, 53 years old*

> *'I started to be better at preparing meals or healthy meals and that's quite important and the course has helped on that.' - Participant 2, male, 71 years old*

> *'I'm sure talking about nutrition has been very important and now I have eaten a lot more vegetables and eating vegetables that I didn't eat before hardly at all like carrots. I discovered pleasure in carrots. Buying the Morrison's organic carrots for example.. and so I I look for health, I look for organic things, especially what you can get at Lidl or at other places. So I think more vegetables with a salad you know with different coloured things and peppers and cut them up in and spring onions you know things that I didn't do before.' - Participant 2, male, 71 years old*

> *'Physically, I feel much better, I'm eating better.' – Participant 33, female, 62 years old*

> *'I certainly built up some muscles, which were much needed in my legs and things.' - Participant 35, female, 68 years old*

> *'that has made me feel much stronger, and more capable of doing things that I should be doing.' – Participant 28, female, 81 years old*

> *'My balance has got better.' – Participant 28, female, 81 years old*

> *'I would say, my balance has got better, I mean, I do, I've, I've felt stronger in that respect. And actually, the little, little tips of, you know, standing on one leg and waiting for the kettle to boil. And, you know, that's, that's all been great. And, I mean, balance was a was a problem for me.' – Participant 3, female, 74 years old*

Cluster 2: Reasons for Health Improvement

Cluster 2 provides a conceptual explanation to explain the reasons for the overall health improvement observed in WTL-Z participants (see Figure 3). Participants were not asked directly about why they believed their health across domains had improved, but the subject arose most frequently when participants were asked "How they had been getting on with lockdown," and "How they found exercising online?" Content analysis revealed that three themes 1) facilitation of WTL-Z, 2) empathy and belonging, and 3) empowerment and support.

Theme 1: Facilitation of WTL-Z

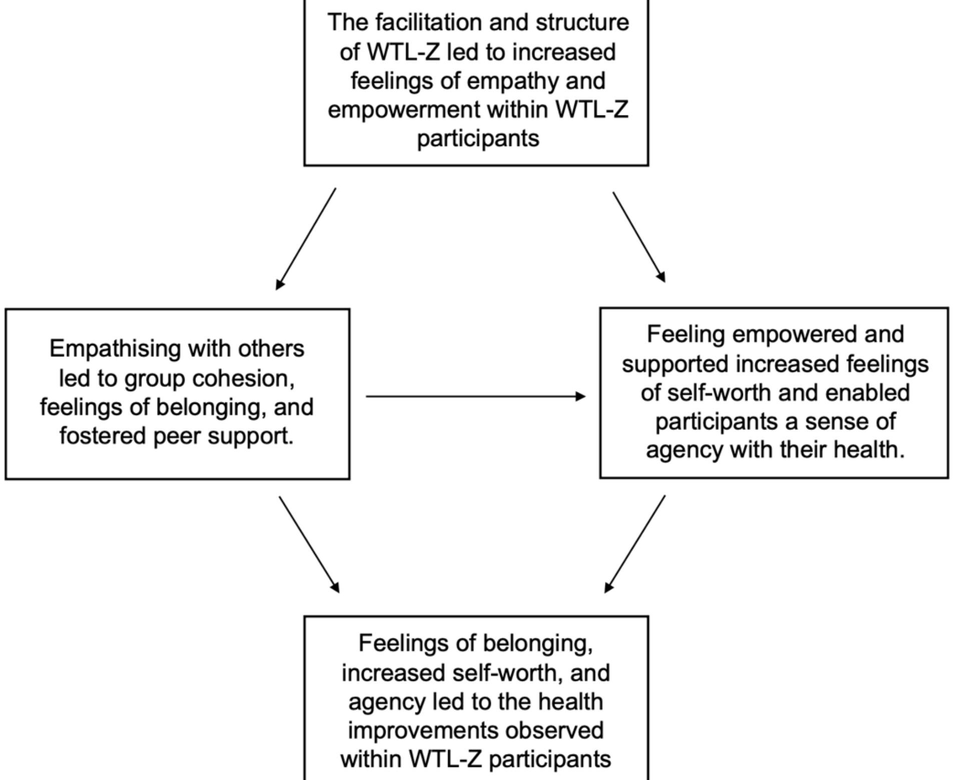
The observed improvements in health across all domains, were at least in part due to participants involvement with WTL-Z and its facilitation. A subtheme was the 'instructor's influence', which was coded on 35 occasions by 10 of the 20 participants. Examples include:

> *'I mean, obviously, I think the success of it, in a lot of ways, did depend on the personality and the skills of the person that was leading it [referring to the WTL-Z instructor]' – Participant 35, female, 68 years old*

> *'I'm sure the person's personality that would run these courses would be an important factor. And, yeah, I think you've [referring to the researcher] been really easy to talk to, really open, I think you've welcomed whatever anybody's got to say.' - Participant 23, female, 65 years old*

'You [referring to the researcher] were always just so calm and just so.. I don't know, welcoming and that made such a difference.' – Participant 31, female, 55 years old

Figure 3. A conceptual explanation for the health improvement observed in WTL-Z participants.



A second subtheme was the 'routine and structure' WTL-Z provided due to the twice weekly sessions. This subtheme was coded on 18 occasions by 10 of the 20 participants. Examples include:

'Just talking to other people and, you know, having something to timetable into your diary when the when there wasn't very much going on at all. So that was quite helpful.' – Participant 26, 80 years old

'I think we all need routine within our lives, and you know, the fact that twice a week, we were meeting up sharing different subjects together on own experiences, taking part in the walking challenge, it was just something I look forward to, you know, it was so important participating for my wellbeing.' – Participant 1, 68 years old

'Yours [i.e. the walk and talk course] was good because it was twice a week. I've done other ones that are once a week, so yours was good and I can remember at least one occasion when I really didn't want to log on, but I did, and I felt so much better at the end. So no, and I think twice a week is, that's motivating, it was good.' – Participant 16, 75 years old

The third subtheme was WTL-Z's 'programme design', which enabled and supported participants to exercise and socialise together. This subtheme was coded on 39 occasions by 14 of the 20 participants. Examples include:

'I think Walk and Talk [WTL-Z] is really good, because it kind of encompasses lots of things. It's not just doing some exercises.' – Participant 23, female, 65 years old

'Generally, it's very good and it's worked well and has a nice mixture of exercise, and chat, and socialising as well.' – Participant 23, female, 65 years old

'I think the way the group was organised so that we did have this talk session, it wasn't just fitness, we had this talk session. And that was also given as much weight really, as being part of the whole health thing, really helped.' - Participant 35, female, 68 years old

Theme 2: Empathy and Belonging

Participants reported feeling more empathetic with a sense of belonging, cohesion, and connectedness to one another, due to their involvement with WTL-Z, which led them to supporting one another. This theme was broken into two subthemes. The first subtheme 'cohesion' was coded on 50 occasions by 14 of the 20 participants. Examples include:

'It was belonging to that group and knowing that we were all there to support each other. That that was really, really powerful.' – Participant 31, female, 55 years old

'It was being part of that group, it did give some of that social feedback, some of that connection, sense of connection'. - Participant 35, female, 68 years old

'I know that we have gelled, we did gel didn't we, we really did gel with one another and we're still doing that.' – Participant 20, female, 67 years old

'It's good to understand how people are suffering or what issues people are having. It just makes you more empathetic, I think [in response to meeting new people as part of WTL-Z].' – Participant 24, female, 53 years old

The second subtheme, 'peer support' was coded on 49 occasions by 12 of the 20 participants. Examples include:

'It was nice that other people in the group said, 'oh, this is helpful.' So, I think, it's nice to know that there are other people who can support each other in the group, and that they're relatively nearby, and that they're interested in things like that I'm interested in.' – Participant 19, female, 53 years old

'I still feel even now that if anybody wanted anything, we could reach out on that WhatsApp group.' – Participant 31, female, 55 years old

'It just makes you feel that it's something that you're able to do or it's, it's more within your reach, if a peer can do it.' – Participant 13, female, 54 years old

Theme 3: Empowerment

While participants did not mention the word empowerment specifically, they did mention feeling supported by learning more about health and how they could make sustainable changes to support their health goals. Learning and creating strategies for healthy habit development combined with instructor and peer support led participants to gain confidence which further enabled them develop habits and tactics to improve their health. This theme, therefore, was divided into three subthemes. The first subtheme, 'learning and education,' was mentioned on 35 occasions by 11 of 20 participants. Examples include:

'I think it's sort of put me on a path that's made me more curious now about things where I've been doing more reading and feeling that I really can make a difference. Whereas before I did feel, oh well, you know, it's over the hill now, and it's only gonna, you know, get worse. But now I feel like I can make a difference [referring to her experience with WTL-Z].' – Participant 33, female, 62 years old

'I definitely feel I begun it and I know what I need to do, basically, what I need to do in order to make my health the best they can be.' – Participant 13, female, 54 years old

'I'm much more mindful and I feel like I've got more facts in my head about an understanding about food.' – Participant 27, female, 65 years old

'I like to think I'm learning as well. I think that's a good thing for me, so this is sort of a learning process, it was a fitness process, and it was a mental health process and it was also a dietary process.' – Participant 35, female, 68 years

The second subtheme, 'confidence' was coded on 34 occasions within 10 of the 20 interviews and coded. Examples include:

'I did feel my confidence growing.' – Participant 31, female, 53 years old

'I wasn't really confident about going out or doing anything or meeting people or anything. So, it was really nice to actually start the course then and to meet some new people in relative safety because obviously doing it on Zoom so that was for me, it was kind of like a first step to starting to go back out and it did sort of boost my confidence in terms of getting back out there.' – Participant 13, female, 54 years old

'It's good to see people becoming more confident [referring to other WTL-Z participants].' – Participant 6, female, 62 years old

The third subtheme, 'initiating action' was coded on 50 occasions within 12 of the 20 participants. Examples include:

'I do feel like I've taken ownership of my own health a bit, much more than I did before.' – Participant 33, female, 62 years old

'..supplements, I'm now more regularly taking those, I'm drinking more water and that.. that gives you optimism because if you feel that you're actually an agent in keeping your health up, that's a lot more positive than, you know, the doctor giving you a tablet.' – Participant 35, female, 68 years old

'It's really forced me to just look more within and just create more healthy habits.' – Participant 19, female, 52 years old

'I have eaten a lot more vegetables and eating vegetables that I didn't eat before hardly at all like carrots. I discovered pleasure in carrots.' – Participant 2, male, 71 years old

Cluster 3: Lockdown Experience

This cluster emerged most frequently in response to the question, "How did you get on with lockdown?" Participants responded with a description of their lockdown experience and how it made them feel. This cluster was coded on 78 occasions in 18 of the 20 interviews. There were a variety of lockdown experiences reported with some participants finding the experience more difficult than others. Examples include:

'I didn't find it difficult. I suppose one, I don't live on my own, and two, we've got the dog to walk. Zoom appeared, didn't it, right at the beginning so I've kept in contact with people.' – Participant 6, female, 62 years old

'I felt safe, but there was, you know, there was obviously something niggling at the back of back of my mind.' – Participant 10, female, 55 years old

'My world became limited. Being a bit limited already by mobility, it just closed in even more and I had to try to introduce more distractions to help my mental health.' – Participant 21, female, 63 years old

'I was kind of I was okay, lonely, yeah, but never scared, never. Yeah, because I did as I was told, I went out shopping once a week, because I had no option. Otherwise, I was indoors, so I didn't feel in danger.' – Participant 16, female, 75 years old

'I think my first problems were struggling to create any sense of structure any, any sense of what I could do to deal with the immobilisation of fear that I was experiencing.' – Participant 30, female, 57 years old

Cluster 4: Relationship with Diet and Exercise

Participants relationship with diet and exercise emerged in response the questions, "What led up to you joining WTL-Z?" and "How do you feel about exercising online?" Participants described their attitudes towards exercise classes, gyms, and / or weight management programmes as well as which types of exercise they preferred. This theme was coded on 40 occasions in 14 of the 20 participants. Examples include:

'I used to go to a seated exercise class, which I enjoyed and that was good socially, as well as the exercise.' – Participant 26, female, 80 years old

'I like led exercises, because I personally, if I was to make up my own, I wouldn't know what to do.' – Participant 13, female, 54 years old

'I went a couple or was it two or three times to the gym in the YMCA in Tottenham Court Road and I realised gyms are not for me, the whole atmosphere and machines and things is not my thing anyway.' – Participant 2, male, 71 years old

'I've done the Slimming World thing and the Weight Watchers thing more times than I care to mention and I've never really liked the concept of going somewhere every week and being weighed.' – Participant 23, female, 65 years old

'Having spent years having problems with my weight and having spent so many years switching between Slimming World and Weight Watchers and trying other things. You know, I felt very despondent.' – Participant 33, female, 62 years old

Cluster 5: Socialising Online

This cluster emerged most frequently in response to the questions, "How do you feel about exercising online?" and "How did you get on with lockdown?" Participants were split with some enjoying socialising online, specifically via Zoom, while others insisted on the importance of socialising in-person. This cluster was coded on 55 occasions in 17 of the 20 participants. Examples include:

'Even though we're not physically together, Zoom is brilliant for feeling connected with people. I think it works really well maybe even more so than if you were sitting in a circle in a community hall like I think is what you used to do. I don't know, I think you can connect with people through the screen quite well.' – Participant 24, female, 53 years old

'I can't work out if it would have been harder for me to actually walk into your group in a place in a in a setting or if it was harder, letting you guys into my safe space.' – Participant 31, female, 53 years old

'You can talk to people and do things, but when you're meeting them in the flesh, and you're sort of out in the big wide world, it's more the real thing and I think people can feel a bit more vulnerable.' – Participant 1, female, 68 years old

'On a social front, they're not, they're not the same, you can't have side conversations.' – Participant 10, female, 55 years old

'I think you need the social interaction of actually being with other people when you're doing it. I do anyway, I think it's much better to do it with people than on your own or in front of a screen.' – Participant 26, female, 80 years old

'It's halfway between, you know, watching television or, or something like, you know, yeah, and meeting people in real life, so it's nowhere near as good as meeting people in real life.' – Participant 27, female, 65 years old

STUDY 3: DESIGN AND METHODS

Study 3 provided members of the control group from Study 1 the opportunity to be evaluated and undergo the WTL-Z intervention. Study 1 concluded on 6 April 2021 and Study 3 began on 26 April 2021. Due to this short wash-out period, Study 3 participants mental, social, and physical health data, which was collected at the conclusion of Study 1, was repurposed, and acted as pre-test data for Study 3. Study 3 was a non-controlled quantitative evaluation of WTL-Z.

Hypothesis

The hypothesis of this study was that mental and social would improve significantly in participants following the WTL-Z intervention compared to their baseline assessments. Mid-point assessment of the physical health measures, functional capacity (i.e. lower body strength and balance) would improve significantly, but lifestyle behaviours, such as PA level and fruit and vegetable consumption would not to improve significantly following the WTL-Z intervention compared to their pre-test scores.

Sample

A minimum number of 41 participants were required to evaluate the effects of a paired samples t-test. To determine sample size, a power of 80%, accounting for 10% drop-out, and an effect size of 0.4, was selected and entered into G*Power 3.1 software to remain consistent with the power analysis of Study 1. This effect size was chosen so that it was consistent with Study 1.

Exclusion Criteria

Participants that (a) were not members of the control group during Study 1 and (b) were unavailable or did not want to participate in Study 3, were excluded.

Recruitment

Following the completion of Study 1, control group participants were asked about their preference and availability to participate in Study 3. Those who were wished to participate and were available were recruited to join Study 3.

Protocol

Participants (n=21) were allocated into two subgroups of 10-11 participants, based on their availability. The intervention took place from 26 April - 2 July and each subgroup underwent the WTL-Z intervention as outlined in the intervention protocol of Study 1. Two participants withdrew from Study 3.

Data Collection

As these participants were members of the control group in Study 1, their follow-up data from Study 1 was repurposed and used as their baseline (pre-test) data for Study 3. This was due to the short washout period (i.e. 3-weeks) between the conclusion of Study 1 and the commencement of Study 3. Following the conclusion of Study 3, participants completed a final survey (Appendix 11) and conducted functional fitness assessments (Appendices 5 and 6).

Data Analysis

In this uncontrolled trial, paired samples t-tests were conducted to determine changes in participant's mental, social, and physical health before and after WTL-Z.

STUDY 3: RESULTS
No statistical differences were observed between baseline characteristics of the overall sample in Study 1 and the subsample of Study 3 participants (See Table 6).

Table 6. Baseline demographics, mental, social, and physical health measures of the overall sample of Study 1 (n=78) compared to Study 3 participants (n=19).

Demographics	Study 1 n (%)	Study 3 n (%)	*p*-value
Age (years), mean (SD)	**65.5 (8.1)**	**66.05 (6.4)**	**0.809**
Male gender	**9 (11.5)**	**1 (5.3)**	**0.783**
Caucasian ethnicity	**63 (80.7)**	**17 (89.5)**	**0.283**
Married/common law	**31 (42.5)**	**4 (21.1)**	**0.259**
University degree	**45 (58.4)**	**13 (68.4)**	**0.351**
Annual income >£40k	**11 (18.3)**	**3 (21.4)**	**0.850**
Homeowners	**56 (72.7)**	**13 (72.2)**	**0.517**
Social housing renters	**9 (11.5)**	**1 (5.3)**	**0.783**
Retired	**46 (59.7)**	**9 (47.4)**	**0.488**
Living alone	**38 (48.7)**	**11 (57.9)**	**0.626**
Two or more chronic diseases	**41 (54.7)**	**8 (42.1)**	**0.456**
Five or more medications	**14 (18.7)**	**3 (15.8)**	**0.698**
CEV	**5 (6.7)**	**1 (5.3)**	**0.659**

*Statistical Significance ($p < 0.05$) was calculated using independent samples t-test
CEV, clinically extremely vulnerable

Study 3 participant results are presented alongside their results from Study 1 in order to draw comparisons (see Table 7). As members of the control group during Study 1, statistical significance was observed in these participants' PA level ($p = 0.050$; ES = -0.15) and Sit-to-Stand tests ($p = 0.003$; ES = 0.83). No other

Table 7. Paired samples t-test of variables from Study 1 (i.e. when participants were in the control group) and Study 3 (i.e. when participants completed the WTL-Z intervention).

Measure	Period	Group	n	Pre Mean (SD)	Post Mean (SD)	P-value	ES
Depression	Study 1	Control	19	5.2 (3.1)	5.2 (2.8)	0.946	-0.02
	Study 3	Intervention	19	5.2 (2.8)	3.1 (2.2)	0.002	-0.85
Anxiety	Study 1	Control	19	5.2 (5.0)	4.1 (4.2)	0.214	-0.30
	Study 3	Intervention	19	4.1 (4.2)	2.8 (2.6)	0.074	-0.44
Wellbeing	Study 1	Control	19	21.2 (2.8)	21.3 (2.8)	0.806	0.06
	Study 3	Intervention	19	21.3 (2.8)	22.4 (2.6)	0.036	0.52
Loneliness	Study 1	Control	19	3.2 (2.0)	3.0 (1.8)	0.531	-0.15
	Study 3	Intervention	19	3.0 (1.8)	2.2 (1.3)	0.012	-0.64
PA Level	Study 1	Control	19	39.6 (25.5)	45.3 (26.5)	0.050	0.48
	Study 3	Intervention	19	45.3 (26.5)	43.9 (29.1)	0.802	-0.06
FV Intake	Study 1	Control	19	5.4 (2.5)	5.8 (2.4)	0.309	0.24
	Study 3	Intervention	19	5.8 (2.4)	6.7 (2.3)	0.030	0.54
Sit-to-Stand	Study 1	Control	18	12.8 (2.8)	14.8 (2.8)	0.003	0.83
	Study 3	Intervention	18	14.8 (2.8)	18.6 (5.0)	<.001	1.02
Balance	Study 1	Control	16	30.0 (20.8)	36.7 (30.0)	0.228	0.32
	Study 3	Intervention	16	36.7 (30.0)	69.6 (38.5)	<.001	1.08

statistically significant findings were observed in this subsample during Study 1. In comparison, following their completion of WTL-Z, Study 3 participants improved their depressive symptoms by 41% (p = 0.002; ES = -0.85), wellbeing by 5% (p = 0.036; ES = 0.52), and loneliness by 27% (p = 0.012; ES = -0.64), which were all statistically significant effects (See Table 7). While anxiety was not statistically significant (p = 0.074; ES = -0.44), mean anxiety scores fell by 30% following participants completion of WTL-Z. FV intake (p = 0.030, ES = 0.54) was statistically significant which amounted to participants eating an additional 1.0 servings of fruit and vegetables per day at the conclusion of WTL-Z. Next, 30s Sit-to-Stand (p = <.001; ES = 1.02) and unipedal stance tests (p = <.001; ES = 1.08), improved by an average of 4.2 sit-to-stands and 35.2s respectively, which were both statistically significant findings. Participant's PA level (p = 0.802; ES = -0.06), however, as measured by the Godin-Leisure Score, was non-significant following the conclusion of Study 3. Attendance was 84% and there were no reported injuries. Two participants withdrew from the study. No reason was given for their withdrawal.

