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A short report for Essex County Council
The Health Benefits of the ‘Generation’s Growing Together’ (GGT) Community Allotments Project

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About the Authors

The authors of this report form part of the Green Exercise multi-disciplinary team at the University of Essex. The team is leading research analysing the relationship between nature, exercise and health. Team members are engaged in primary research on i) the physiological and psychological health benefits of green exercise (activity in the presence of nature); ii) green care (therapeutic applications of green exercise, care farming, ecotherapy and wilderness therapy) and iii) green education (increasing opportunities for children to have contact with nature and engage in green exercise activities). The research team are independent from ECC who deliver the GGT programme. All authors were involved in the evaluation design and contributed to the writing of this report. The lead author collected the majority of data and conducted all preliminary analyses.

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## Glossary

<table>
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<tr>
<td>ART</td>
<td>Attention Restoration Theory</td>
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<td>DoH</td>
<td>Department of Health</td>
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<td>GGT</td>
<td>Generations Growing Together</td>
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<td>PA</td>
<td>Physical Activity</td>
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<td>PET</td>
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<td>SE</td>
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Executive Summary

The health and well-being of the UK population is suffering as a result of our sedentary lifestyles, poor diets and the increasing prevalence of mental ill health. Achieving good health and well-being is of great importance and requires the adoption of health promoting behaviours. If individuals are physically active, have regular contact with nature, are socially interactive and follow a healthy diet, they will experience an enhanced level of health and well-being.

The aim of the Generations Growing Together programme was to evaluate the health and well-being effects of participating in community allotment projects. Five allotments within the Essex region were invited to participate in the evaluation, which ran from April 2011 to March 2012. All participants had access to the allotments on a weekly basis, although attendance did vary. A mixed methods approach was used to assess changes in emotional well-being, physical activity, nature experience, diet and healthy eating, intergenerational activity, social isolation and community engagement. Internationally standardised instruments were used alongside bespoke questions developed by the University of Essex researchers and qualitative feedback to provide rich narrative. Questionnaires were completed at the start of the programme (April 2011) and six months later (October 2011), just before the allotments closed for winter. Two in-depth case studies were also conducted to obtain further detail about participation in the community allotments and how health and well-being was affected during the winter when the allotment was not available for use. These questionnaires were completed in March 2012, 12 months after the start of the programme.

A total of 57 participants took part in the GGT programme and completed at least one questionnaire. The average age of the participants was 35.9±15.7 years. The majority of participants were male (59.6%) and White British (87.1%). Participants had been attending the allotments for varying periods of time ranging from 1 day to several years.

Participants experienced a 9.8% increase in the well-being index (Figure A) and a 5.6% increase in the nature experience index (Figure B). Indoor physical activity also increased and combined with outdoor activity participants were exceeding government activity recommendations. Time spent sitting decreased implying a reduction in sedentary behaviour.

Figure A: Well-being scores at the start and end of the programme.

There were also increases in neighbourhood belonging and satisfaction, healthy dietary choices, social interaction with friends and relatives, help within communities and opportunities for intergenerational contact.
The benefits received from taking part in the GGT programme did not significantly differ between the different allotment groups or genders, indicating that both males and females who participate in any of the allotment groups will receive the same degree of benefits for health.

Time spent attending the community allotments did significantly affect the community safety and isolation score, with participants who had been attending for the longest and shortest times feeling least isolated and most safe within their communities (Figure C). For well-being, nature experience, diet and social interaction participants who had been attending the allotment for the longest time provided the most positive responses.

Overall, the GGT programme demonstrated that attendance at community allotments helps to enhance well-being and nature experience, provides opportunities for physical activity, and facilitates healthy eating and social interaction and also opportunities for intergenerational activity. Since all of these parameters contribute to overall health and well-being, the results of the evaluation indicate that community allotments can be a useful tool to promote healthy behaviours within communities.

**Key Findings**

- Participants from all allotment groups experienced increases in well-being.
- Nature experience also increased and sitting time decreased.
- Physical activity conducted indoors and outdoors decreased over the course of the programme; however participants were still meeting government activity standards.

![Figure B: Nature experience scores at the start and end of the programme.](image1)

![Figure C: Change in community safety and isolation in those attending the allotments for different time periods.](image2)
recommendations despite this reduction. Furthermore, participants still performed more outdoor activity than indoors by the end of the programme. Outdoor activity may also have been affected by the weather and restricted access to the allotments over the winter period.

- Community belonging, neighbourhood respect and consideration also increased. Participants felt less isolated within their communities, participated in community activities more, felt that they had people in their life that cared about them, met friends and relatives more regularly, and found it easier to meet new people. Thus by the end of the programme a greater proportion of participants were socially interactive.

- Interaction with people of other generations also increased. Participants felt they had greater opportunity to meet other generations through the GGT programme and that this interaction was beneficial for knowledge transferral and sharing of ideas.

- Gender or the allotment group attended did not significantly affect the change in any of the health parameters over the course of the programme.

- There were significant differences at the start of the programme in community safety and isolation scores depending on the length of time participants had been attending the allotment. Those attending for more than 12 months or who had just started attending felt the most safe and least isolated within their communities.

- Time spent attending the allotment did not significantly affect any of the other health data collected at the start of the programme.

- For the two case study participants, at least one of the two sustained improvements in the health parameters six months after the end of the GGT programme. These improvements were also sustained over the winter when the allotments were closed. Participation in community allotment activities may therefore contribute to a sustained improvement in well-being, nature experience, community safety and isolation, social interaction, diet and intergenerational contact in the longer term.

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1. Introduction

1.1 Health and Well-being

The health and well-being of the UK population is suffering as a result of our sedentary lifestyles, poor diets and the increasing prevalence of mental ill health. The term health incorporates physical health, mental health, social and spiritual health, lifestyle and functionality. The World Health Organisation (WHO) define health as ‘a state of complete physical, mental and social (individual) well-being, and not merely the absence of disease or infirmity’[1].

Physical health is concerned with minimising disability and disease and having a sufficient level of fitness to achieve life goals and everyday activities [2]. However, approximately 58% of UK adults have at least one longstanding illness, with 16% having acute illness that prevents them from performing their normal daily activities [3]. Furthermore, 42% and 32% of UK men and women respectively (aged 16 years+) are overweight, whilst 26% of both men and women are obese [4]. Seven percent of UK adults suffer from cardiovascular disease and the associated risk factors such as hypertension and high blood lipids, and 6% suffer from Type II diabetes [3].

Mental or psychological health is defined as ‘a state of well-being whereby individuals recognise their abilities, are able to cope with the normal stresses of life, work productively and fruitfully and make a contribution to their communities’ [5]. Mental health is the foundation for well-being and the effective functioning of individuals and communities [6]. Approximately one in four UK adults experience at least one diagnosable mental health problem in any given year [7]. Mental ill-health can have a substantial effect on quality of life and is a leading cause of disability. By 2020 depression and depression-related illness will be the second most common cause of disability in the developed world [8]. Furthermore, mental ill-health can cause poor self-esteem (SE), low self-confidence and a lack of social skills [9]. Mental ill-health is a major public health problem and was estimated to cost £105.2 billion to the UK economy in 2010 [10]. The understanding of the inter