Subjective Data and Informal Feedback

Participants answered subjective questions based on a 5-point Likert scale about their balance, strength, body weight, and chronic condition (if applicable). Among participants, 79% believed their balance improved or significantly and none felt it had worsened, 68% felt stronger or significantly stronger while 5% felt weaker and 42% felt they lost weight while 5% felt they gained weight over the intervention period. Of those participants (n=12) who reported having at least one chronic condition, 50% felt their chronic condition improved or significantly improved, while 8% felt their chronic conditioned worsened over the intervention period. 95% of participants felt satisfied or very satisfied with their experience as part of WTL-Z and 5% felt unsatisfied.

Participants were also given the opportunity to provide open-ended feedback about their experience with WTL-Z and 18 of the 19 participants completed this question (see Appendix 7). Several participants mentioned their experience with the online nature of the course resulting in a mix of responses:

> *'Zoom eventually got me down.' – Participant 139, female, 68 years old*

> *'I found it quite tricky to engage with these via Zoom. I much prefer talking to people in person.' – Participant 147, female, age 68 years old*

> *'I found it very interesting to listen to the other participants even though I found Zoom a bit frustrating.' – Participant 144, female, 64 years old*

> *'I think zoom brought us together.' – Participant 148, female, 58 years old*

> *'Being part of the zoom group was excellent for a social connection as, since having a stroke, I do not go out for social activities.' – Participant 156, female, 65 years old*

> *'A big plus was that it was free & less intimidating online than being in a room of people.' – Participant 165, female, 57 years old*

Many participants also mentioned that WTL-Z helped them make healthy changes to their lifestyle. For example:

> *'The course has motivated me to make changes to my lifestyle, small changes, but I feel these have made a difference to my outlook on health and wellbeing.' – Participant 156, female, 65 years old*

> *'It made me think about self-care and taking a staggered approach to improve my habits.' – Participant 136, female, 56 years old*

'This has made the group even more significant, as the support to develop tiny habits and mindfulness will support me during my journey towards treatment.' – Participant 148, female, 58 years old

Section 4
Discussion and Integration

This section uses an integrated approach to combine findings from Studies 1, 2, and 3 in order to answer this trial's two research questions. While this trial consisted of three studies, the quantitative findings of Study 1 and qualitative explanation of Study 2 has been prioritised within this section. This is due to greater statistical power which Study 1 provides and the explanation of Study 2, which involved participants from Study 1. Where data is not sufficient or the explanation of a finding is incomplete, results from Study 3 is referenced and discussed. Clusters from Study 2, to include 'lockdown experience', 'relationship with diet and exercise,' and 'socialising online,' were not discussed in this section as these clusters were unrelated to the research questions and did not provide further explanation of the quantitative findings of Study 1.

Feasibility and Acceptability of WTL-Z

WTL-Z was a feasible and acceptable intervention for London-based older adults impacted by COVID-19 social distancing restrictions adding to the preliminary efficacy observed by Bender and Myrissa (2020) in their implementation of WTL-Z. Older adults who were responsive to email and subsequently randomised into Study 1, were capable of accessing and navigating the required technology (i.e. a computer, tablet, or smart phone with a front facing camera), email, and video conference software (i.e. Zoom) to participate in the WTL-Z intervention. This result, however, is subject to sampling bias due to the internet-based recruitment strategy and online nature of the programme, which inherently limited access to the programme for those older adults who did not possess the required technology, software, and skills to participate. While older adults are more likely to experience digital exclusion than younger age groups, Haase et al. (2021) reported that 89.5% of older adults (average age 72 years) were aware and capable of how to use technology to connect with others and socialise. In the UK, internet use has risen in older age groups from 52% in 2011 to 83% in 2019 and following the outbreak of COVID-19, internet use, in this demographic, likely accelerated (ONS, 2019). For example, from February to May 2020, the use of video-calling surged to record levels (+177%) in UK adults aged 65 or older (Ofcom, 2020). Therefore, while this study is subject to sampling bias, internet use is accelerating in older age groups and the assumed technological barriers present in WTL-Z may be easily overcome by UK older adults. While technical difficulties (i.e. low internet bandwidth, dropped calls) were experienced by both the instructor and participants throughout the intervention, these interruptions were sporadic and did not detract from the delivery of the intervention. Only one participant who completed the WTL-Z intervention required consistent technological assistance from the researcher and no Study 2 participant mentioned technical difficulties or IT related barriers during their experience with WTL-Z. Of all participants who completed the WTL-Z intervention during this trial (n=54) 98% reported that they felt satisfied or very satisfied about their participation. The combined attendance rate of Study 1 and Study 3 participants was 84%, which further supports the feasibility and acceptability of WTL-Z.

Demographics

While WTL-Z was initially successful at recruiting a diverse sample (65% Caucasian), which was representative of London-based older adults (which ranges between 61-73% Caucasian) ethnic minority participants were more likely to withdraw from the study prior to randomisation (i.e. unresponsive to email) and more likely to withdraw from Study 1 following randomisation than Caucasian participants (Greater London Association, 2018). These factors led to the final sample of Study 1, to be far less ethnically diverse (81% Caucasian) than the original sample. Furthermore, Caucasian participants were more likely to be available and agree to take part in Studies 2 and 3, which led to less diverse samples in these later studies. Time constraints, interest, and technological difficulties were reasons why some minority participants withdrew from Study 1, however, 90% of participants who withdrew, including those who were Caucasian, became unresponsive to email and were subsequently withdrawn from participation in the study.

Determining socioeconomic status in older adults can be problematic due to retirement and the relationship between employment and income (Stronks et al., 1997). Homeownership, therefore, has be used as an additional measure to estimate socioeconomic status in this population (Martikainen et al., 2008). Secondly, in the UK, people of lower incomes can apply for and rent affordable accommodation owned by the state, termed social housing. Therefore, individuals who report renting from social housing can be another way socioeconomic status can be determined in UK older adults. While WTL-Z was initially successful at recruiting a representative sample of participants who rented from social housing (16%), these participants were more likely to withdrawal from study 1 before randomisation. Furthermore, control group participants in Study 1 who rented from social housing were less likely to be available or agree to participate in Study 3. The higher withdrawal rates in ethnic minorities and those renting from social housing is problematic as it may contribute to the growing rates of health inequalities between race and class in the UK.

Next, this study failed to recruit a gender balanced sample (12% male), although this imbalance was expected. For example, Bender et al. (2019) recruited a sample which was 8% male and the sample from Bender and Myrissa (2020) was 17% male. Other UK-based lifestyle interventions, such as Mountain et al. (2017) and Orton et al. (2021) which were well funded studies, recruited a sample of 31.9% and 27% male, respectively. Due to the expectation that more females would sign up for WTL-Z, additional online advertisements and funding were directed toward recruiting men into this trial. WTL-Z, however, was marketed as a holistic, group-exercise, and socialising course. Patzelt et al. (2016) in their qualitative study of German older adults, reported that men favoured exercise interventions which were competitive, whereas women preferred interventions that were holistic and socially oriented in nature. Therefore, due to the social nature of WTL-Z, other styles of group exercise may be needed to target male older adults.

Comparisons of Baseline Mental, Social, and Physical Health to National Averages

The prevalence of moderate to severe depressive symptoms in this study (27.8%) is substantially higher than the national averages of adults aged between 40-69 (18.0%) and those over 70 (10.0%) (ONS, 2021). The ONS collected their data over a similar time (January and March 2021) compared to this study (December 2020 – January 2021) which is important as depressive symptoms peaked in UK older adults between December 2020 - March 2021. Furthermore, the ONS (2020a) used the eight-item Patient Health Questionnaire depression scale (PHQ-8) whereas this study utilised the PHQ-9, which along sample size and sample bias may explain the disparity observed in the prevalence of depressive symptoms between this study and the ONS data (Kroenke et al., 2008). Data from the English Longitudinal Study on Ageing (ELSA), which was sampled between November-December 2020, however, was much more consistent with this study with a prevalence of moderate to severe depressive symptoms in 28.5% of their cohort of adults aged 52 and older (Zaninotto et al., 2021). The 8-item Centre for Epidemiological Studies Depression (CESD-8) Scale, however, was utilised by Zaninotto et al. (2021), which makes a true comparison difficult as depression scales have varying degrees of sensitivity (Van de Velde, Levecque, and Bracke, 2009) (Williams et al., 2012). Other reasons for the high prevalence of moderate to severe depressive symptoms observed are likely due to this sample being disproportionally represented by older women (89% of the sample) who are more likely to report higher levels of depression than men and this study's recruitment strategy, which included networking with mental health organisations such as Mind and referrals from social prescribers (ONS, 2020a).

Levels of moderate to severe anxiety were reported in 19.8% of this sample, which is nearly twice as great as the prevalence reported in the ELSA cohort (10.9%), which measured anxiety with the GAD-7, the same instrument used within this trial (Zaninotto et al., 2021). Along with recruitment strategy and sample bias, the higher rate of anxiety in this sample is likely due to gender differences as women (disproportionally represented in this sample) are twice as likely to be diagnosed with an anxiety disorder compared to men (Martín-Merino et al., 2010). Gender differences also likely contributed to the prevalence of low wellbeing which was more prevalent (32%) compared to high wellbeing (6%) in this sample (n=149). The mean wellbeing score (20.85) was also substantially lower in this sample compared to national norms (24.11) of UK older adults (55+) between 2010-2013 (Ng Fat et al., 2017). This difference might suggest that COVID-19 has contributed to the lower wellbeing scores observed in this sample compared to pre-pandemic national averages.

Regarding social health, the prevalence of loneliness (70.3%) in this sample (n=155) is nearly ten times greater than the UK national average (7.2%) (n=5,260) (ONS, 2020b). The ONS, however, measured loneliness directly by asking participants, 'How often do you feel lonely?' with five response options (Often/Always, Some of the time, Occasionally, Hardly ever, or Never) and with a 10-point Likert scale that asks participants 'On a scale where 0 is not at all lonely and 10 is extremely lonely, how lonely do you feel in your daily life?' Due to the stigma surrounding loneliness, participants are likely to underreport their levels of loneliness on questionnaires include the word 'lonely' (Valtorta et al., 2016) (Goodman et al., 2015). When compared to previous iterations of WTL and WTL-Z studies and which sampled London-based older adults, the prevalence of loneliness is comparable at 62.5% in the sample (n=114) from Bender et al. (2019) and 71.4% in the sample (n=35) from Bender and Myrissa (2020). These studies used the 6-Item de Jong Gierveld Scale (DJG-LS), which is likely a more sensitive instrument as it does not include the word 'lonely' or 'loneliness' within its 6 questions (Valtorta et al., 2016). The use of different loneliness scales, sample sizes, locations (national vs. regional), and sample bias (i.e. lonely people joining an intervention designed to improve social health) likely explain the disparity in loneliness prevalence observed in this study compared to the national average. Regardless, the prevalence of loneliness in this study and previous iterations of WTL and WTL-Z is alarming and highlights the potential that loneliness in UK older adults is grossly underestimated in national assessments.

When comparing physical health measures, physical inactivity levels in this study's sample (n=138) was 32%, which is representative of physical inactivity levels compared to the national average. For example, between March to May 2020, 32% of older adults (65+) were inactive (i.e. no physical activity or less than 30 minutes of moderate physical activity per week) (Mahmood, Ashton, and Jaccard, 2021). It was expected that inactivity levels in this sample would be higher compared to Mahmood, Ashton, and Jaccard (2021) as inactivity levels reached their peak in UK adults between December 2020 – January 2021, when this study's sample data was collected. Furthermore, because women are slightly less active compared to men the similar rates of inactivity in this sample compared to the national average is somewhat surprising due to this sample's gender imbalance (Sport England, 2021). Average fruit and vegetable consumption per day in this sample (n=151) was 5.4 servings (5.5 servings for women and 4.3 servings for men), far above the national average for UK adults, which has remained stable at 3.7 portions per day over the past decade (Health Survey for England, 2020). This disparity is likely due to age and gender differences as older women are more likely to report higher intake fruit and vegetable servings per day compared to men or younger women (Nicklett and Kadell, 2013) (Lallukka et al., 2007). Lower body strength, measured by the 30s Sit-to-Stand Test, was below average in 39.3% of participants (14.8% were above average), which suggests that falls risk, in this sample, was unusually high (Rikli and Jones, 1999). The pandemic likely contributed to the elevated falls risk observed within this sample as average duration of strength and balance activity decreased from 126 minutes in 2019 to 77 minutes per week by May 2020 (Mahmood, Ashton, and Jaccard, 2021).

Evaluation of WTL-Z on Mental Health

In Study 1, intervention group participants on average reported worse mental health compared to control group participants. While these differences at baseline were non-significant it meant that intervention group participants had to improve far greater compared to the control group to demonstrate a statistically significant difference at post-test. Non-significant differences between groups at baseline is common in RCTs and is often addressed with the use of the ANCOVA, a parametric statistical analysis. Across every variable, however, the data was non-parametrically distributed and, therefore, failed to meet the parametric assumptions required to run ANCOVA. Therefore, the Mann-Whitney U test, a non-parametric analysis, was conducted. Unsurprisingly, as Mann-Whitney only measures the difference between groups at post-test and does not account for differences between groups at baseline, the results reported in mental health related variables were not significant. However, depressive symptoms (-30%), anxiety (-37%), and wellbeing (9%) each improved in intervention group participants compared to their baseline. In comparison, control group participants also reported improvements in their depressive symptoms (-13%), anxiety (-15%), and welling (2%) compared to their baseline. However, these findings can be misleading due to the statistical phenomenon known as regression to the mean (RTM), which can make natural variation in repeated data look like real change (Barnett, van der Pols, and Dobson, 2005). Simply put, the baseline mental health variables were much farther below the mean in intervention group participants compared to control group members, meaning that intervention group participants were more likely to improve during the repeated test

compared to control group participants. Therefore, while intervention group participants improved their mental health scores compared to their baseline following their participation in WTL-Z, this improvement may have been due to RTM and not due to WTL-Z. Due to the inability to control for baseline differences between groups and the statistical phenomenon of RTM, quantitative conclusions about the mental health benefits of WTL-Z are limited within Study 1.

Qualitative analysis from Study 2, however, revealed that participation in WTL-Z was beneficial for many participants' mental health. Individual variables and terms such as depression, anxiety, or wellbeing, however, were rarely mentioned by participants, which made comparisons to the quantitative data of Study 1 more challenging. Instead, generic terms were utilised. For example:

> *'The course was really one of the things that helped me to kind of get out of that little hole that I was in.' - Participant 13, female, 54 years old*

> *'Before I joined the walk and talk, I think I was on a downward spiral to be honest, not that I noticed it as much as I now realise.' - Participant 35, female, 68 years old*

> *'I think that this, this course has helped with my mood.' - Participant 28, female, 81 years old*

> *'It gave me that confidence to start the dog walking business, which has had a massive impact on me and my mental health.' – Participant 31, female, 53 years old*

The use of generic terms to describe mental health may have been due to the stigma that exists surrounding mental health disorders, particularly among older adults (Tzouvara et al., 2017). Regardless, the use of generic terms to describe mental health, makes explanations of Study 1 results more challenging to evaluate.

Within Study 3, the largest effect size observed within the mental health variables was of depressive symptoms, which reduced by 41% ($p = 0.002$; ES = -0.85). This improvement is in depressive symptoms is similar to the results from Dunn et al. (2005) in their study on the dose response of exercise to treat depression. Dunn et al. (2005) reported that following 12 weeks of moderate to vigorous aerobic exercise for 30-45 minutes, three times per week, depressive symptoms reduced by 47% from baseline. This amounted to a total dose of 1,080-1620 minutes of moderate to vigorous exercise over the course of their 12-week intervention (Dunn et al., 2005). In comparison, the total dose of exercise that WTL-Z participants received, was 600 - 900 minutes of moderate to vigorous exercise, far less than that conducted by Dunn et al. (2005). What is more surprising, however, was that WTL-Z was conducted online, yet was capable to record a similar dose response to treat depression as an intervention that was completed in-person. Bender and Myrissa (2020) in their pilot study of WTL-Z, reported a similar effect with depressive symptoms, which improved by 35% ($p = 0.001$; ES = -0.63) in their cohort, compared to baseline.

Wellbeing was also statistically significant in Study 3 participants ($p=0.036$; ES 0.52). This is comparable to other physical activity-based interventions for older adults, which were conducted in-person (Ehlers et al., 2018). Lastly, while anxiety was not statistically significant ($p=0.074$; ES -0.44) mean anxiety scores of Study 3 participants improved by 30%. In-person physical activity-based interventions are well known to improve anxiety related symptoms and the non-significant result observed in Study 3 may have been due to a small sample size (Kazeminia, et al., 2020).

Evaluation of WTL-Z on Social Health

Unfortunately, following randomisation, baseline measures of loneliness between Study 1 control and intervention groups were statistically significantly different ($p=0.005$). Therefore, a quantitative evaluation of WTL-Z on loneliness is limited within Study 1. Qualitative analysis from Study 2, however, revealed that participants felt that WTL-Z helped them develop a sense of connection. For example:

> *'I think the, the lockdown, and, you know, has, has caused so many people, including me, frankly, to, you know, to feel to feel lonely. I do feel dreadfully alone, alone and lonely and so being able to meet*

all of you guys, you know, twice a week, helped with that connection. It really did help with the connection.' – Participant 3, female, 74 years old

'I don't think I know the people as well in my Pilates class or have felt that connection with people in my Pilates class and I've been going there for about 10 years, as I did with the people, I miss the people, in the Walk and Talk group.' - Participant 35, female, 68 years old

'It was being part of that group, it did give some of that social feedback, some of that connection, sense of connection.' - Participant 35, female, 68 years old

Participant 31 also mentioned how much she enjoyed the company of her WTL-Z group:

'I didn't even think I realised I was lonely. I don't think I even knew that, because I was more about being safe in my house, then that was my sort of red flag, I need to be safe in my house. So, I don't think I realised how much I liked other people's company til that company in that group.' – Participant 31, female, 53 years old

Other social health benefits were also reported by participants following their involvement with WTL-Z. For example:

'I've now got a bunch of friends, I consider them [other WTL-Z participants] friends, although I haven't met them yet [in the flesh].' – Participant 24, female, 53 years old

'It was just good to meet a group of like-minded women at similar stages in their lives who were maybe 10 years ahead of me and just reflecting on their experiences. I felt that I could gain a lot from their wisdom.' – Participant 19, female, 53 years old

These qualitative findings are similar to those reported by Hwang et al. (2018) in their qualitative analysis of the Canadian version of WTL. Their participants voiced their perceptions about how involvement in WTL had a positive impact upon their own and other participants' feelings of loneliness and increased their sense of belonging. For example, a WTL participant reported by Hwang et al. (2018) said:

'...gradually I'm very confident to come every Monday and Thurs- day and make me more easy to cope with that new environment, because very quiet here. It's totally different from Vancouver.... This is like a small community. So I come here to make me happy... . and give me more 'I'm here' 'I belong here.''

Quantitative analysis from Study 3 also highlighted that participation in WTL-Z could be beneficial to improve social health by reducing feelings of loneliness. For example,
between January to April 2021, as members of the control group, Study 3 participants loneliness scores reduced by 6%, which was a non-significant result (p = 0.5321; ES -0.15). By July 2021, after completing the WTL-Z intervention, however, Study 3 participants loneliness scores reduced by an additional 27% (p = 0.012; ES = -0.64) which was a statistically significant result. This reduction in loneliness was similar to the results from Ollonqvist et al. (2008), in their cohort of older adults, who reported similar loneliness levels at baseline compared to this study. Furthermore, Bender and Myrissa (2020) in their WTL-Z intervention, reported similar results, with participants reducing their feelings of loneliness by 25% (p = 0.012; ES = -0.71). While quantitative results from Study 1 were inconclusive due to statistical differences at baseline, qualitative results from Study 2 and quantitative results from Study 3 suggest WTL-Z may be an effective treatment to reduce feelings of loneliness.

Evaluation of WTL-Z on Physical Health

At baseline, PA level was nearly identical between groups and was also the only variable to show a statistically significantly difference ($U = 479.00$, $z = -2.054$, $p = 0.040$) between groups at post-test during Study 1. Compared to a meta-analysis by Chase (2015), this improvement in PA level is consistent with other physical activity interventions that include behaviour change in their design. The increase in PA level

observed in Study 1 participants may have been due to the virtual walking challenges which began during week 2 of the WTL-Z intervention. Participant 10, for example, referring to the goal she set for her daily step count during the virtual walking challenge, reported:

> *I'm still doing the 10,000 steps – Participant 10, female, 55 years old*

Participant 31 also mentioned how the virtual walking challenge she completed during WTL-Z encouraged her to look for a second walking challenge following the conclusion of the course:

> *I signed up for the June challenge for cancer research and it was a 60 mile.. 60 miles in June or something and I've done 60 miles in the first week. So that's how it works, without that other walking challenge, I wouldn't have thought to look for another challenge. – Participant 31, female, 53 years old*

No improvement, however, was observed in PA level in Study 3 ($p = 0.802$; ES = -0.06). Between January to April 2021, however, Study 3 participants, as members of the control group during Study 1, reported a statistically significant improvement in their PA level ($p = 0.05$; ES = 0.48). As Study 3 participants were already highly active improvement in this variable may have been more challenging to accomplish. Regardless, the improvements observed in participants during between January to April had been largely maintained at the conclusion of Study 3. In comparison, Bender and Myrissa (2020), reported an improvement in PA level in their participants, however, the result was non-significant ($p = 0.102$; ES = 0.44).

While FV intake ($U = 633.5$, $z = -0.351$, $p = 0.725$) was non-significant between groups in Study 1, intervention group participants did report eating an additional 1.2 servings of fruits and vegetables per day. Qualitative analysis from Study 2 supported this improvement from participants baseline FV intake. For example, Participant 2, mentioned his increase in vegetable intake following his participation in WTL-Z:

> *'I started to be better at preparing meals or healthy meals and that's quite important and the course has helped on that.' - Participant 2, male, 71 years old*
>
> *'I'm sure talking about nutrition has been very important and now I have eaten a lot more vegetables and eating vegetables that I didn't eat before hardly at all like carrots. I discovered pleasure in carrots. Buying the Morrison's organic carrots for example.. and so I I look for health, I look for organic things, especially what you can get at Lidl or at other places. So I think more vegetables with a salad you know with different coloured things and peppers and cut them up in and spring onions you know things that I didn't do before.' - Participant 2, male, 71 years old*

And Participant 33 also mentioned the role of WTL-Z to improve her physical health:

> *'Physically, I feel much better, I'm eating better.' – Participant 33, female, 62 years old*

Bender and Myrissa (2020) reported minimal change in vegetable intake in their participants following the conclusion of their WTL-Z intervention. Awareness, however, surrounding the importance of vegetable consumption may have improved in their participants, which was reported in written feedback following participants completion of the WTL-Z intervention. For example, a female participant aged 70 mentioned:

> *'The course has made me reflect on how much [sic] vegetables I use in one day... and has brought to my attention that I need to eat more veg.'*

Neville et al. (2015), in their 16-week fruit and vegetable intervention, found that older adults who completed their programme increased their FV intake by 2.0 servings per day, which was statistically significant ($p < 0.01$). The cohort from Neville et al (2015), however, at baseline consumed only 2.0 servings of fruit and vegetables per day, which likely contributed to the significant effect observed in their study. In

comparison, Study 1 participants baseline FV intake was 5.2 servings per day and increased to 6.4 servings per day at the conclusion of WTL-Z. This level of improvement, however resulted in a non-significant when compared to the control group which increased their FV intake by 0.5 servings per day.

Lower body strength, as measured by the 30s Sit-to-Stand Test improved in both intervention and control group participants of Study 1. While the intervention group added an additional 3.3 sit-to-stands compared to the control group who added 1.9 sit-to-stands at post-test this difference between groups was non-significant *(U* = 376.5, *z* = -0.381, *p* = 0.703). This result is likely influenced by the difference between groups at baseline as the control group on average recorded a greater number of sit-to-stands at baseline. Regardless, qualitative analysis of Study 2 reported that many participants felt that their strength improved due to their involvement with WTL-Z. For example,

> *'I certainly built up some muscles, which were much needed in my legs and things.' - Participant 35, female, 68 years old*

> *'that has made me feel much stronger, and more capable of doing things that I should be doing.'*
> *– Participant 28, female, 81 years old*

Furthermore, Study 3 participants improved their lower body strength significantly (p < 0.001; ES = 1.02) as measured by the 30s Sit-to-Stand test. This amounted to an additional 4.2 sit-to-stands following their completion of WTL-Z. This result surpasses the improvement observed in lower body strength by Bender, Jones, and Elliott (2019) in their evaluation of WTL-UK, which reported an additional 2.4 Sit-to-stands (p = 0.005; ES = 0.65) in their cohort of east-London based older adults. This difference, however, may have been attributed due to the challenges of conducting functional fitness tests online, where a variety of additional variables were difficult to control for, such as chair height. Regardless, the large effect size observed in lower body strength within Study 3 participants is surprising as only bodyweight and house-hold items, such as books, were utilised to overload the body compared to the evaluation of WTL-UK which utilised medicine balls and kettlebells (Bender, Jones, and Elliott, 2019).

Balance, as measured by the unipedal stance test, also improved in both intervention and control group participants of Study 1. While balance improved by an average of 21.8s in the intervention group compared to an improvement of 8.0s by control group participants in their unipedal stance test, this result was not statistically significant *(U* = 236.0, *z* = -1.430, *p* = 0.153). However, qualitative analysis from Study 2 revealed that many participants felt their balance had improved as a result of their involvement with WTL-Z. For example:

> *'My balance has got better.' – Participant 28, female, 81 years old*

> *'I would say, my balance has got better, I mean, I do, I've, I've felt stronger in that respect. And actually, the little, little tips of, you know, standing on one leg and waiting for the kettle to boil. And, you know, that's, that's all been great. And, I mean, balance was a was a problem for me.'*
> *– Participant 3, female, 74 years old*

Study 3 participants improved their unipedal stance test by 84% (35.2s), which was statistically significant (p<0.001; ES 1.08). This result is comparable Gonzalez et al. (2013) in their study on the effects of a twice weekly, 6-week resistance training intervention designed to improve unipedal stance test in their cohort (n=23) of older adults aged 60 years and older. Gonzalez et al. (2013) reported that average unipedal stance test increased by 42.1% (21.0s), which they claimed was likely due to their 6-week resistance training intervention. Furthermore, the protocol and baseline scores of participants from Gonzalez et al. (2013) were similar, which further enhances an accurate comparison between these studies.

Composite Score Evaluation of WTL-Z

A composite score, which controlled for differences between groups at baseline was created to provide a quantitative overall evaluation of WTL-Z during Study 1. This analysis revealed that WTL-Z intervention group participants composite mental, social, and physical health improved significantly compared to the

control group ($F = 8.940$, $p = 0.004$, $\eta^2 = 0.12$). Qualitative analysis from Study 2 corroborated this quantitative finding and participants often reported feeling better, however, without specifying as to which health domain they attributed this feeling to following their participation in WTL-Z. Furthermore, many participants credited their overall health improvement to their involvement with WTL-Z. For example:

> *'I think that if somebody would have told me at the beginning of the [WTL-Z] programme, the impact it would have had on me, I wasn't expecting that, I'll be honest, I wasn't expecting.. I wasn't expecting to actually change the way I do my life and it has. – Participant 31, female, 53 years*

> *'I feel a lot more positive about things that I can do. And I can get out and about and feel a lot less old, which is stupid, because you haven't changed my age, but I was feeling an old lady.' – Participant 35, female, 68 years*

> *'And physically, I feel much better, I'm eating better. And so I think that all impacts on your sort of mental health as well. So, sort of genuinely all round, much more positive, I think.' – Participant 33, female, 62 years*

> *So I'm feeling the physical... mental fitness is quite important and particularly the physical thing has come out of this course that's supporting me now and helping me to feel fit – Participant 2, male, 71 years*

Unfortunately, the use of this type of composite score is unique to this study, which limits comparison of this study's quantitative findings to other lifestyle interventions.

Reasons for Health Improvement

The results of the composite score evaluation and corroborating qualitative analysis from Cluster 1, begin to answer this trials' second research question, suggesting that the health improvement observed within intervention participants was due, at least in part, to their involvement in WTL-Z. The qualitative analysis within Cluster 2 provides a more detailed inquiry into what factors within WTL-Z led to these health improvements (see Figure 3). Firstly, participants mentioned how the instructor's influence, his personality, skills, and welcoming attitude were necessary to facilitate and manage the course appropriately. For example:

> *'I mean, obviously, I think the success of it, in a lot of ways, did depend on the personality and the skills of the person that was leading it (referring to the WTL-Z instructor)' – Participant 35, female, 68 years old*

This finding is supported by Pels and Kleinert (2016), in their systematic review on loneliness and physical activity, who suggested the effectiveness of social group exercise interventions to reduce loneliness was largely dependent on the skills of the instructor to build quality relationships with and between participants. The WTL-Z programme, however, is designed to create a welcoming social atmosphere. For example, within the WTL-Z manual, the instructor is tasked with the responsibility of creating a non-judgemental space in which participants feel welcomed and comfortable to share to with one another to build connection and group cohesion. Furthermore, the design of WTL-Z includes physical activity, which is well known to improve aspects of mental and physical health (Blumenthal et al., 1999; Lim et al., 2021). Therefore, the programme design of WTL-Z provides a second reason for the observed health improvements. Simply by facilitating an intervention twice per week, however, provided participants with a routine and structure that they also valued. For example:

> *'I think we all need routine within our lives, and you know, the fact that twice a week, we were meeting up sharing different subjects together on own experiences, taking part in the walking challenge, it was just something I look forward to, you know, it was so important participating for my wellbeing.' – Participant 1, female, 68 years old*

Ludwig (1997) in her qualitative study, found that having a routine is beneficial to the wellbeing of older adults, particularly women. Therefore, the routine and structure that WTL-Z provided participants is a third reason for the improvement in health observed in Study 1. Due to instructor's facilitation of WTL-Z and the programme design of WTL-Z. Next, WTL-Z provided the space for participants to empathise with one another, support one another, and develop a sense of belonging. For example:

> *'It was belonging to that group and knowing that we were all there to support each other. That that was really, really powerful.' – Participant 31, female, 55 years old*

> *'It was nice that other people in the group said, 'oh, this is helpful.' So, I think, it's nice to know that there are other people who can support each other in the group, and that they're relatively nearby, and that they're interested in things like that I'm interested in.' – Participant 19, female, 53 years old*

Participants not only felt they received support from others, which is important for functioning in daily life (Lakey & Orehek, 2011), but that they also provided support, which can be rewarding, stress reducing, and beneficial to the mental health of the individual giving the support (Inagaki and Orehek, 2017). Furthermore, improving sense of belonging has been linked to numerous psychosocial benefits to include a reduction in depressive symptoms (Hagerty et al., 1992; Cheonarom et al., 2005). Therefore, giving and receiving support and increased feelings of belonging may be an additional two factors which contributed to the health benefits observed in participants within Study 1.

Participants also mentioned the learning and education benefits they received from WTL-Z. For example:

> *'I like to think I'm learning as well. I think that's a good thing for me, so this is sort of a learning process, it was a fitness process, and it was a mental health process, and it was also a dietary process.' – Participant 35, female, 68 years*

While cautioning against over generalisation, Field (2009) acknowledged the direct and positive health benefits that adult learning can have on wellbeing. Furthermore, Aked et al., (2011) writing for the New Economics Foundation included 'learning new skills' in their article 'five ways to wellbeing,' due to the mental health benefits associated with adult learning. Possibly due to the increased feelings of support, belonging, and sense of learning, participants reported feeling more confident. For example:

> *'I did feel my confidence growing.' – Participant 31, female, 53 years old*

> *'The confidence that I got from it [WTL-Z], like I said it, it had massive impact on me.' – Participant 31, female, 55 years old*

> *'But it's good to see people becoming more confident.' – Participant 8, female, 62 years old,*

Increased confidence or self-worth may be another potential mechanism to explain the health benefit observed in Study 1. For example, feelings of worthlessness are associated with both depression and loneliness and improvements in confidence may translate to improved mental and social health (Müller-Spahn and Hock, 1994; Abeyta et al., 2020). This increased confidence was likely influenced by the exercise component of WTL-Z. For example, Gothe, et al. (2011) in their physical activity intervention for older adults, found that after 12 months of strength training participants increased their physical strength and their self-esteem.

Lastly, participants mentioned how they felt they could now make a difference and take ownership of their health. For example:

> *'I do feel like I've taken ownership of my own health a bit, much more than I did before.'*
> *– Participant 33, female, 62 years old*

'..supplements, I'm now more regularly taking those, I'm drinking more water and that.. that gives you optimism because if you feel that you're actually an agent in keeping your health up, that's a lot more positive than, you know, the doctor giving you a tablet.' – Participant 35, female, 62 years old

People who feel that they have agency in their health are more likely to take action to change their lifestyle in a positive way, which can result in better health outcomes (McAllister et al., 2012; Lambrinour, Hansen and Beulens, 2019). Furthermore, a high sense of control is related to better health behaviours, higher psychological well-being, lower psychological distress, decreased loneliness, and increased contact with friends (Hong et al., 2021). Empowering patients to take responsibility for their health, therefore, likely enhances health agency and results in improved health status (McAllister et al., 2012). Participants also reported that they had begun to take actionable steps to improve their health:

'It's really forced me to just look more within and just create more healthy habits.' – Participant 19, female, 52 years old

Strengths

To the author's knowledge, this is the first fully powered trial to test the preliminary efficacy of an online social group exercise intervention to improve symptoms of anxiety and depression, loneliness, and functional fitness. This trial's primary strength was its use of the WTL protocol which has shown consistent efficacy in both Canada and the UK to improve both loneliness and depressive symptoms in older adults. Furthermore, the pilot study conducted by Bender and Myrissa (2020) provided additional evidence that WTL-Z could effectively be conducted online and alleviate symptoms of depression and loneliness. The inclusion of functional fitness assessments not only allowed for a physical evaluation of WTL-Z, but also helped build rapport with participants and work through technological difficulties with Zoom prior to randomisation. Next, the use of a control group was of particular importance in Study 1, which took place between January – April 2021. This time period coincided with the gradual easing of social distancing restrictions and the roll-out of the coronavirus vaccines to older adults in the UK. Therefore, Study 1 was able to control for the health improvements that may have resulted due to the ending of lockdown and participants receiving their coronavirus vaccine. Lastly, the use of a mixed-methods explanatory design not only corroborated the quantitative data of Study 1 and Study 3, but also provided insight into the factors which may have contributed to the health improvements observed.

Limitations

Firstly, to ensure adequate recruitment goals were reached, participants were not required to complete their initial survey in its entirety. For example, participants could skip questions about their income, marital status, and PA level. Therefore, this trial contains missing data, which can reduce the power and efficiency of a study and potentially contribute to biased results (Bell and Fairclough, 2005; Carpenter and Kenward, 2007). The trial failed to recruit a gender balanced and ethnically diverse sample, which limits the generalisability of this trial's outcomes. Thirdly, WTL-Z is only accessible to older adults who possess the required technology and skills to participate, which may exacerbate the 'digital divide' that exists among older adults particularly those of lower socioeconomic status (Berry, 2011). The use of a non-standardised composite score in Study 1 is another limitation of this trial, which, due to missing data, is subject to bias. As the functional fitness assessments were conducted online, assessments were occasionally observed and scored with an obstructed view, which reduces the reliability of the results. The researcher had extensive experience managing social group exercise classes, which may limit the reproducibility of WTL-Z interventions led by other personal trainers or health professionals. Furthermore, independent researchers were not utilised to evaluate the quantitative or qualitative data of this trial. Lastly, the researcher is the director of a social enterprise which utilises the WTL-Z protocol which also may bias the results.

Conclusion and Recommendations

Implementation of WTL-Z proved to be feasible and acceptable to participants. Furthermore, WTL-Z may be an effective intervention to improve certain aspects of mental, social, and physical health in older adults. The varying degree of health improvements observed in WTL-Z participants may be due, in part, to seven potential mechanisms: 1) the therapeutic effects of exercise, 2) the benefits of routine and structure, 3) the

positive outcomes associated with learning new skills, 4) increased feelings of social support, 5) greater sense of belonging, 6) increased self-worth, and 7) greater sense of agency over their health.

A larger randomised controlled trial is needed to confirm the mental, social, and physical health effects of WTL-Z in older adults. The inclusion of additional health professionals, who are trained in the WTL-Z protocol, should be utilised to demonstrate reproducibility and scalability of WTL-Z. Next, data collection and analysis should be conducted by independent researchers, who are not associated with Walk + Talk CIC. A cost-utility analysis using instruments such as the 5-dimendsion EuroQol (EQ-5D) should be included in future research to assess the cost-effectiveness of WTL-Z (Rabin and de Charro, 2001). Next, follow-up studies are needed to determine the long-term effects of WTL-Z. Lastly, to increase participant diversity and generalisability of WTL-Z, future trials should include specific strategies to attract men and minority groups.

Section 5
Growth and Business Plan

Walk + Talk CIC has a membership base of over 40 older adults who pay a subscription fee of 18.99 GBP per month to participate in weekly online classes. In-person classes were reintroduced in August 2021 and take place once weekly at an East London community centre. In-person classes attract an additional 10-20 unique participants who prefer to only participate in-person compared to online and these classes cost 20.99 GBP. Participants who attend online and in-person classes pay a monthly subscription fee of 28.99 GBP.

In the months and years ahead, Walk + Talk CIC plans to grow their monthly membership base to over 100 older adults becoming a sustainable social enterprise. Further growth and expansion of Walk + Talk CIC, however, will require investment from the public or charitable sector to train and incentivise other personal trainers and health coaches to operate Walk + Talk franchises in their local areas. A larger academic study is then planned and will train new Walk + Talk instructors to confirm the academic findings of this trial. Refer to the Walk + Talk Business Plan for more details.

16,356 words

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Appendix

Appendix 1 – Participant Information Sheet and Consent Form
Appendix 2 – Study 1 Baseline Survey
Appendix 3 – Health Questionnaire
Appendix 4 – Study 1 Follow-Up Survey
Appendix 5 – 4 Stage Balance Test
Appendix 6 – 30s Sit-to-Stand Test
Appendix 7 – Written Participant Feedback
Appendix 8 – Control Group Emails
Appendix 9 – Study 2 Qualitative Interview Prompts
Appendix 10 – Study 2 Qualitative Data
Appendix 11 – Study 3 Final Survey
Appendix 12 – Ethics Approval Letter

Appendix 1 – Participant Information Sheet and Consent Form

MIDDLESEX UNIVERSITY

PARTICIPANT IINFORMATION SHEET

SECTION 1

1. Study title
Walk and Talk for Your Life hosted over Zoom: A mixed methods study on the effects of an online, videoconference-based group exercise and health discussion intervention on mental health in older adults affected by COVID-19 social distancing restrictions

2. Invitation paragraph
You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

3. What is the purpose of the study?

The Walk and Talk for Your Life (WTL) online, 10-week course aims to empower older adults in becoming stronger, develop and maintain healthy habits, as well as improving both mental and social health. Providing a service to the community that can deliver on these aims, online, is now more important than ever, given the limited ability for face-to-face interaction due to COVID-19 social-distancing restrictions.

The purpose of this study is to determine if the WTL programme is effective at improving mental health and is worthwhile to future participants. To enhance the accuracy of this study's findings, some participants will be randomly selected to act as a control group that do not participate in the intervention. You may be selected into the control group and if that is the case, you will be kept informed and be able to participate in the next WTL course following the completion of this study.

This study will be hosted 100% online via Zoom video/audio conference calls. This study is funded by the charity 'Unltd' and is led by certified personal trainer and nutrition researcher, Nicholas Bender.

4. Why have I been chosen?

It is important that we assess as many participants as possible, and you have indicated that you are interested in taking part in this study. You are needed to help test the online version of the WTL 10-week course. You have qualified by meeting the required criteria, and your involvement in this study would be highly valuable to the research. There will be approximately 60 total participants in this study.

5. Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part, you are still free to withdraw at any time and without giving a reason. If you do decide to withdraw from the study then please inform the researcher as soon as possible, and they will facilitate your withdrawal. If, for any reason, you wish to withdraw your data please contact the researcher within a month of your participation. After this data it may not be possible to withdraw your individual data as the results may have already been published. However, as all data are anonymised, your individual data will not be identifiable in any way.

You can also decide to withdraw from the study then please inform the researcher as soon as possible, and they will facilitate your withdrawal. If you would like to withdraw your data from this study, please do so before 1 April.

6. What will I have to do?

If you have not done so already, you will be asked to complete an online form at the beginning of the intervention which includes questions about your availability for the study, background information, lifestyle behaviours, and questions about your mental, social, and emotional health. Next, you will have received a welcome email and be asked to schedule a convenient time for a one-off meeting to speak with the researcher of this study for approximately 20 minutes. This Zoom video call is intended to get you acquainted with Zoom, help answer any questions you may have, and also provide an opportunity for you to partake in two short physical assessments. The first physical assessment will measure your balance through various standing positions and the second will evaluate your lower body strength by standing up and sitting down as many times as you can in 30 seconds. These short assessments will be repeated at the end of the study and these measures will be compared at the end of the study to determine if any changes have occurred. At the completion of the study, you will be asked to complete a similar online survey.

If you are selected to be part of the intervention group, you will meet twice per week via Zoom on times and days you are available. To enter the Zoom call, you will be provided a link, which will be sent to you via email in the lead-up to the start of the programme. You will be asked to allow your video and audio be accessed so that you can interact with other participants during the session. Following a brief informal chat, sessions will begin with 30 minutes of chair-based stretching, body weight movements, and balance exercises. A short break will then take place for participants to use the facilities or make a cup of tea before we return to have a discussion on a health topic such as nutrition, physical activity, the importance of social connection, sleep, and managing and coping with stress.

We ask that you keep your times and days consistent so that you can be with the same participants throughout the 10-week course. While you are expected to attend as many sessions as possible, it is completely understandable if some days you are not able to attend.
Upon completion of the course, participants who completed the intervention will be able to attend weekly maintenance classes to continue involvement after the study period has ended. If you had been selected into the control group, you will be invited to enrol in the next WTL course that is available. This course will be free.
The Walk + Talk course will take place starting on 25 January and complete 2 April.

7. Will I have to provide any bodily samples (i.e. blood/saliva/urine)?

No bodily samples, such as blood, saliva, or urine will be needed for this study.

8. What are the possible disadvantages and risks of taking part?

Participating in the research is not anticipated to cause you any adverse effects or discomfort. Exercises will be done at your own pace. The potential physical and/or psychological harm or distress will be the same as any experienced in everyday life. Risk assessments for all procedures have been conducted and will be followed throughout the duration of the study. Appropriate risk assessments for all procedures have been conducted and will be followed throughout the duration of the study.

9. What are the possible benefits of taking part?

We hope that participating in the study will help you. However, this cannot be guaranteed. The benefits of the online WTL protocol are yet to be tested and this why your participation in this study is so important. Exercise has been known to have a host of beneficial effects. For example, participating in a regular exercise programme has been shown to improve self-confidence, self-esteem, weight loss, and reduce diabetes risks. After completing this course, you will likely improve your lower body strength, balance, and possess a greater understanding on how best to support your health and nutrition in older adulthood.

9. Will my taking part in this study be kept confidential?

The research team has put a number of procedures in place to protect the confidentiality of participants. Your personal data will be anonymised. Your name or other personal details will not be associated with your data. All paper records will be stored in a locked filing cabinet, accessible only to the research team, and all electronic data will be stored on a password protected computer. All information you provide will be treated in accordance with the UK Data Protection Act.

10. What will happen to the results of the research study?

The results of the research study will be used as part of a postgraduate dissertation. The results may also be presented at conferences or in journal articles. However, the data will only be used by members of the research team and at no point will your personal information or data be revealed.

11. Who has reviewed the study?

The study has received full ethical clearance from the Research ethics committee at Middlesex University London Sports Institute who reviewed the study.

12. Contact for further information

If you require further information, have any questions or would like to withdraw from the study or withdraw your data then please contact either:
Nicholas Bender
nick@walkandtalkcic.com

Dr. Anne Elliott
a.elliott@mdx.ac.uk
020 8411 2256

Thank you for taking part in this study. You should keep this participant information sheet as it contains your participant code, important information and the research teams contact details.

Middlesex University Guide to Research Privacy Notices

Privacy notices need to be presented whenever data is collected and should be understandable and accessible. Privacy notices must explain the type and source of data that will be processed. They will also set out the processing purpose, data retention schedules and data sharing. Privacy notices must include details of the subject's rights and who the subject can complain to.

The following example may be used and completed for your research purposes.

Middlesex University Privacy Notice for Research Participants

The General Data Protection Regulation (GDPR) protects the rights of individuals by setting out certain rules as to what organisation can and cannot do with information about people. A key element to this is the principle to process individuals' data lawfully and fairly. This means we need to provide information on how we process personal data.

The University takes its obligation under the GDPR very seriously and will always ensure personal data is collected, handled, stored and shared in a secure manner. The University's Data Protection Policy can be accessed here: https://www.mdx.ac.uk/__data/assets/pdf_file/0023/471326/Data-Protection-Policy-GPS4-v2.4.pdf.

The following statements will outline what personal data we collect, how we use it and who we share it with. It will also provide guidance on your individual rights and how to make a complaint to the Information Commissioner's Officer (ICO), the regulator for data protection in the UK.

Why are we collecting your personal data?

As a university we undertake research as part of our function and in our capacity as a teaching and research institution to advance education and learning. The specific purpose for data collection on this occasion is to assess the WTL 10-week course to improve mental health in older adults.

The legal basis for processing your personal data under GDPR on this occasion is Article 6(1a) consent of the data subject.

Transferring data outside Europe

In the majority of instances your data will be processed by Middlesex University researchers only or in collaboration with researchers at other UK or European institutions so will stay inside the EU and be protected by the requirements of the GDPR.

In any instances in which your data might be used as part of a collaboration with researchers based outside the EU all the necessary safeguards that are required under the GDPR for transferring data outside of the EU will be put in place. You will be informed if this is relevant for the specific study you are a participant of.

Your rights under data protection

Under the GDPR and the DPA you have the following rights:

- to obtain access to, and copies of, the personal data that we hold about you;
- to require that we cease processing your personal data if the processing is causing you damage or distress;
- to require us to correct the personal data we hold about you if it is incorrect;
- to require us to erase your personal data;
- to require us to restrict our data processing activities;
- to receive from us the personal data we hold about you which you have provided to us, in a reasonable format specified by you, including for the purpose of you transmitting that personal data to another data controller;

- to object, on grounds relating to your particular situation, to any of our particular processing activities where you feel this has a disproportionate impact on your rights.

Where Personal Information is processed as part of a research project, the extent to which these rights apply varies under the GDPR and the DPA. In particular, your rights to access, change, or move your information may be limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we may not be able to remove the information that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible. The Participant Information Sheet will detail up to what point in the study data can be withdrawn.

If you submit a data protection rights request to the University, you will be informed of the decision within one month. If it is considered necessary to refuse to comply with any of your data protection rights, you also have the right to complain about our decision to the UK supervisory authority for data protection, the Information Commissioner's Office.

None of the above precludes your right to withdraw consent from participating in the research study at any time.

Collecting and using personal data

Personal data that will be collected will include name, email address, phone number home address, and emergency contact information. This data will be used to allow the researcher the ability to contact the participant about the study or contact the participant's emergency contact information in case of injury or accident. Personal data will be deleted upon the completion of the study and all data will be anonymised prior to data analysis.

Data sharing

Your information will usually be shared within the research team conducting the project you are participating in, mainly so that they can identify you as a participant and contact you about the research project.

Responsible members of the University may also be given access to personal data used in a research project for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations.

Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your records. All of these people have a duty to keep your information, as a research participant, strictly confidential.

If we are working with other organisations and information is shared about you, we will inform you in the Participant Information Sheet. Information shared will be on a 'need to know' basis relative to achieving the research project's objectives, and with all appropriate safeguards in place to ensure the security of your information.

Storage and security

The University takes a robust approach to protecting the information it holds with dedicated storage areas for research data with controlled access.

Alongside these technical measures there are comprehensive and effective policies and processes in place to ensure that users and administrators of University information are aware of their obligations and responsibilities for the data they have access to. By default, people are only granted access to the information they require to perform their duties. Training is provided to new staff joining the University and existing staff have training and expert advice available if needed.

Retention

Under the GDPR and DPA personal data collected for research purposes can be kept indefinitely, providing there is no impact to you outside the parameters of the study you have consented to take part in.
Having stated the above, the length of time for which we keep your data will depend on a number of factors including the importance of the data, the funding requirements, the nature of the study, and the requirements of the publisher. Details will be given in the information sheet for each project.

Contact

The University's Data Contact Officer contact details are:
Middlesex University
The Burroughs
London
NW4 4BT
Tel: +44 (0)20 8411 5555
Email: dpaofficer@mdx.ac.uk

CONSENT FORM

Title of Project: Walk and Talk - Zoom
Name of Researcher: Nicholas Bender

Please initial box

1. I confirm that I have read and understand the information sheet dated ....……………for the above study and have had the opportunity to ask questions. [1]

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason and without penalty. [2]

3. I agree that this form that bears my name and signature may be seen by a designated auditor. [3]

4. I agree that my non-identifiable research data may be stored in National Archives and be used anonymously by others for future research. I am assured that the confidentiality of my data will be upheld through the removal of any personal identifiers. [4]

5. I understand that if agree to participate in a follow-up study, that I may be. interviewed and this interview will be taped and subsequently transcribed. [6]

6. I agree to take part in the above study. [7]

______________________________ ________________ ______________________

Name of participant Date Signature

Nicholas Bender_____________ __03/01/2020__

Researcher Date Signature

Appendix 2 – Study 1 Baseline Survey

What is your first name?

What is your email address?

What is your phone number? (optional)

Walk and Talk sessions are held at the same time, with the same 7-15 participants, twice per week. Being unable to attend a few sessions throughout the course, due to prior commitments, is not a problem.

Typically on **Mondays and Thursdays** what times would you be available to attend our classes online between 25 January - 1 April?

Typically on **Tuesdays and Fridays** what times would you be available to attend our classes online between 26 January - 2 April?

What is your date of birth?

What is your gender?

How would you describe your ethnicity?

What is the highest level of education or the highest degree you have obtained?

What is the highest level of education or the highest degree you have obtained?

Do you live alone?

What is your relationship status?

What is your employment status?

What is the total annual income of your household (before tax and deductions, but including benefits, allowances, and pensions)?

Do you own your place of residence?

During a typical **7-DAY** period, how many times on average do you do MILD/LIGHT kinds of exercise (e.g. fishing, chair-based yoga, easy walking, etc..) for more than 15 minutes during your free time?

During a typical **7-DAY** period, how many times on average do you do MODERATE kinds of exercise (e.g. brisk walking, tennis, cycling, etc..) for more than 15 minutes during your free time?

During a typical **7-DAY** period, how many times on average do you do STRENUOUS kinds of exercise where your heart beats rapidly for more than 15 minutes during your free time?

On a typical **DAY**, how many servings of fruits and vegetables do you eat (these can be dried, fresh, frozen or tinned; one portion is 80g or about the size as a handful).

Please choose the best answer which represents your general feeling (Answers: Yes, More or Less, No)

I experience a general sense of emptiness.

I miss having people around me.

I often feel rejected.

There are plenty of people I can rely on when I have problems.

There are many people I can trust completely.

There are enough people I feel close to.

Over the last 2 weeks, how often have you been bothered by any of the following problems? (Answers: Not at all, Several Days, Half of the Days, Nearly Every Day)

Little interest or pleasure in doing things?

Feeling down, depressed, or hopeless?

Trouble falling or staying asleep, or sleeping too much?

Feeling tired or having little energy?

Poor appetite or overeating?

Feeling bad about yourself - or that you are a failure or have let yourself or your family down?

Trouble concentrating on things, such as reading the newspaper or watching television?

Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual?

Thoughts that you would be better off dead, or of hurting yourself in some way?

Below are some statements about feelings and thoughts.
Please choose the answer that best describes your experience of each over the last 2 weeks (Answers: None of the Time, Rarely, Some of the Time, Often, All of the Time)

I've been feeling optimistic about the future

I’ve been feeling useful

I’ve been feeling relaxed

I’ve been dealing with problems well

I’ve been thinking clearly

I’ve been feeling close to other people

I’ve been able to make up my own mind about things

Over the last 2 weeks, how often have you been bothered by the following problems? (Answers: Not at all, Several Days, Half of the Days, Nearly Every Day)

Feeling nervous, anxious or on edge

Not being able to stop or control worrying

Worrying too much about different things

Trouble relaxing

Being so restless that it is hard to sit still

Becoming easily annoyed or irritable

Feeling afraid as if something awful might happen

How did you hear about us?

You will not be personally identified from any of the answers you have provided, and you can request to withdraw your data at any time. If you would like to participate in the Walk + Talk course, then please press the arrow key below, one last time. This will submit your form.

Appendix 3 – Health Questionnaire

Middlesex University
M01, Mezzanine floor
Allianz Park,
Greenlands Lane,
London,
NW4 1RL

Health Screen Questionnaire

Please answer the following questions. If you have any doubts or difficulty with the questions, please ask the investigator for guidance. These questions are to determine whether the proposed exercise is appropriate for you. Your answers will be kept strictly confidential.

1. Are you: Male or Female (please circle)
2. What is your date of birth?

Day: __________ Month: __________ Year: __________ and Age: ______ years

3. When did you last visit your doctor (please circle)? In the:

Last week   Last Month   Last Six Months

Last Year   Over a year ago

	YES	NO
4. Are you accustomed to regular moderate intensity exercise?		
5. Are you currently taking any medication?		
6. Has your doctor ever advised you not to take vigorous exercise?		
7. Has your doctor ever said “you have heart trouble”?		
8. Has your doctor ever said “you have high blood pressure”?		
9. Have you ever taken medication for blood pressure or your heart?		
10. Do you feel pain in your chest when you undertake physical activity?		
11. In the last month have you had pains in your chest when not doing any physical activity?		

12. Has your doctor (or anyone else) said "you have raised blood cholesterol"?		
13. Have you had a cold or feverish illness in the last month?		
14. Do you ever loose balance because of dizziness, or do you ever lose consciousness?		
15. Do you suffer from back pain that may be made worse by physical activity?		
16. Do you suffer from asthma?		
17. Do you have any joint or bone problems which may be made worse by physical activity?		
18. Has you doctor ever said "you have diabetes"?		
19. Have you ever had viral hepatitis?		
20. If you are female, to your knowledge, are you pregnant?		
21. Do you have epilepsy?		
22. Do you suffer from any neurological disorders or injuries?		
23. Do you suffer from any muscular or ligament disorder or injury?		
24. Do you know of any reason, not mentioned above, why you should not exercise?		
Please fill in any other details relevant to the above here:		

I have completed the questionnaire to the best of my knowledge and any questions I had have been answered to my full satisfaction.

Name (CAPS): ______________________________

Signed: ______________________________

Witness: ______________________________

Date: ______________________________

Please Note: If you have answered 'NO' for questions 4 to 23, and 'YES' to question 24, and you are male 40 years old and female 50 years old, you will be able to participate in the exercise programme or testing. If you have answered 'YES' for questions 4 to 20 and/or 'NO' for question 21, you will need to consult your GP prior to any further participation.

Appendix 4 – Study 1 Follow-Up Survey

What is your first name?

What is your email address?

How do you feel your balance has changed in the past 10 weeks, since the start of the of the Walk + Talk course, which began the week of 25 January? (Answers: Declined Significantly, Declined, Neither, Improved, Improved Significantly)

How do you feel your muscle strength has changed in the past 10 weeks, since the start of the course? (Answers: Significantly Weaker, Weaker, Neither, Stronger, Significantly Stronger)

Approximately, how has your bodyweight changed in the past 10 weeks, since the start of the course? (Answers: I have gained a stone or more in bodyweight, I have gained weight but not more than a stone, My bodyweight has remained stable, I have lost weight but not more than a stone, I have lost more than a stone in bodyweight)

List below any and all diagnosed conditions that you currently have or are recovering from.

On a typical day, how many different prescription medications do you take?

How do you feel your chronic condition changed since the start of the Walk + Talk course, which began on 25 January? Answers: Significantly Worse, Worse, Neither, Improved, Significantly Improved, N/A)

Have you had a fall since the start of the course?

Have you sustained an injury related to a Walk + Talk exercise session?

Have you ever received a shielding note or other formal communication saying that you are 'high risk' from coronavirus?

During a typical **7-DAY** period, how many times on average do you do MILD/LIGHT kinds of exercise (e.g. fishing, chair-based yoga, easy walking, etc..) for more than 15 minutes during your free time?

During a typical **7-DAY** period, how many times on average do you do MODERATE kinds of exercise (e.g. brisk walking, tennis, cycling, etc..) for more than 15 minutes during your free time?

During a typical **7-DAY** period, how many times on average do you do STRENUOUS kinds of exercise where your heart beats rapidly for more than 15 minutes during your free time?

On a typical **DAY**, how many servings of fruits and vegetables do you eat (these can be dried, fresh, frozen or tinned; one portion is 80g or about the size as a handful).

Please choose the best answer which represents your general feeling (Answers: Yes, More or Less, No)

I experience a general sense of emptiness.

I miss having people around me.

I often feel rejected.

There are plenty of people I can rely on when I have problems.

There are many people I can trust completely.

There are enough people I feel close to.

Over the last 2 weeks, how often have you been bothered by any of the following problems?
(Answers: Not at all, Several Days, Half of the Days, Nearly Every Day)

Little interest or pleasure in doing things?

Feeling down, depressed, or hopeless?

Trouble falling or staying asleep, or sleeping too much?

Feeling tired or having little energy?

Poor appetite or overeating?

Feeling bad about yourself - or that you are a failure or have let yourself or your family down?

Trouble concentrating on things, such as reading the newspaper or watching television?

Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual?

Thoughts that you would be better off dead, or of hurting yourself in some way?

Below are some statements about feelings and thoughts.
Please choose the answer that best describes your experience of each over the last 2 weeks
(Answers: None of the Time, Rarely, Some of the Time, Often, All of the Time)

I’ve been feeling optimistic about the future

I’ve been feeling useful

I’ve been feeling relaxed

I’ve been dealing with problems well

I’ve been thinking clearly

I’ve been feeling close to other people

I’ve been able to make up my own mind about things

Over the last 2 weeks, how often have you been bothered by the following problems? (Answers: Not at all, Several Days, Half of the Days, Nearly Every Day)

Feeling nervous, anxious or on edge

Not being able to stop or control worrying

Worrying too much about different things

Trouble relaxing

Being so restless that it is hard to sit still

Becoming easily annoyed or irritable

Feeling afraid as if something awful might happen

Assuming you were available, would you be able and willing to pay a monthly fee of £18.99 (equivalent to £2.11 per session) to continue your participation with weekly Walk + Talk maintenance classes?

What is your preferred availability for continuing once weekly Walk + Talk maintenance classes, which would begin the week of 3 May?

Would you please provide open-ended feedback, as long or as short as you'd like, about your experience with Walk + Talk. Feel free to elaborate about how you feel the course has impacted your physical, mental, and social health. Also feel free to include the parts of the course you enjoyed the most as well as the areas you would like to see improved on moving forward.

You will not be personally identified from any of the answers you have provided. If you would like to submit your answers, then please press the arrow key below, one last time.

Appendix 5 – 4 Stage Balance Test

ASSESSMENT CONTINUED

The 4-Stage Balance Test

Patient ______________________

Date ______________________

Time ______________________ ☐ AM ☐ PM

Instructions to the patient:

- I'm going to show you four positions.
- Try to stand in each position for 10 seconds.
- You can hold your arms out, or move your body to help keep your balance, but don't move your feet.
- For each position I will say, **"Ready, begin."** Then, I will start timing. After 10 seconds, I will say, **"Stop."**

	① **Stand with your feet side-by-side.**	Time: _________ seconds
	② **Place the instep of one foot so it is touching the big toe of the other foot.**	Time: _________ seconds
	③ **Tandem stand: Place one foot in front of the other, heel touching toe.**	Time: _________ seconds
	④ **Stand on one foot.**	Time: _________ seconds

ASSESSMENT

30-Second Chair Stand

Purpose: To test leg strength and endurance

Equipment: A chair with a straight back without arm rests (seat 17” high), and a stopwatch.

NOTE: Stand next to the patient for safety.

① Instruct the patient:

1. Sit in the middle of the chair.
2. Place your hands on the opposite shoulder crossed, at the wrists.
3. Keep your feet flat on the floor.
4. Keep your back straight, and keep your arms against your chest.
5. On **“Go,”** rise to a full standing position, then sit back down again.
6. Repeat this for 30 seconds.

② On the word “Go,” begin timing.

If the patient must use his/her arms to stand, stop the test. Record “0” for the number and score.

③ Count the number of times the patient comes to a full standing position in 30 seconds.

If the patient is over halfway to a standing position when 30 seconds have elapsed, count it as a stand.

④ Record the number of times the patient stands in 30 seconds.

Number: ____________ Score: ____________

Patient ____________

Date ____________

Time ____________ ☐ AM ☐ PM

SCORING

Chair Stand
Below Average Scores

AGE	MEN	WOMEN
60-64	< 14	< 12
65-69	< 12	< 11
70-74	< 12	< 10
75-79	< 11	< 10
80-84	< 10	< 9
85-89	< 8	< 8
90-94	< 7	< 4

A below average score indicates a risk for falls.

Appendix 7 – Written Participant Feedback

WTL-Z Intervention Group Feedback Study 1
One of the most positive aspect during the 3rd look down. Amazing group of people in our team, open, shared experience, great tutor. – Participant 1, female, 68 years old

It has been a fantastic experience. It was far better than I could have imagined. Nick led the group so well with his knowledge and enthusiasm and it has encouraged me to take more exercise and to think more about my physical and mental health. Also the group bonded very well during the 10 weeks of the course. Thanks Nick ! – Participant 2, male, 71 years old

One thing that I might have said is that I'm now feeling OLD which is something that I've never considered myself to be so that's a feeling that may have come out of lockdown and/or what the monster is doing to my body. Feeling OLD is alien and not nice. My 40 year old friend who I was with earlier says that she never considers me as OLD because I just don't behave it😃Connecting with others has been very beneficial, not least as we had common needs and experiences and quickly bonded. This was most certainly in part by the enthusiasm of the course leader who drew us together in many ways. Mentally and socially it was a huge benefit , especially during the restrictions on us arising from the pandemic . A place to meet on a regular basis gave a sense of purpose. Exercise as a group was made enjoyable with no pressure on individuals to exceed beyond their ability. Learning more about various aspects of diet and other behaviours was very useful and delivered in a way that was understandable and trusted. Taking part in conversations allowed individuals to voice opinions which were heard and totally non judgmental and everyone having the space to do so. Walk and Talk outside in a group is everyone's aim but given that is not possible now I feel that the course was adapted well so as to maintain the core objectives on line. I am sure that some of the learning, especially new habits will stay with me. I have been suffering erratic symptoms of Long Covid which I think has impacted on my outcomes knowing that I could do better, in better health and yet I have been able to improve mentally and grow stronger. Living with the mystery of Long Covid would have been much worse without the support of walk and talk in so many ways. The course leader was inspiring, enthusiastic, knowledgeable and fun. Thanks for the opportunity. I really hope that we can continue in some way. – Participant 3, female, 74 years old

Please delete recommendations about quack doctors - they are dangerous. E.g. Dr Mark Hyman. I find it indeed unacademic that someone who misuses scientific papers to push their theories features so prominently in discussions as though his lunacy was the only immutable truth. – Participant 4, male, 75 years old

Overall I have enjoyed the course despite being virtual, though very handy that way to access. It's been good to get to know the people in the group and hear different perspectives. I've gained some new knowledge and understanding about people, health and well being. Also introduction to exercise I wouldn't normally do. – Participant 5, female, 65 years old

I have enjoyed taking part in the course, it has made me stay motivated with my own exercise and am improving and building healthy habits. I have managed to loose half a stone and hope to continue with this. (I have also stayed motivated to walk further , 890,000 steps,since the start of Feb probably double what I did before). I have signed up now to the NHS diabetes prevention programme, I opted for the online Oviva course as did not want to commit to more meeting times, particularly with the prospect of an easing in lockdown. The same

would go for ongoing maintenance sessions with Walk and Talk, I would not want to let them prevent me from getting back more into the outside world. Am looking forward to 4 separate weeks away in the UK over the summer/autumn (walks every day of course because of Corky). I am doing several exercise classes a week with Goldster (was care visions) and have kept up with these, I like being able to exercise at home and find it far easier to do than having to turn out to classes which eats far more into my day. You have been really good at remaining upbeat with us all, remembering small details about us, giving everyone space to talk, being able to shut down the more garrulous of us and gently coaxing the quieter ones to speak. It has also been good to learn from the experience of others in the group. It has been really obvious how some of the group have really blossomed over the weeks. The classes have been well paced with a good balance between talk and exercise. It has been helpful to receive the information and short video clips before each session, also the links recommended by others in the group. I have found all of the sessions useful Having spend a decade in teacher training and having observed and given feedback on countless lessons to numerous trainees, part of me has been conscious of how you have been working with us (sorry force of habit).It has been great to see how you have brought together a group of strangers and slowly scaffolded and enabled them to become closer and to help each other. You have gradually increased the difficulty of the exercises without us really noticing, it has been useful too that you explain why we are doing each of them. You have valued everyone's input bringing us back to the point if necessary or letting us go off on tangents in these prove helpful. It has been useful to return to topics to help us embed with at we have learnt. Facilitating the WhatsApp group was really useful at bring the group together, the contest between the groups walking New Zealand was a great idea. Don't do yourself down by saying the learning on insulin resistance is boring. I think this is really important for us all (though I am also probably saying this as someone on the edge of diabetes and with widespread osteoarthritis - all linked as was made clear) I am sure with even further thought you could make this even more interesting. Sometimes some subjects are difficult to learn and may take more concentration from the learner than with others. – Participant 6, female, 62 years old

I have really enjoyed these classes. Making a twice weekly commitment to attend has engendered a feeling of accomplishment. Nick has been extremely encouraging and inclusive and really listens, making sure no one is left out. The exercise has left me with increased flexibility and stamina and confidence in my body. It has been good to connect with a group of likeminded people and feel safe in that space. The discussions on all aspects of health have been very useful alongside the links to videos and the opportunity to ask questions and listen to other's experiences. I have enjoyed all aspects of the course and the only improvement I would like to see would be to receive links to relevant information and videos a few days before class. – Participant 7, female, 65 years old

Though caring for my aged husband since mid-2017 it wasn't until early December 2020 that my left hip started to hurt. I suspected it was because of having to mount and descend stairs several times daily, but as a result of seeking medical assistance I was X-rayed and learned there's some arthritis in the area. Physio was prescribed and I was advised to walk for just 10 minutes daily, to lead with my right foot when ascending and get the left to join it before proceeding to the next rung and when descending, to lead with the left and get the right to join it before proceeding. I continued to follow directions daily and then my right shoulder and ankle started to hurt. At the seated Pilates class I started a fortnight ago the tutor recommended I hold both banisters, do a pelvic floor movement and ascend each rung as normal and the hip responds well. After the Easter break I expect to learn how to deal with the shoulder and ankle. Meanwhile learning about insulin resistance in the last 10 days at the

Walk & Talk sessions and hearing Dr Chatterjee speak on You Tube, I eat protein for breakfast whch has eased the shoulder pain. Despite applying 12-hr Voltarol to the three areas daily, my hip plays up at the end of a 10-minute walk and I limp noticeably by nightfall but thankfully, the discomfort does not affect my movement when exercising. I have always eaten a rainbow diet, never been tempted by fads; have always been out and about to which the pandemic put a stop, leading me to reach for food/snacks every two hours. It wasn't until Nick Bender mentioned the benefit of giving the stomach a rest that I now eat at four hour intervals. Since taking stock of my day before bedtime and enumerating the items/instances that occurred for which I have been grateful as Nick recommended, I drop off to sleep easily and wake up cheerfully around the same time each morning without the need for an alarm. Though the habit I started to shut down my laptop, keep away from the phones and TV after 9 pm went to pot three days later, I shall persevere to the best of my ability. Maybe once the imminent move to my flat is accomplished the recommended routines will come into force permanently. Nick has my undying gratitude for all his insights and signposting that I know will stand me in good stead, especially as I have started my eighth decade. – Participant 8, female, 82 years old

I enjoyed the course. Unfortunately I had a problem with my heart (unrelated to the course) which meant having a STENT fitted half way through which meant that I was unable to participate in the exercise part of the programme. I think the most useful part of the programme was the group interaction. All of our group participated and were very open, which may well have been enhanced by the safety of meeting online instead of in person. I found that there was plenty to reflect on outside of the sessions. The content of the topics which were covered each session was very helpful. – Participant 9, male, 67 years old

I enjoyed W&T. It was difficult to attend the classes as I don't typically stop work until much later but because this was part of Nick's Masters I made a special effort and so I received the benefit. Left to my own devices I may find it difficult to maintain consistent attendance. – Participant 10, female, 55 years old

I feel I have benefitted greatly from my participation in the Walk + Talk classes. I have learnt a lot of invaluable information and the exercises have been very beneficial to my health. The social aspect has also been highly important and being able to be part of a team has been amazing. The course has given me something to look forward to and the walking challenge has been a great incentive to become fit. Also, might I add that Nick has been wonderful and very engaging with the group. He is very knowledgeable and not to mention funny! He goes out of his way to help everyone and shares a wealth of information with the group. Overall I would recommend this course to other older adults as I feel it has improved my mental and physical well-being immensely! Well done, 10/10!!
– Participant 11, female, 55 years old

I enjoyed the sessions and meeting others from different walks of life. I like the exercise and the discussion about health and well being. – Participant 12, female, 74 years old

The walk and talk classes were very beneficial for me. I looked forward to attending them twice a week, the group were very supportive and I really enjoyed the walking challenge it motivated me to work more. The leader made it fun too. – Participant 13, female, 54 years old

Informative physically made me feel stronger mentally stimulated less isolated during this time. Quite enjoyable Making time to relax and exercise Time just for yourself but 5.15 is an awkward time for me as its best not to eat before and too late to eat after. A discussion session on various news topics would be good as if you live alone there is no one to talk about latest topics .It was good to set goals eg steps challenge New Zealand trek. Also a recipy of the week to try new foods. would be good. Or a book of the month (when able to shop). Good to view links on relevant subjects. – Participant 14, female, 74 years old

This was a new experience for me, being with like minded people in an environment which allowed open dialogue was positive. Learning about aspect of health and nutrition gave me the opportunity to be reflective on information learnt in other formats and make sense of this. Having other peoples direct experiences shared gave me the opportunity to feel I was not alone in my thought process. Nick was warm and informative willing to accept other perspectives. Sharing information regarding accessing additional material if so desired. Would I join a group such as this again yes! – Participant 15, female, 57 years old

it has been amazing for my mental health. I suppress my feelings a lot, a few times I have forced myself to attend as I have been so miserable the session has lifted my mood considerably. We have laughed a lot. It has been better to meet twice a week rather than once as it keeps the momentum going.. So pleased to have been a participant lots of links provided which are useful. Thank you – Participant 16, female, 75 years old

I really enjoyed the course from start to finish. It really helped me to socialise with people. though I have family it is good to have people my own age who can relate to things which happen at our time of life and who dont see you as an old dinosaur. Nick is amazing at pulling everyone together and getting everyone involved. He should be called the new Mr Motivator. I enjoyed the exercise classes and at times I really didnt feel up to doing the exercises but seeing everyone really pushed me. The talks on foot and nutrition were very very good. I would very much like to continue with the classes. Thank you. – Participant 17, female, 60 years old

Really enjoyed the classes but struggled to attend regularly owing to work and travel commitments. – Participant 18, male, 65 years old

I feel that participating in the course and programme has made an immense different and improvement to my physical and mental health. I will now go out everyday and walk 10,000 steps. Prior to taking the course, my anxiety and depression would be so bad that I would not go out, sometimes, for three days or days at a time. I plan my day and try and go out early. I have a renewed enthusiasm for exercise. I was inspired to start my own daily whats app group and have done three monthly daily Yoga With Adriene programmes (Boot Camp, 30 days of Yoga and Revolution in Feb, March and April). I want to get a fitbit so I do not use my iphone when I walk. I have a lot more energy and enthusiasm for a lot more things and activities. I have a renewed interest in activities I had lost interest in following my depression and PTSD diagnosis ie Ayurvedic medicine, Yoga, diet. I follow Nick's advice and example and my 'cheat' foods are sweet potatoes and sour dough bread. Nick is a good role model and very personable and friendly. Also, I enjoy the whats app group and having a support group of eclectic and very different course participants. We are all very different but we have bonded and support each other in the whats app group. I feel that I have go to know people from different parts of London and different cultures and backgrounds who I would have not met before; also i have learned a great deal from the other course participants. It was another

course participant who mentioned an ayurdevic treatment of eating coriander seeds soaked in water overnight that renewed my interest in ayurdevic medicine. I am able to share recipes and my interest in food with like-minded people and I feel supported. Thank you! I feel privileged to have been chosen for this course and feel that it has greatly enriched and enhanced my life. I had a reason and a purpose to get up in the morning at 10 a.m. and I looked forward to class. I feel inspired to continue the habits I have learned in this class because I feel connected to Nick and he really made an effort to connect and get to know everyone on the course. I was also touched when he emailed me at the weekend and really went out of his way to contact me when I was upset/triggered about something another participant had said during a class. I have done two 10-week GP referred weight management classes with Better Gym and attended a weekly nutrition class and an hour long gym session, however I found this class was much better than the service I attended with Better because the activ ity was broken down into two sessions and week and Nick organised the classes thematically and used very interested and unusual Ted Talks to touch on topics rather than adopting a more traditional approach. His perspective was global and inclusive and he was not afraid to admit that his students were teaching him new things ie about tongue scrapping and Ayurvedic medicine. It felt a lot like a two-day process where we were teaching each other and Nick was learning and gaining from our life experiences. I felt valued and an equal to Nick, which often does not happen in class. I also shared a lot of the videos that Nick showed us in class (ones from his You Tube channel) with my friends and with other groups I am a member of, such as Core Arts. These were warmly received and my friends remarked that Nick seemed very dynamic. Nick is also very well-travelled and brought a global and diverse perspective and was very interested to hear about his students' cultural background. I also found him to be a very kind and compassionate person. Attending this class has really helped me deal with lockdown and being isolated from my family in Oxford and my friends, who mostly live outside London. Thanks Nick for helping me make such a huge and positive difference to my life and improve my health. I also found the course really interesting as I was 51 and one of the younger people in my class; it was interesting for me to hear the experiences and issues of people in the class who were about 10 years old than me and it provided me with, in a way, an early intervention health strategy to address not becoming pre-diabetic like my mother and address improving my physical activity. Attended this course felt like a much needed 'wake up' call during lockdown to address areas of my life that I had been neglecting like my diet and my physical health. I feel that my stamina and energy levels have greatly improved. Thanks Nick! – Participant 19, female, 52 years old

I thoroughly enjoyed working with Nick and all the ladies on the course. It has been a great experience. Nick is very professional, friendly and does not put pressure on you. As the weeks went by, we all gelled and were relaxed enough to share issues about our health, personal circumstances and where we are in our lives. Having the app group meant that we were able to keep in touch with one another and ask others for help or suggest things for people in the group having trouble with various issues. Nick provided us with different links each time but I could not read them due to being busy with voluntary organisations that I work with. The app is good but so much information came through that I could not look at. However, one of the work outs 5000 steps I have used. Working towards a goal i.e. walking to a point in New Zealand and competing with other groups was very good as it gave you a sense of achieving something and working with the other ladies so we supported one another. Much better than going to a gym. One thing I forgot to mention is that I am on a five week self defence course using kraf magrah and I would not have done this without going on your course first. You gave me confidence to do this even though my lumbar spinal fusion prevents me from doing some moves. – Participant 20, female, 67 years old

Participation in the group has been important as it's given me something to look forward to and to interact with others. I was surprised that our group were all women. Nick has been an excellent coach. I found him considerate and empathetic. I've been limited by chronic conditions but have enjoyed participating in the upper body and balance exercise and plus learning about the wall press type of exercise which I can manage even when my physical / pain conditions are at the worst. I would find it useful to have an aide memoir for the exercises as I don't retain information very well and some aren't on the video. The only aspect of the course I've not enjoyed the shadow boxing as I find it difficult physically and dislike the sport. I would like to participate in maintenance class but am on benefits so very low income. – Participant 21, female, 63 years old

I enjoyed the course although I am much fitter than I thought and as such, I found the exercises easy to do and not challenging. The weekly discussion topics were interesting and I learnt a lot even though I consider myself well versed on a wide range of holistic health and wellness matters. The host, Nick, is a very personable and likeable person. He was excellent at politely reigning in those who dominated our conversations and at giving everyone an opportunity to speak and share their knowledge and experiences. It would have been nice to have some male participants in the group other than Nick! – Participant 22, female, 56 years old

I have enjoyed all aspects of the Walk + Talk sessions, the exercise sessions have been appropriate to me with my various health issues and weight issues. I have enjoyed the discussions and feel that we have covered a wide variety of subjects all relevant to a general all round improvement to life. The group of participants was just about the right number to encourage chat and share experiences and Nick is excellent at including everyone and allowing all to express their opinions. I found Nick to be very interesting and motivational. My all round health has improved and coincidentally this course just happened to take place at the same time that I signed up to the Second Nature programme which has resulted in a 19lb weight loss to date and Walk + Talk compliments Second Nature very well. I am very keen to continue with Maintenance classes although have some concerns about the possible walks as a group in London due to my general fitness and walking is problematic for me, also I live in Kent and I am not comfortable with travelling into London at the moment. I have not really ventured very far due to the Covid pandemic and I am feeling nervous and anxious about getting back out there and feel rather scared of the virus. I would like to thank Nick for all his help and guidance and wish him well going forward. – Participant 23, female, 65 years old

The timing for this course has been perfect - my lockdown life was lacking structure, so to have 2 mornings a week in the diary really helped define my week. Nick is the perfect host - he is enthusiastic, inclusive, encouraging, full of useful information & all with good humour. We had a wonderful mixed group who were all very keen to participate - apart from the boxing, which bothered some peace-loving people. Personally I thought it was fun to try something new & took the idea of giving someone a right hook in the non-serious light that was intended. I definitely improved my upper body strength & stamina for aerobic exercise. I hope I will continue with the arm exercises using tins of food or bottles of wine, although I question how much I'd do this without input from Nick. My attitude to food has definitely changed thanks to walk & talk. I understand nutrition labels better than I did & try to eat more healthily, avoiding processed foods much more than I did before. I may come back via

email with more observations, but will finish this survey now :) – Participant 24, female, 53 years old

I enjoyed the course as it’s been good to meet new people during lockdown and regularly do exercise . I found the discussion topics interesting and the signposting to different talks and reading material was very good and well done. I think people were hesitant to talk in depth about their issues as it’s hard to do online and I missed having more of a sense of a whole person. I liked the exercise programme but really disliked all the references to boxing and fighting other participants. I found it very male and inappropriate for a group of mainly older women. I know it was meant to be jokey but punching into the air vigorously can achieve the same result. I think having both male and female facilitators might be good to encourage more discussion. I think Nick did really well to try and include everyone in the programme at every session . Not an easy thing to do and it was often a lot of fun. Thank you Nick for an excellent 10 weeks. – Participant 25, female, 71 years old

I enjoyed connecting with the other group members, and most of the exercises. It was good having regular sessions to attend. I felt that some of the exercises were too difficult for me. I am not able to jump, owing to knee problems and I do not enjoy shadow boxing. The discussions were good, and I intend to try cutting down my intake of carbs. I will try other forms of exercise, and would prefer to attend a class in person when possible. – Participant 26, female, 80 years old

The course was important at this time due to lockdown and winter. It provided structure to the week in a purposeful way. The experience was wholly positive: the tutor was professional and well informed; the other participants were a pleasure to meet, a really warm supportive group; the information provided was interesting and helpful and relative to me; excellent communication which was timely and often had bonus jnformation:) In the absence of live classes it was brilliant but ideally I prefer live classes. The most life changing element was the nutrition info particularly the explanation about insulin, I wish I had known that 50 years ago! The information about Adrienes yoga will be ongoing for me too. I will miss having the sessions to get me up and going twice a week. I hope to carry on for the follow up classes, will see how that pans out... thank you so much. – Participant 27, female, 65 years old

I have enjoyed this course immensely. The knowledge gained about food choices has been invaluable, as has the exercise needed to maintain optimum health. The social interaction with everyone involved in the course has been greatly uplifting, and the common sense help given has been much appreciated. I have felt much stronger and able to walk longer distances than I did previously, and the better food choices has also impacted on my physical health. Also interrupted sleep had been a problem for me previously, and now with knowledge gained from the course, this is being dealt with in a positive manner. Although this was not the primary reason for joining the course, the part I enjoyed most was the social interaction. And Nick's insightful knowledge, empathy and humour were an integral part of the course. – Participant 28, female, 81 years old

I appreciate Nick's attitude. He was always positive and encouraging. Talking with the other ladies was good as I was inspired by their efforts. Happy to be able to share my ideas on healthy food and cooking. – Participant 29, female, 46 years old

The course has run at a time of heightened anxiety for me. Two stress inducing events at once and neither resolved by the end of the course. This is why my ratings may not have

improved. I enjoyed the talking aspects of the course and the links were good. I tried to follow these up ahead of each class and have kept them for reference in the future. The group gradually built a sense of cohesion and there were life experiences that participants shared openly. I'm grateful for these. I wasn't so keen on the adversarial set up for the walking challenge. I don't think it was necessary or helpful to have winners and losers. I felt under pressure to beat a group who were likely just as anxious as I was. The examples of participants who had made small changes were really encouraging. Focusing on the five pillars was easy to grasp and though I can see how to make progress on some, there are others that remain elusive. – Participant 30, female, 57 years old

During these sessions it has really given me the opportunity to feel like part of a community, this has really helped me and even given me the push to finally start Four Paws & Company a dream of mine for the last few years. Once I have a few more clients and I am a bit more financially stable I would love to be part of your maintenance groups. I have really enjoyed attending the groups, I don't normally attend group sessions and struggle to be part of groups of people I don't know. I never felt pressurised to join into the conversations and felt comfortable enough to eventually participate. I feel Nick managed the timings and conversations in an inclusive way without making anybody feel uncomfortable. I really enjoyed being part of the walk across New Zealand much more than I thought I would and it really encouraged me to get out and walk a little more and to become conscious about how the exercise was benefitting my mental health. The idea about making small changes will be something that I will carry with me forever as normally I make big changes that make me feel overwhelmed, I am already seeing significant benefits from my small changes which have benefitted my sleep, intake of water and exercise that can be from a few minutes a day or 15 mins. The exercises were simple but achievable and the shoulder exercises shown have not only benefited me but also my friend. Thank you so much Nick it has been absolutely amazing to be a part of this group and I really, really wish you well – Participant 31, female, 53 years old

Walk+Talk has far surpassed my expectations. It has stimulated me in every area of my life to think about things and be more mindful. I think the way the course unfolded was very good and the subtle revisiting of topics helped to reinforce small positive changes. I think the Course Leader's enthusiasm and ability to promote the social aspect made it easy to feel part of a group and share experiences and to engender support and empathy for one another. He was brilliant at facilitating this. I would never have thought that could happen on a zoom meeting. I looked forward to each class and felt committed. The area that has probably informed me most is the approach to nutrition. Having stated that, I think the holistic approach and the five Pillars of Health reinforced the need to work on each one, which I'm trying to do. I probably find mental health the hardest to implement changes, but I find the gratitude approach helpful. There's been lots of material for us to read and the Course Leader was excellent in signposting us to further information. He was also good at finding out and following up information we had and disseminating it back to the group. I would like to think that my labile blood pressure has lowered and I could discontinue the small dose of the anti-hypertensive drug I take, in due course I will discuss it with m GP. I stated that I have fallen since the course started. This is not unusual for me, but working on my balance should help. The only small criticism I have is the star jumping in the exercises we did. For me they are high impact and I would have preferred another way to get some aerobic exercise. The boxing was brilliant. I would love to carry on with a maintenance class especially if we can look forward to meeting up as a group. I feel very lucky to have found this course to take part

in - thank you, it's definitely having a positive effect on my life. – Participant 32, female, 68 years old

I have thoroughly enjoyed this course and have learnt a great deal. I have enjoyed meeting Nick and all the class members. I think this has been especially good at this time of lockdown when I have been at home much more and have had the time to attend. I think I would have found it difficult to commit so much time if I had been in my usual routine and working away from home. The part of the class I enjoyed the most was talking about food and nutrition and I have changed my diet as a result of the course. I have reduced my carbohydrates and increased my vegetables. I have also been drinking a lot more water. I think there is so much conflicting advice about food these days that it is difficult to know what to believe but being able to discuss it clarified a lot of things for me. I have also increased my walking since the start of the course and found the walking challenge and posting our steps on the WhatsApp group every day motivating. I did not really like the group exercise- it was useful for learning strength exercises but I have never been a fan of group exercises and prefer to exercise on my own. I will continue with the exercises that we learnt and I also do more exercises snacks. One of the things that will stay with me from the class is that at my age it's not too late to make improvements to my health. I would be interested in keeping in touch with the group for occasional walks maybe in central London or on WhatsApp or Zoom meetings but I would not want to continue with the group exercises. Overall a very positive experience and I feel this has pointed me in the right direction to improve my fitness and health. I found that the group bonded very quickly and were easy to chat to. – Participant 33, female, 62 years old

I have never walked for pleasure, I never saw the point. I used to regularly walk instead of getting a bus as 'free exercise'. Since the course, I've increased my walking and focused more on my sleep patterns. I feel so much more awake and focused than I did before the start. I also feel more mentally stable, calmer. I found some of the exercises difficult due to joint pain, but I persevered. The mindfulness I found difficult at first, but by the end of the course I always felt better after it, so I should look to include the mindfulness and neck stretches into my daily life rather than just twice a week. – Participant 34, female, 55 years old

I have enjoyed Walk abd Talk much more than I originally thought. I genuinely feel more positive than I did two months ago and think that some of this has developed through the sessions. I think I have learned a great deal on the course for example Re nutrition, the importance of sleep and exercise from Nick and the other participants. Some things were new to me and other information challenged my previous beliefs and unhelpful habits. I also have found it mentally stimulating to meet and share opinions and ideas with other women of similar ages but a variety of experiences. Also the summaries before and after each session from Nick with links to additional information sources / exercise classes / meditation tutorials etc and follow up information have encouraged to further explore learning from session or discover new ways to obtain guidance or help more suited to my individual needs. Nicks enthusiasm is infectious but I never felt I was being pushed to accept his ideas but I was encouraged to try things and find out what worked for me. Some of the exercises were challenging for me but I always felt safe and allowed to only to push myself 7/10 I will miss the sessions and do feel that the other participants became friends with whom I'd like to stay in contact. I think the ‘ maintenance ‘ classes could help the new healthy habits I've established to take hold and also for the relationships in the group to develop. – Participant 35, female, 68 years old

Control Group Feedback Study 1
Feel free to provide other feedback about your experience as part of the control group throughout this study. For example, explaining any changes in your health over the past 10 weeks or elaborating on what exercise classes or health relates courses you attended over the past few months:

I participated in the Hornbeam's Walk through Winter project in February. I had six sessions with a trainee therapist using the Resilience Toolkit – Participant 137, female, 63 years old

Thanks for suggesting Second Nature- I have lost nearly 10kg and learned a lot about the psychology of eating. I have started a little more exercise but could do with some help- I would like to get back on a bike! During this time, I have continued with my zoom pilates - 2 short classes and 1a 1-1 session each week and some walks plus " snack exercise" when I remember!. I have also just started to see a counsellor on a weekly basis for help with a relationship issue. Your contact prompted me to look at myself mentally and physically and see what I can improve. I have a knee and hip replacement and prone to PEs tho' this is controlled via tablets, and an under active thyroid. – Participant 138, female, 65 years old

I have not experience activities of this program, so I don't want to take a place and then no to complete the 10 weeks. It is better to give a place to somebody that may benefice more than me. Thanks. – Participant 142, male, 75 years old

Mood was badly affected because my dog was very ill and then sadly died. – Participant 143, female, 69 years old

I am not fully myself yet. I am still suffering from the Covid I had late December. It affect my breathing and I am coughing. I have become physically weaker due to it. – Participant 144, female, 64 years old

I have attended a zoom keep fit class Monday and Thursday 35 minutes and Tuesday Wednesday and Friday 1 hour class only missing a session occasionally. – Participant 146, female, 72 years old

I contracted Covid in mid-January and was ill (at home) for about 4 weeks, recovering fully after about 6-8 weeks. I have attended yoga and Qi Gong classes occasionally. – Participant 147, female, 68 years old

I attended a pilates zoom class for several weeks in January but found it very hard going as my balance is poor. I also find I have to look at the tiny ipad screen which interrupts my pose. I think I wasn't set up properly for effective exercise class so I would try to set up on my TV in any future exercise class indoors. I hope in the new course we can meet up outdoors for a walk. – Participant 148, female, 58 years old

Since I was in the control group my health has deteriorated, my balance is worse, my lung disease is worse and arthritis worse. I have been eating more and exercising less as my lung disease flared up. My arthritis flared up again and I have more pain in my joints. My mood worsened. This was partly due to being Shielded but also because of cold and damp weather. – Participant 150, female, 72 years old

WFH and lockdown have left me more unfit as I walked a lot at work. So now need to lose some weight and regain some fitness. I use NHS Active 10 app to record brisk walking and Walk at Home (YouTube classes) which are great. – Participant 151, female, 64 years old

On Zoom I have a weekly exercise class and a Tai Chi class. In the exercise class we use weights or as in my case two large tins of potatoes. Recently I was surprised to be able to open jars and bottles by hand without needing a gadget. Feel fitter in some ways. Mowed the lawn this week and found easier, than last year. Though I have recently noticed that although my legs are strong, I cannot walk up hill as fast as I could before the pandemic as I get out of breath if I do, assume due to putting on weight and not walking so much. Local parks unattractive as overcrowded, paths narrow. Home deliveries of everything too. So I know the solution. – Participant 152, female, 70 years old

As a result of your recommendation to build exercise into my routine, I have been doing pressups before every shower, which has had a noticeable effect on my upper body strength already. – Participant 155, male, 66 years old

I had a fall that really set me back with my exercises, also high blood pressure and is now much better. I am feeling a bit more confident to move forward with exercise now than I did before. SHE MENTIONED THAT THE EMAILS WERE HELPFUL IN OUR CONSULTATION. – Participant 156, female, 65 years old

I followed 'Workout the right way' with Mark Wright for over 3 weeks and now follow the 15 min workout on iplayer when time permits. Apart from that, I walk a lot, do gardening, cleaning and carry my shopping. I feel good and is in good health but would like to improve meditation and mindfulness by participating in group sessions. Thank you Nick. – Participant 157, female, 60 years old

Immediately following my balance test with Nick, my knee couldn't bear weight any longer and that continues, and I can now walk very little - I can't determine what the exercise may have done to cause this. I am awaiting an in-person physio assessment. I would like to exercise and join in on a class but would prefer to have had that hands-on assessment first in case I aggravate things further. If there's an opportunity after this next course, I may be interested. Thanks. – Participant 159, female, 74 years old

I had a heart attack due to physical causes some 6 weeks ago had 10 days in hospital came out with defibrillating pacemaker. Currently on very gentle exercise routine until check up on next two Thursdays. Not sure if I could or should do the course at this stage hence my comment about doing it. – Participant 161, male, 77 years old

has had a lot of pain and a lot of problems during the period of exercise. Has an unstable pelvis. – Participant 162, female, 69 years old

Useful tips from Walk & Talk course facilitator Nicholas on general health & well-being. From the first consultation I had with Nicholas I have continued exercise and added a daily mile walk in the park. I have also joined Slimming World and lost almost a stone in weight. I'm currently studying at the moment to start a foundation course of study in September. Thank you so much Nicholas and Walk & Talk for this very much needed programme. – Participant 163, female, 66 years old

I was walking 15 mins approx each way to & from my evening job during the past 10 weeks until the end March 2021. Now the job has finished so not going out regularly. – Participant 165, female, 57 years old

My schedule changes almost weekly due to various Dr and hospital appts and chemo sessions. So I would have to fluctuate between classes accordingly. – Participant 168, female, 64 years old

did 9 week couch to 5k from ourparks. Joined up with aidfit app. – Participant 169, female, 57 years old

As a result of being in the control group I decide to set time aside for myself to do more exercise and also had 7 weeks councelling with Mind. I am now doing 2 regular yoga sessions a week, one breathing practise and a regular walk. I did do a couple of more energetic classes but times have sometimes clashed. I can't join the next course as am returning to work in May and want to continue with my yoga classes. I would be interested in future courses. Twice a week for the time required is a lot to fit into my schedule. – Participant 172, female, 52 years old

WTL-Z Intervention Group Feedback Study 3
Feel free to provide other feedback about your experience as part of the control group throughout this study. For example, explaining any changes in your health over the past 10 weeks or elaborating on what exercise classes or health relates courses you attended over the past few months:

I've had a really positive experience and feel it's got retirement off to a flying start! It's helped me feel very optimistic about the future and how to make it a healthy one (as far as that's within our own hands). The content about nutrition and social aspects, such as loneliness, has been very useful; in particular, videos on how to get up from falls and balance exercises, for example, are highly practical and will be kept for future reference ...Nick has been a great trainer, very encouraging and sympathetic/empathetic. The only downside has been the lack of meet ups in real life but that couldn't be helped and in fact, as the classes have been online there's been maybe fewer excuses to miss any! Having said that, I have met some fab people on the course and hope to stay in touch with one or two at least. – Participant 151, female, 64 years old

The course has motivated me to make changes to my lifestyle, small changes but I feel these have made a difference to my outlook on health and wellbeing. I have felt, though, that most of the other participants in the group were more knowledgeable on nutrition and already committed exercisers before starting the course so I was a little out of my depth at times. – Participant 154, female, 79 years old

This has been very useful for me in helping me to schedule health-improving changes into my life at the start of my retirement. It has made me feel the physical benefits of regular exercise, and the mental uplift that results from that, as well as enabling me to meet new friends. I also found the nutritional content very informative and am more motivated to enhance my diet using the new knowledge gained from those aspects of the course. I look forward to firming up my new physical habits and making sure they become regular routine, and joining in the face to face walks and improve my understanding of the nutrition learning so that I can continue to eat more healthily. – Participant 155, male, 66 years old

It's been fun, and has improved my balance. – Participant 140, female, 57 years old

The course has been very interesting. I have learnt a couple of new things. For example how doing balance exercises regularly can improve risk of falls and giving me a better balance. It has been very interesting to follow the exercises Nick showed us and it has helped being part of a group doing them. During the program I found it very interesting to listen to the other participants even though I found Zoom a bit frustrating. I would have liked to be part of a real "in person" physical group but that is not possible during COVID time. I really appreciated the way nutrition was presented and how well Nick understood the importance of it. It was very informative in the email attachments and it was great to finally find someone who has the knowledge and share my concerns about unhealthy food and eating habits. Unfortunately there is so much unhealthy food around that it is very difficult to stick to a balanced diet. (Next step maybe: To target the food industry?) I am not very keen on all these American TED talks. I have watched them in the past and find them very simplistic. They never take a holistic approach to a person's problem. I know it is very difficult to get everything into a 10 weeks course but I would have appreciated it if other countries' contribution to health and nutrition were presented as well. I am biased, I know but Sweden for example has a lot of great informative books about health and nutrition that are worth taking info from. Mindfulness is a subject that I have practiced in the past but in a different way. I like my own way of doing it and as a suggestion I would suggest shortening it. Maybe play some relaxing music as part of it as well? The sessions were on Zoom so it was not possible to meet any of the other participants. Hopefully that will change soon. It seemed like all the others except me and one more were from North London. Maybe try to get people from the same area to attend the same group? All together it has been a positive experience to be part of the group and I would recommend it to anyone who wants to learn more about the subjects. The sad thing is that this kind of info and help never reaches the people that need it most. There are so many elderly people living in poor condition. Many don't speak the language well enough to understand the information and others haven't got the fund to pay for a group like this. Funding needs to come from the government so these kinds of groups can increase and spread free of charge. I, and I think many with me would happily be volunteering in doing a bit to help these people. – Participant 144, female, 64 years old

I've got so much from this course. It encouraged me to start Second Nature, up my step count, i' know loads more about nutrition. – Participant 145, female, 74 years old

Enjoyed being part of the other members of the group. Enjoyed the excercises. And the nutritional advice. – Participant 146, female, 72 years old

This course has been great from start to finish. I've especially valued the exercises Nick has led us through. The discussions have also been very interesting and informative, but I found it quite tricky to engage with these via Zoom - I much prefer talking to people in person! I would like to continue with Walk & Talk online maintenance exercise classes if they are available, but am about to move away from London and so would be unable to attend any in person sessions, which would not be ideal! – Participant 147, female, 68 years old

I started this course at a time when I had already made significant steps towards improving my physical and mental health, including weight loss. I could probably have continued these improvements without the course, but do believe that the conversations within the group and the knowledge and encouragement gained from Nick sustained my efforts. I was

disappointed that something in the exercise classes triggered an old injury and caused pain for a few weeks. This led me to opt out of most of the exercises, but I still learned some tips for movement and balance exercises that I can continue and build into my daily life. The resources and information that Nick provided have been interesting and thought provoking. Sometimes the discussion didn't delve deep enough for my taste, but this is probably a result of the size of the class. Splitting us into small groups for discussion, which was done at least once, worked quite well. I'm quite a busy person, mostly with positive activities of my choice and I am not sure I could commit to ongoing bi-weekly sessions, particularly as I have a low income (below the tax threshold) and need to be cautious about how I spend money. A measure of the success of this course, however, is that I am reluctant to lose contact with Nick and the group. A lesson I am gradually learning (helped by Brene Brown talks!) is that my tendency to be self sufficient is not always helpful. – Participant 137, female, 63 years old

Very helpful to have the support of the group, I think this made a significant difference. Nick was very helpful and sent us lots of info - at times, a little overwhelming but the following discussions in the group helped to resolve this! During the time I have been on this programme, including the control group, I have completed second nature and lost, and kept off, 6 kg- and more importantly, changed a lot of my habits! This was a great base for the Walk and Talk as many of the concepts are familiar. I have also done a cycle training course for 4 weeks that has me back on a bike at 66! I have started swimming again, too and done a 1 day meditation course. So, I think we can safely say that W&T has stimulated me to do other things. Although I had a fall recently from a bike ride, no injuries but glad of the helmet I wore, I do feel a lot fitter and stronger both physically and mentally. It would be great to find the womens' and minority voices in all the advice, TED talks etc
as it is over reliant on white males and we are a group of women, with different bodies, hormones and needs from men. This is more a criticism of the resources and publicity distribution in the health and nutrition field, not a criticism of W&T. However, we all need to pay attention to specific needs in groups and try to be aware of gender and ethnic issues. I have really enjoyed W&T and think it should be recommended to anyone when they reach 50- it will save £££££ on the NHS if we can move to preventive and proactive health. Thankyou for the course and all the benefits it has brought me and others. I do hope to continue and am grateful that you provide this option. – Participant 138, female, 65 years old

I really enjoyed the course and found it generally well balanced. However, Zoom eventually got me down. Nick is an inspiring course leader with a warm personality. However, for me, there wa towards the end there was too much emphasis on vitamins and a level of discussion on esoteric foods and minerals. A lit of people can't afford to buy these products and just need to know what is a balanced diet. Sorry but you asked for honesty. – Participant 139, female, 68 years old

The group was a safe place to talk about some very sensitive subjects, trusting the group and getting acknowledged and supported. I have developed in physical strength in the exercises, however my general health has deteriorated during the course. This has made the group even more significant, as the support to develop tiny habits and mindfulness will support me during my journey towards treatment. The 6 pillars of healthy living were well described, and supporting material was great. Nick, I really admire your passion for raising the bar for us, giving us great material to explore our options. We watched YouTube videos, you even filmed yourself making a typical breakfast. Your materials are colourful, easy to read and straightforward, though in the case of supplements, quite complex. Some things cannot be simplified. I think zoom brought us together, and because we are in our own homes, the

lessons on increasing vegetable variety and choice of oils came home in a visceral way. The course built up in a coherent way that gave me the skills to try new things, for example I practised balance, and I have improved considerably in my balance. In my everyday activities, I try to balance on one leg when I would not have had the confidence before. I used to fall, and now I have the strength in one leg, just need to work on the other! – Participant 148, female, 58 years old

I generally looked forward to the course, although missed quite a few, due to other life commitments. The exercises were good and useful, but I found the discussions the most stimulating. I didn't agree with all the people in the group, but was interested to hear their views and was impressed by the bravery of some (e.g. the woman who had had a stroke) and enjoyed the humour of others. – Participant 149, female, 69 years old

The course was a great impact on my physical rehabilitation as there was encouragement participating with others and the way the exercises were presented made them easy to follow and able to perform. Cheers and encouragement from the leader of the group (Nick) helped us to keep going. The exercises were easy to remember and do at a time when I was not in class as well. Being connected on the WhatApp walk was exciting as we travelled together and shared ideas about our learnings in class. I was able to focus and make changes in my diet with ideas that were presented and the data provided to educate on these changes. It also encouraged the group to share recipes and ideas of things they have tried. The mental health focus on mindfulness was excellent as I was able to develop and move forward with my personal growth in these areas, specifically gratitude and meditation. Changing habits was also great as stacking habits really works for me and I have been able to develop new habits around my exercise routine by fitting in ie standing on one leg for balance while making a cup of tea perhaps, extra squats in the loo for example... Being part of the zoom group was excellent for a social connection as since having a stroke I do not go out for social activities, and also due to lockdown. I looked forward each week for the class and having an email with handouts and activities to complete gave focus in a healthy way learning new things being able to discuss these subjects openly in the sessions was helpful. From a health and well being point of view, I am grateful to have been with this Walk and Talk group. It has been paramount for me as there was not any other source that I have been involved with since my stroke to enhance well-rounded support to improve all of these areas covered. To me, it has been a holistic view that encourages one to make change with the knowledge and information that is presented in a healthy way. Basically, you are presented with ideas and able to adapt change in your lifestyle that promotes better health and well being. I am ever so grateful to be able to carry on as well because I think I would feel quite lost or wonder where to start again with my ongoing rehabilitation. – Participant 156, female, 65 years old

I really enjoyed and felt I benefitted from the class; enjoyed the chats, found information on nutrition useful and have incorporated balance exercises into my daily routine. I need to improve on exercises that raise my heart beat. I would love to continue with the maintenance classes. However, as I am not working, the most I can pay per month is £10 if that is possible please. Thank you Nick for making the class interesting, useful and engaging. All the best with your course! – Participant 157, female, 60 years old

This course was so well timed for me. It made me think about self care and taking a staggered approach to improve my habits. This group has exposed me to a great deal of information and access to new approaches. I have so enjoyed meeting the group. As a

result of this programme I am training 5 days a week, got a part job and started a new way of eating. Thanks – Participant 136, female, 56 years old

It is good research is being undertaken in this area & I had the opportunity to participate. Once you get to 50 you are classed as older & begin to be overlooked/not considered or anything to do with health suddenly age creeps in to explain it away. Certainly attitudes to people getting older ate not great. Being part of a group helps when exercizing. A big plus was that it was free & less intimidating online than being in a room of people. Also there was no comparisions to others in the session which helped. It was useful to hear about why vegetable oil is not so good & I am reducing my intake of this as much as possible. Doing the exercizes to the degree of 7/10 was helpful as it encourages more consistency & not to overdo it. I joined the group to help with my balance. Unfortunately during being part of the control group my balance became worse so by the time it came to the 10 week course it was not going to make much difference. As the weeks went past I found it more difficult to do the exercizes, in the end sitting some out due to some of the exercizes inducing pain in my knees, elbow & lower back as soon as I started them. It became rather frustrating. I am not into goal-setting so I found the focus on that uninteresting. I found the information overwhelming about diet & comments such as too much caffine will kill you rather like scaremongering. I did not think it was helpful to make it sound as though bread, pasta, cereal, rice should never be eaten. Of course a few weeks after being told coffee & oats were bad then in the news we are told they have benefits. The usual story of contradictions. I felt it became pressurized & found myself thinking 'cannot eat this, should not eat that' which defeats the purpose. So now I shall stop focusing on food so I can relax & enjoy what I am eating, instead of being preoccupied about food in a negative way. Perhaps other people came into it for different reasons to me so they have got a lot more out of it. Good luck with writing up the results! – Participant 165, female, 57 years old

This class came at the right time for me in my life. I had experienced an acute episode in March and ended up in hospital. The class motivated me into getting up and doing something with my life. Life hasn't been easy for me especially during lockdown and living on my own. I found the class educational, thought provoking and I enjoyed the interaction with other people. I enjoyed the exercise and the mindfulness sessions too. I would love to carry on and attend the maintenance classes. – Participant 175, female, 59 years old

Appendix 8 – Control Group Emails

Email 1: Week 2
Nutrition
Good morning everyone!

I hope you all have been keeping well given the circumstances. Today, I wanted to give you all a bit more information on nutrition for older adults. To cut a long and complicated argument short, before you eat something, ask yourself:

Would my great grandparents have recognised this food?

If they would recognise the food, it's likely a healthy option, if not, it's likely unhealthy. This means avoiding the processed, packaged, sugary foods and drinks devoid of the essential nutrients, vitamins, minerals, protein, and even fat that you need as you get older. It even

means cutting out the fats and oils invented in the not too distant past such as margarine and vegetable oils and adding back the olive oils, butter, and other cooking oils popular in the time when your great grandparents were alive.

Fortunately, to help explain the reasoning behind this, the NHS has recently partnered with a company called 'Second Nature' who has an incredible track record of helping people lose weight, lower their blood sugar levels, and improve their health. I can't recommend them enough and while their 3-month course is £40 per month some folks may be able to qualify for free through their GP.

Link to their website --> https://www.secondnature.io

Even if you're not interested in joining their programme, they have loads of great articles and resources that help cut through the confusion when it comes to weight loss and nutrition.

Check them out today :)

To your health,
Nick

Email 2: Week 4
Movement
Good afternoon everyone!

I hope everyone was able to withstand the snow and cold weather over the past few weeks.

I wanted to message again with a more comprehensive list of (mostly free) online exercise classes and activities recommended by some of you and other Walk+Talk participants. I have attached the list for your reference.

When it comes to movement try to include the 3W's. Those of #1 **W**alk, #2 **W**eight/**W**ait, and #3 **W**obble. A good movement routine includes:

#1 Some sort of cardio exercise routine such as daily walks, stepping in place, swimming, rowing etc.. to elevate your heart rate and get your blood flowing (**W**alk)

#2 Build muscle by doing bodyweight and other strength training exercises (**W**eight) ideally twice per week but remember to take it at your own pace, slow and steady (**W**ait)

#3 Incorporate balance exercises that challenge you to '**W**obble' at least twice per week. And as a bonus before and after a walk add in some stretching exercises to help improve flexibility.

For more information on all things movement and a list of great exercises check out: VersusArthritis.org and the NHS website for their 5-week exercise programme called Strength and Flex that you can check out here.

Finally, I wanted to confirm that there will be a Walk+Talk course that you will be able to attend and we hope to start that course at the end of April. It is a small way in which I can

thank you for your participation in this study. Your participation is highly valued and appreciated and I look forward to having you participate in our next course. I'll send more information on the times and days available for that course in the upcoming weeks.

In the meantime, however, check out one of the attached online classes or activities!

To your health,
Nick

Email 3: Week 6
Sleep and Stress
Good afternoon everyone,

I hope you all have been doing well!

I wanted to send out one final email with information to help support your health.

Diet and exercise tend to receive the glitz and glamour as the lifestyle factors that improve health, but sleep and managing stress are just as important and are often overlooked. Older adults sadly think that poor sleep is just part of the ageing process. Or that stress and age-related anxiety are normal and so should go left untreated. This is where a shift in perspective is needed because sleep and stress contribute greatly to our food choices and motivation to exercise.

If you wake up groggy and under slept, how likely are you to go out for a morning walk? If you're stressed and anxious what type of foods are you keen to have?

There are loads of tips and techniques to begin including in our daily lives to support our sleep and reduce stress and I have attached a list of tips on each topic. Choose one tip or technique to follow over the next two weeks. For example, why not try a 2-week no phone in the bedroom challenge. Or begin a self-reflection practice, where before bed you take some time to reflect on the day's events, finding something you were grateful for as a way to help you wind down each night.

Lastly, many of you have expressed interest in joining our next 10-week course, which will begin 26 April. I will include the available times and days for this course on a survey that I will send out to you during the first week of April.

If you have any questions, don't hesitate to reach out!

Wishing you all a relaxed and sleep filled week :)

To your health,
Nick

Email 4: Week 8
Behaviour Change
Good afternoon everyone!

I hope you have been keeping well.

Today, instead of talking about health, let's take action with 3 steps to create healthy changes in our life.

1. Tiny Challenges: Try adding in one challenge or tiny habit into your lifestyle every few weeks to make 1% improvements to your health. How about a 2-week 'no phone in the bedroom' challenge to see if your sleep improves? Or try low-carb Mondays for a month. Why not create a social habit where you phone a friend every Sunday at 7:30pm? Little steps like this soon add up.

2. Habit Stack: Add a tiny habit onto an existing activity. For example, associate flipping the switch of your kettle with balancing on one foot until the water boils. Other examples include:

> "After I flush the toilet, I will do 2 knee bends (or full squats)"
> "As I am brushing my teeth, I will tell myself "I'm freaking awesome" (or insert your personal feel-good mantra)"
> "Before I eat breakfast, I will think of one thing I am grateful for"

3. Try, Tweak, Repeat: Behaviour change of any kind is incredibly hard, so start tiny with behaviours that don't take too much motivation and customise the concepts above to fit your lifestyle. Your health is largely the sum of your habits. So, take it tiny and allow those 1% improvements to compound over time.

Lastly, as mentioned in my last email, Walk+Talk's next 10-week course will begin on **26 April** and you have the top priority to join! Generally speaking, classes will be held in the afternoons on weekdays, but I will send out a questionnaire for you to complete at the beginning of April to choose your preferred time and days from a list of options.

But no need to wait until the end of April to begin making healthy behaviour changes. Try the above tips and come up with 1 tiny habit to try out over the next 2-weeks!

Thank you as always for your continued participation with our study and wishing you all the best!

To your health,
Nick

Email 5: Week 10
Recap and Review

Good afternoon everyone,

I hope you all have been doing well!

I wanted to send out one final email with information to help support your health.

Diet and exercise tend to receive the glitz and glamour as the lifestyle factors that improve health, but sleep and managing stress are just as important and are often overlooked. Older adults sadly think that poor sleep is just part of the ageing process. Or that stress and age-related anxiety are normal and so should go left untreated. This is where a shift in perspective is needed because sleep and stress contribute greatly to our food choices and motivation to exercise.

If you wake up groggy and under slept, how likely are you to go out for a morning walk? If you're stressed and anxious what type of foods are you keen to have?

There are loads of tips and techniques to begin including in our daily lives to support our sleep and reduce stress and I have attached a list of tips on each topic. Choose one tip or technique to follow over the next two weeks. For example, why not try a 2-week no phone in the bedroom challenge. Or begin a self-reflection practice, where before bed you take some time to reflect on the day's events, finding something you were grateful for as a way to help you wind down each night.

Lastly, many of you have expressed interest in joining our next 10-week course, which will begin 26 April. I will include the available times and days for this course on a survey that I will send out to you during the first week of April.

If you have any questions, don't hesitate to reach out!

Wishing you all a relaxed and sleep filled week :)

To your health,
Nick

Appendix 9 – Study 2 Qualitative Interview Prompts

The first five qualitative interviews acted as trial and practice for the researcher and used the prompts below:

1. Tell, me how did you get on with lockdown?

2. What did you think of the Walk and Talk programme?

3. What are your views on exercising online?

5. I'm really interested in loneliness, what are your views on the subject?

6. We have covered a lot, and you have provided in-depth feedback. Is there anything else you would like to add?

Interviews 6-20 used the revised prompts below:

1. What led up to you joining the course?

2. Tell me how did you get on with lockdown? And doing exercise how did that

3. I'm looking at different people's views of social connection. I'd be interested to know what your views are.

4. How have you been feeling about your future?

5. 'Is there anything I haven't covered that you'd like to add?

Appendix 10 – Study 2 Qualitative Data

Nicholas Bender
Well, so good to see you. Good to see you too. Yeah, yeah.

Participant 35
Well I nearly saw you eight o'clock?

Nicholas Bender
Yeah, well, just to give you a bit of background, you know if you're familiar, but kind of unlike the survey, this is going to be more open ended questions. And I might be a bit more silent, the normal trying to bite my tongue. I'm learning some lessons actually, from these. But it's really like, it's hoping to give you the opportunity to, to just expand on any of the areas of you know, that you wanted to expand on within the survey or just more in general, just trying to make them open ended questions rather than closed ended questions. So instead of like, yes, no, maybe kind of, you know, answers to give you you're just able to just go on and explain, you know, whatever it is that you need to. I'm just trying to keep it vague essentially, is sort of my my role in my job, but yeah, expect the call to be about 30 minutes. But yes, of course, thanks so much for agreeing to, to hop on a call. But yeah, just the kind of the first question is just about how you've been getting on with lockdown and how lockdown sort of that experience has been for you?

Participant 35
Um, it was particularly I think, the second long lockdown of the sort of three lockdowns really was really quite painful for me. I found it really difficult, the weather didn't encourage you to go out and yeah, I think I did. I didn't sort of appreciate it. I knew I was low in spirit, but I think I was on the verge of getting quite depressed at one point. Um, you know, it just seemed every little negative thing that, that, that, that was coming up. And some of them were big, but it seemed as I was noticing those and none of the none of the positive things like I was still able, you know, to keep in contact with my grandchild via video and that sort of thing. But no before, before I joined the walk and talk, I think I was on a downward spiral to be honest, not that I noticed it as much as I now realise.

Nicholas Bender
Yeah, yeah, interesting, like, so that that second lockdown, you're saying that's kind of from what the Christmas time onward?

Participant 35
Yeah, yeah, yeah, yeah, well, um, we sort of came out didn't we for a little while and then we went back in, in the November. And I just felt that the goodwill that had been around, that had been all for the first one and much more fearful because we didn't know anything about COVID and there were lots more people dying. So there were lots of things that there was this sort of, is like the old war spirit, really, it was it was quite weird in the first thing that there was a sense of community. I felt that although I didn't know the people in the road very

well, they were being very positive and.. ever so sorry my doorbell. Sorry about that.. So I was saying there was a sort of sense of community and perhaps something will become better, but which society would start organising things the things that are important or how important our health was, how important it was to support each other and how just little neighbourly things were, were so good just little acts of kindness could make such a difference. But I felt in a second one that had gone a bit people were a bit more weary and, but also, it didn't seem that we were going to get closer together. It seemed actually that that dividing well, very much dividing the people that have suffered most the poorer people and and the other people, there was more a sense of division. Yeah, so and also personally, it was much more difficult to get out because of the weather and things that that didn't have that uplifting thing that was just winter, we were going to go through Christmas came and went really quickly. And then it was all bad news wasn't it, that the virus was setting off again and you thought there was no escape. So, and I think that was affecting my health sort of mentally and physically, that, you know, I was starting to sort of shrink into the self sit around and not do much and, and, yeah, get depressed.

Nicholas Bender
Well you mentioned the community and you mentioned that word. Just kind of wondering what that did that, you know, that sense of community.. how did that sort of change then maybe? Or how did that be impacted? in that second lockdown, or has it kind of returned?

Participant 35
Umm its returns, returned a little bit more since the lockdown's been lifted. But I think everybody and turned very much in on themselves and their own resources. I mean, the.. people were just more annoyed, they were just angry and I think lots of them were upset as well. Fear makes you shrink into yourself and just guard against others, you know that.. there's been a hundred and one messages on the local thing though, and they're all about scams. They're all about, you know, oh, beware this someone's trying to scam this. This is a scam, the post offices, you know, there's a post office scam, there's this scam. That's a sort of sense of fear, I think. But since you've been able to meet up and talk to people and compare things and so you don't feel that you're so much alone with it, I think that fear's dissipating, and people are being more open and meeting up and things. Yeah, yeah, so I just I just think the social contact missing the social contact and just just just about everyday things, you know, to be big things and that's one of the things that we got from the walk and talk I think was the, the the social just socialising chitty chat, just knocking on the door standing back to say, here's your prescription I've collected for you and then running away which which, which is what it was, oh here's your groceries, you know, stand back. So you felt a bit like an object or almost like you're incarcerated, I suppose. Must be, you know, having your food delivered at the door and no time for chitchat and dangerous for chit chat things. Yeah, it's, yeah.

Nicholas Bender
Well, you're saying that chit chat and you're saying kind of the the lack of social contact. I'm wondering when it comes to the online chit chat, you know, versus an in person chit chat if there's, you know, if there's a difference to you?

Participant 35
There is there is and there is a difference and, and there is more a sense of in person, that you get more out of it, it feels more comforting, more.. or funny as well. You know, I .. umm because for a long time, I couldn't remember when I had laughed and one of the times it was

it was on Walk and Talk and I suddenly realised, gosh, yes, I miss that. And I think that's contagious in a group more contagious in a group if you're, if you're together in person, you know, because it's sort of infectious. And it can, it can spread around laughter and things and and I do remember laughing on Walk and Talk and thinking, oh, yeah, you know, that is so good just to sort of share a joke with people and and that was that was really good, but it obviously, at the time, I didn't think, oh, there's a difference. But I'm pretty sure there is or what I'd almost prefer to meet people personally and that's why I've sort of instigated really the group meeting up later on, to meet face to face. It's been amazing they've all said, oh, yes really wants to meet you in the flesh. It's one of the comments about meeting people in the flesh even if we might have to still be wary about, you know, hugging or things like that and we might still have to wear a mask before our I think it'll be okay. But yeah, yeah, that the difference of quality, but it's still very good to have at least that contact and, and, and meet new people I think as well, it's important to meet people that you don't already have history with because that brings simulation, you know, new ideas, new things into your life as well whereas when out of locked down, I'm sort of getting that by chatting to someone on the bus, or, you know, as I walk through the park, someone will talk and things, you know, an incident will happen, you know, a dog will run out and do something silly and so you chat to someone or you'll see... I mean, yesterday there was a man with a really old dog that was still swaggering up the road and I'm not really a doggy person, but I said to him, oh, you know, really like your dog, he's got attitude and laughing and talking. And in fact, it was a female do, what's the dog? So you know that, so that sort of thing and just he chatted on about how long he had it and, and sort of caring for it and things, and yeah, it was... That sort of thing is important as well. Just sort of being whats the.. part of part of society, really, rather than an individual, away from everything. Yeah, yeah, I don't think I said that very clearly, but I hope you've got the point.

Nicholas Bender
I mean, was the, was the group giving you that kind of feeling? Or was it the in-person kind of meetups that you're you're doing, when it comes to that feeling of connection, or whatever you would describe it as?

Participant 35
The group was doing that, yeah in lockdown and I mean, I think I was pretty good at, you know, making sure I attended, it would only be if I had a hospital appointment, or was meeting someone for the first, you know, my daughter, or something was coming over or was taking me to an appointment or something that where I couldn't get back in time, but that I missed any of them. So yeah, it was being part of that group, did give some of that social feedback, some of that connection, sense of connection.

Nicholas Bender
Yeah, great. Well, I'm just kind of also wondering, what you thought about exercising online?

Participant 35
Yeah, I quite, I quite liked the.. and still, I go to some of the YouTube things you recommended. And, you know, if I haven't got out, or the weather has been that bad, I do do that, some that walking thing and some of the things and yeah, as a, as a substitute for, it's just like being out in the open air feels like better exercise then being indoors. Also, doing it with people live feels better than doing indoors on your own, but I did think it was nice doing it with a group where you could, it wasn't a competition, you know, sometimes sometimes actually, in real life, you feel you're competing with people that, you know, are much better

more agile than you and that can be off putting, whereas online, I felt we were all sort of equals struggling, not the athletic types, you know, that the types that normally went to the gym and things and that was good, because that was a sort of team spirit built up, yeah. And also we were honest about oh when really we'd rather not do it, but you know, just needed that push and I do miss that actually. I'd still like to have still like to be doing one one class a week of that sort of just more physical exercise online, rather than just walking and things which is what I tend to do. I haven't.. I think the gyms and things have opened but I've never been a gym person, but I liked that, that sort of class. And I would be part of the maintenance class, I was keen on starting that but I just thought with the time, the time and two times a week. I really need to keep on my Pilates, which I know is for specific problems with my back and things like that specific, but for something more energising and to keep up the energy levels, yeah. I thought that the exercises were great and I still do a little bit of boxing on the telly, yeah.

Nicholas Bender
Brilliant, yeah and just, I guess, when it comes to that, with your health, you know, how has that been? I think we talked to it a bit earlier about your mental health, maybe physical health, and just kind of have a general understanding of how that's been going over the past few months?

Participant 35
Um, it was very good, I think during the, because I was becoming more aware. I think the other thing, and also was, did, I don't know whether I made the time or had more time, to do the exercising and things. I did, I mean, I certainly built up some muscles, which were much needed in my legs and things, and certainly my posture and things, holding myself straighter and things. And certainly, I'm going to keep on doing the stuff that gives support to my knees to getting up and sitting down. But I feel since lockdown has been easing, I've not I've made the time or had the time to keep that up. So I'm a little bit worried about it slipping, but I'm, I'm trying not to let it slip. But I think I think the other thing is I'm not eating so some healthily as I was when we were locked down, because you know, suddenly, I've been to, I've been up to see my sister, been drinking more and eating, eating more. My nephew opened a restaurant hotel and restaurant up in Norfolk and I was at the opening night of that. So yeah, I'm feeling a bit at the moment, because I've had a couple of days off the waggon in, in the eating sense, but I'm a lot more aware now. I mean, I'm reading packages a lot more to see what's in them, certainly aware of all this, all the preservatives and things that go in and this super processed type food and trying to be aware that it's affected my shopping and things like that. So I think, in my fridge, I'm healthier, but it's just if I go out now, because it's such a pleasure and fantastically new to go out for a meal outside, that I'm not doing so well there. But generally, I think over the period of the second knockdown, I did sort of bite down and, and felt I had a lot more energy than I've had for a long time. Certainly, in November, you know, I had no energy for anything, and yet I wasn't sleeping very well either. But I was going to bed at.. really tired, getting up feeling really tired, feeling oh, you know, it's too much effort, aches and pains and things. But yeah, and um, you know, considering all my problems with my back and everything I'm doing really well.

Nicholas Bender
Yeah, it seems like it seems like that, you know, I've just tried to think of during that lockdown period, what factors do you think were contributors to those changes?

Participant 35

I think they Walk and Talk to be honest, I think that was a big, big thing because it, it gave me things and I really liked but they're all the follow ups to things because learn, got tips from some of the women in the group got all the great feedback from you afterwards, you know, with the follow up, it wasn't just that you'd talk about something, you'd say oh, yes, you know, there is this doctor, there is this view, there is this paper on something, but then we get a copy of the paper so there was sort of follow up from that. And so it felt that.. And I like to think I'm learning as well. I think that's, that's that's a good thing for me, so this is sort of a learning process, it was a fitness process and it was a mental health process and it was also a dietary process and sleeping. I mean your five pillars, really the sleeping, that the being conscious that when you're tired.. I think particularly about not watching television too late, particularly things that raise your anxieties, the whole thing about blocking out the blue light. That's the important thing, I think I am sleeping better. I'm definitely sleeping, getting more deep sleep, and I was getting getting before. So I don't I don't wake up feeling like I still need to sleep. But although I've been up since seven o'clock this morning, I wasn't, I wasn't sort of I didn't have to drag myself out of bed like I used to. Yeah, so I think I haven't really answered your question. I think there were several aspects from the Walk and Talk that were definitely beneficial. Obviously, my Pilates was good, because that was a connection with people that I had met in the flesh, but didn't really know that, well, I don't think I know the people as well in my Pilates class, or have felt that connection with people in my Pilates class and I've been going there for about 10 years, as I did with the people, I miss the people, in the Walk and Talk group, which is, which is strange, isn't it? Where I didn't miss, but it was very nice to have contact with people that I've met in the flesh through the Pilates online. So that helped me through, I think. When gradually I started seeing my grandchild that helped me through, and a couple of friends that I was able to go walking on. So the walking element of the Walk and Talk was also coupled with an impetus to contact people to say do you want to go for a walk, you know, for me, because I actually started wanting to go for a walk, not just going for a walk, because it was good for me or because I needed to get something from A or B. I'd always been more a walker, a walker for a purpose, not not just to enjoy walking. I think that's changed as well.

Nicholas Bender
Amazing, is that is that, again, the kind of factors behind that? Is that the walking challenges or what would maybe leading you to walking more?

Participant 35
I think the walking challenges were were an important part. I I don't I didn't think I didn't really get into the competitive side. When I walked long distance it was just because that that's nice to do. But I think it the competitive side did help me doing it regularly. Like I'm still averaging about well I'm still doing 10,000 steps a day, but I think it's partly time and partly not that impetus that I don't want to let the group down. Partly that impetus, but partly it's it's that I've got some you know, like, I'm going back to the cinema, I'm going to the cinema this afternoon. So that curtails me going for a very long walk, but I might walk to the cinema. But I won't be going on I won't have time for 20 or the 10k walk or a really long walk, you know, that takes four hours or something to walk there and back. I won't have time today to do that. So it's partly because we're opening up a bit, but I do think partly the impetus, you know, to and also hearing where other people have walked was interesting because that, that made me think oh yeah, when this is all over, perhaps I can go over to North London, go around Richmond Park and go around Hamstead Health and things like that, yeah.

Nicholas Bender
Yeah, cool. Well, I am really looking into or I'm interested in people's views on loneliness. And I was just wondering what your views are on that subject?

Participant 35
It's very painful, I mean, with the word loneliness. It's felt, it did, does affect your confidence. It's and it is very difficult, I think if you're on on your own to battle with it, because that's what loneliness is, isn't it, is being on your own or feeling you're on your own and not feeling worthy enough of reaching out. So I think if you've got something where that, that you've got this contact with people, where you don't have to risk so much in saying well I'm reaching out to you because I'm lonely, but you've got this group of people that you can join, it's less threatening and also, you're more motivated to do it because you're not, you're not, it's not such a risk. It's, it's, it feels when you're lonely, that well, why would people, why would people want to go for a walk with me? Why, why would they want to speak to me when they've probably got busy nights and things. And it's, and it's, you know sort of deep inside, it's ridiculous but if you phone someone and they say, oh I'm ever so busy at the moment, can I find you back? But that's perfectly reasonable and perfectly, you know, explainable that people are busy, but it cuts you a bit and makes you feel oh, my God, you know, I shouldn't have done it. And oh, you know, they're obviously too busy, they didn't, you know, and yeah, it's, it's, it's having been there, as I mentioned, the word loneliness, it connects me to it and that feeling. And I'm sorry, I didn't realise it was so much to the surface. Yeah, loneliness, that sense of that, there's no one that you can talk to, there's noone. You yourself, in the end, don't feel that you're worthwhile talking to. And I mean, I think in the first couple of sessions, I was probably quite quiet wasn't I, in the first couple of Walk and Talks. I think I think I, I would have answered questions, but I don't think I've volunteered much the first sessions, I think are was was sort of. Yeah. And became more bold as things went on. Yeah gosh..

Nicholas Bender
Are there any, and again kind of any factors why you were starting to kind of think through and in making more attempts to, to answer questions or to become more involved?

Participant 35
Yeah, I mean, I think now, I suppose, it's made me think of, perhaps slightly different ways that I was always.. Before lockdown I had my social network there and could feel my talk.. could fill my time with that. But actually, it was quite limiting in a way. So I think I am going to join more things once that once they get going back, I think I am going to join more different things. I'm sorry, I've lost the question.

Nicholas Bender
Oh, you know, when it comes to that experience, you were saying that the beginning of the classes, you know, you weren't as I don't know, what's the word open, maybe? And then you are more likely to then chime in with your opinions and things like that. And what were some of the factors maybe that you could identify maybe within the course that or within the other group, or the people in the other classes like the other people in the class. Any types of factors that would have led you to becoming more open?

Participant 35
I think is the facil, the facilitating at the group enables that. Asking questions and asking cross questions, so that people were asking me questions so that involved you and you sort of thought, oh, it's not just Nick wanting my opinion, because he has to get the opinion of

everybody in the class. But, you know, the other people are interested and then sort of actually then relaxing so I could become interested in what the other people were saying and what their lives were like and how we did have shared experiences. You know that, because I'm a little bit disappointed that most of the people were North London, and you know that's not really a barrier is it is it's.. and thinking, oh, well, that's it, I'm not going to actually make friends with any of these people and it doesn't have to be a lifetime time thing does it? And, yeah, and it's just, you know, I am interested in people genuinely are interested in people. I suppose it was a sort of shock, that I think I have always been outgoing, so it's a bit of a shock, how lockdown has affected me. And how.. how the group helped stimulate those those things of interest in other people, and what was going on in their lives. And also, not thinking too, because to be honest, I had it easy compared to lots of people. I don't mean, just within the group, but anywhere and valuing.. yeah. I mean, you have the sanitation of the good things and appreciating the good, the good things and that was a good point for me as well. And yeah, and yeah, I think the way the group was organised so that we did have this talk session, it wasn't just fitness, we had this talk session. And that was also given as much weight but really, as being part of the whole health thing, really helped and allowed you to.. well, yeah, it gave more impetus, I think, to be more social, and to give away a bit more and chance of the things, yeah. And I think certainly people were very generous to me and did make me feel included. But I think that that had to be because that atmosphere was set up for us. So yeah, I mean, and let's face it, I would have never ever met those people, if it wasn't for the group.

Nicholas Bender
Yeah, the atmosphere, I'm just, that's something that maybe somebody hasn't touched on for.. Yeah just wondering if you could expand on that atmosphere and maybe kind of trying to explain that a bit more.

Participant 35
It's, it's a much like, you know, encouraging, but not judging. So it was this encouraging, yeah, come on, you can do it, you know, let's have a, let's you and so and so fight, you know Juliet you have a go and come on, yeah, we can all we can all do it, it's all for getting fit. Just goes to the extent that you feel you can go this 7 out of 10. I really like that, I thought that that, you know, because there were some things that we were doing that I thought, oh, I don't want to push that, you know. In because in my Pilates class, I I pushed myself and ended up on my back for a long time. So that was just, you know, keeping it measured, and feeling that although it was good for us and exercise, it could also be fun. And yeah the non competitive, I mean, the whole competitiveness about the, it was a joke, wasn't it, I mean, there were lots of jokes and sort of, and that made us feel team like, but also it didn't get so that it was you know, there are people really telling other people off because they hadn't been out and walked or anything. It was just a general spirit and understanding that for some, sometimes it's tough and so you could also talk about that. So, yes, it was a go.. And you being very, I suppose, humble about your own ability, you know, you're saying, oh, I find this tough or I'm pretty tired after doing three sessions today. Not, you know, not being.. very accepting and understanding that people of our age, you know, well, what we're trying to do is just keep healthier for longer. We're not trying to become Mr. and Mrs. Atlas or anything like that. Yeah, so yes, it was the whole atmosphere of the group and the way it was set up and facilitated, that really comes back to the, the social conversation was very well facilitated the getting to know you, but also giving information and not shoving it down your throat and that becoming rules, I think there was a lot of information given in a non, you know, it wasn't in a non lecturey way. And just, you know, honesty and or what have you found helpful or, have

you heard anything about that, or what's your views on that, that of.. some of the information that you sent us and some of the information then that we could talk about. And, yeah, accept accepting, as I felt as a group, we were very accepting that we were all on this learning curve together. And some of us were at different points and some of us had different points that we started on. And some of us had different points of ability to go further. And it didn't really matter where we ended up just as long as as as we got what we needed from it.

Nicholas Bender
Brilliant. Yeah, I think the really the last question here is just a bit on how you've been feeling about your future?

Participant 35
Brighter, brighter, I do think I do. I think No, I, I think in lockdown in the darkest points about all I could see in my future was me sitting out huddled on the settee watching the television, and quite a lot of pain waiting to die to be, you know, the real real low spot. And now I feel that, although I still think we're gonna have difficult times ahead, I don't think COVID is gone. I think that, where it's a shame, we can't travel, things like that. I still do think, you know, there's things like going out and meeting new people that I can still keep my health up. And as long as I can walk and go out and about and get to places, I'm so lucky, really. And you know, things aren't as safe and go back to the cinema. I can meet my friends for that the transport situation opening up is really great, you know, to use that more to travel further afield. And to discover England. Yeah, lots of places. I haven't been in England as well. Yeah, I think. I think it's there. So I feel a lot more positive about things that I can do and I can get out and about and a lot less old. Which is stupid, because you haven't changed my age, but I was feeling an old lady. And I think you know, I may actually own I know, certainly, if there is another lockdown. I'll be on to you saying, Hey, could I join in the maintenance class? I just think it's if I commit to something, I feel I want to commit? No, I can't. And I knew that I was going to have to miss first three Thursdays and wouldn't be able to make them up on the Saturdays and and and that's my thought, Well, no, it's not really fair because the group would be jelling and things I want to do new things and I want to as it opens up, I want to take advantage of that just in case was slammed down quickly. But I know I will be if your classes aren't available, then I will be looking for something else like that because I do think it was a life.. I do honestly think it was a lifesaver during that second lockdown for me.

Nicholas Bender
We're glad glad to hear that. And those you know those factors again with when it comes to those feelings of optimism. How would you describe those factors? Um, what what might those factors have been? For you feeling brighter?

Participant 35
I think it was because there were there were exercises I could do which will improve, how I can still improve my health through exercise. You know, because I always been told, well no impact, you know, no, don't run, you can't do this, you can't do that. But there were exercises that were tailored, that that could be fun. Because I could never go into gym and sit and pull weights or anything like that. And so there was that there was that, yes, I can still meet new people and build connections with them. But you know, I'm not just this old lady that everybody walks past. So there was that. And I can reach out to people and try it. And it's not the end of world if, actually, it's that, no, they're too busy, or they've got other things that they want to do. It's not a rejection. I think the whole thing about yeah, you ought to be thinking

about your health more, and you can add to it by your diet, as well, because I'd always been, like another member of the group, I'd always been just looking at diets to lose weight, not so much for my health. And I'm not only about supplements, I'm now more regularly taking those, I'm drinking more water. And that that that gives you optimism because you do if you feel that you're actually an agent, in keeping your health out, that's a lot more positive than, you know, the doctor giving you a tablet, isn't it? Where you're sort of reliant on the tablets. But you know, I can build up my bone strength. By doing things, as well as taking the osteoporosis pill I'm taking. I can keep my weight off by walking more. And I can help my eyesight and various things by eating more healthfully by sleeping better. So there's, there's much more optimism, isn't there, in life, if you feel you, you yourself can do things to increase that and make you feel better. And so there's more purpose to it, yeah. Yeah, I mean, I want to be as healthy as I can, because I want to be able to play with my grandchild and not to be groaning and saying, oh, could you just watch the television? Because none is too tired. So, yeah,

Nicholas Bender
yeah, that purpose in a moment as well, when we talked about that in class. I don't know if he had anything else that you wanted to cover? Or maybe, you know, you expect, I would have asked, you know, any, any kind of questions there that you wouldn't want to, would have wanted to answer.

Participant 35
I can't think so. I mean, obviously, I think the success of it in a lot of ways did depend on the personality and the skills of the person that was leading it. So I do think that was down to you. Those sorts of groups do need to be managed quite well and, you know, you're young, very physically fit person and I could imagine, you know, my first impressions for Oh, my God, do we go, you know, but I, you know, committed to do this and I was thinking oh, you know, I have had other groups and things I've been home to where there's been sort of expectations way up here of, of what I'm supposed to do. And yeah, and just sort of felt we're on different wavelengths here. But I think you really did, obviously, you had, you have a lot of knowledge about older people and both their thoughts and motivations as well as, you got to have personality as well, haven't you to do something like that. I can remember when I lectured, I used to become a different. I was used to adopt some of the best lecturers I'd ever had in my life. I used to try and become them as a lecturer. So there's a great deal of skill leading a group like that, I think, particularly, you know, from a group of old women who, who might say, oh, God, yeah, I'm supposed to learn from this young bloke? So I mean, I do think you're terribly skilled, and also great fun. And so you made it fun for us.

Nicholas Bender
Brilliant. Great. Well, that's really all I've got. And I really again, I appreciate donated the input there. Yeah, unless there was anything else I go ahead and stop the recording.

Participant 35
No, I hope I hope you some you know the idea of continuing this type of class continues. So that's one thing I'd like to say. And I wish you good luck in the future. All right brilliant. While the stop the recording

Appendix 11 – Study 3 Final Survey

What is your first name?

What is your email address?

How do you feel your balance has changed in the past 10 weeks, since the start of the of the Walk + Talk course, which began the week of 25 January? (Answers: Declined Significantly, Declined, Neither, Improved, Improved Significantly)

How do you feel your muscle strength has changed in the past 10 weeks, since the start of the course? (Answers: Significantly Weaker, Weaker, Neither, Stronger, Significantly Stronger)

Approximately, how has your bodyweight changed in the past 10 weeks, since the start of the course? (Answers: I have gained a stone or more in bodyweight, I have gained weight but not more than a stone, My bodyweight has remained stable, I have lost weight but not more than a stone, I have lost more than a stone in bodyweight)

List below any and all diagnosed conditions that you currently have or are recovering from.

On a typical day, how many different prescription medications do you take?

How do you feel your chronic condition changed since the start of the Walk + Talk course, which began on 25 January? Answers: Significantly Worse, Worse, Neither, Improved, Significantly Improved, N/A)

Have you had a fall since the start of the course?

Have you sustained an injury related to a Walk + Talk exercise session?

Have you ever received a shielding note or other formal communication saying that you are 'high risk' from coronavirus?

During a typical **7-DAY** period, how many times on average do you do MILD/LIGHT kinds of exercise (e.g. fishing, chair-based yoga, easy walking, etc..) for more than 15 minutes during your free time?

During a typical **7-DAY** period, how many times on average do you do MODERATE kinds of exercise (e.g. brisk walking, tennis, cycling, etc..) for more than 15 minutes during your free time?

During a typical **7-DAY** period, how many times on average do you do STRENUOUS kinds of exercise where your heart beats rapidly for more than 15 minutes during your free time?

On a typical **DAY**, how many servings of fruits and vegetables do you eat (these can be dried, fresh, frozen or tinned; one portion is 80g or about the size as a handful).

Please choose the best answer which represents your general feeling (Answers: Yes, More or Less, No)

I experience a general sense of emptiness.

I miss having people around me.

I often feel rejected.

There are plenty of people I can rely on when I have problems.

There are many people I can trust completely.

There are enough people I feel close to.

Over the last 2 weeks, how often have you been bothered by any of the following problems? (Answers: Not at all, Several Days, Half of the Days, Nearly Every Day)

Little interest or pleasure in doing things?

Feeling down, depressed, or hopeless?

Trouble falling or staying asleep, or sleeping too much?

Feeling tired or having little energy?

Poor appetite or overeating?

Feeling bad about yourself - or that you are a failure or have let yourself or your family down?

Trouble concentrating on things, such as reading the newspaper or watching television?

Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual?

Thoughts that you would be better off dead, or of hurting yourself in some way?

Below are some statements about feelings and thoughts.
Please choose the answer that best describes your experience of each over the last 2 weeks (Answers: None of the Time, Rarely, Some of the Time, Often, All of the Time)

I’ve been feeling optimistic about the future

I’ve been feeling useful

I’ve been feeling relaxed

I’ve been dealing with problems well

I’ve been thinking clearly

I’ve been feeling close to other people

I’ve been able to make up my own mind about things

Over the last 2 weeks, how often have you been bothered by the following problems? (Answers: Not at all, Several Days, Half of the Days, Nearly Every Day)

Feeling nervous, anxious or on edge

Not being able to stop or control worrying

Worrying too much about different things

Trouble relaxing

Being so restless that it is hard to sit still

Becoming easily annoyed or irritable

Feeling afraid as if something awful might happen

Assuming you were available, would you be able and willing to pay a monthly fee of £18.99 (equivalent to £2.11 per session) to continue your participation with weekly Walk + Talk maintenance classes?

What is your preferred availability for continuing once weekly Walk + Talk maintenance classes, which would begin the week of 12 July?

Would you please provide open-ended feedback, as long or as short as you'd like, about your experience with Walk + Talk. Feel free to elaborate about how you feel the course has impacted your physical, mental, and social health. Also feel free to include the parts of the course you enjoyed the most as well as the areas you would like to see improved on moving forward.

You will not be personally identified from any of the answers you have provided. If you would like to submit your answers, then please press the arrow key below, one last time.

Appendix 12
Ethics Approval Letter

25/05/2021

APPLICATION NUMBER: 15199

Dear Nicholas Adam Bender and all collaborators/co-investigators

Re your application title: Walk and Talk Zoom

Supervisor:

Co-investigators/collaborators:

Thank you for submitting your application. I can confirm that your application has been given APPROVAL from the date of this letter by the London Sport Institute REC.

Although your application has been approved, the reviewers of your application may have made some useful comments on your application. Please look at your online application again to check whether the reviewers have added any comments for you to look at.

Also, please note the following:

1. Please ensure that you contact your supervisor/research ethics committee (REC) if any changes are made to the research project which could affect your ethics approval. There is an Amendment sub-form on MORE that can be completed and submitted to your REC for further review.

2. You must notify your supervisor/REC if there is a breach in data protection management or any issues that arise that may lead to a health and safety concern or conflict of interests.

3. If you require more time to complete your research, i.e., beyond the date specified in your application, please complete the Extension sub-form on MORE and submit it your REC for review.

4. Please quote the application number in any correspondence.

5. It is important that you retain this document as evidence of research ethics approval, as it may be required for submission to external bodies (e.g., NHS, grant awarding bodies) or as part of your research report, dissemination (e.g., journal articles) and data management plan.

6. Also, please forward any other information that would be helpful in enhancing our application form and procedures - please contact MOREsupport@mdx.ac.uk to provide feedback.

Good luck with your research. Yours sincerely,

Chairs Dr Rhonda Cohen/ Dr Anne Elliott London Sport Institute REC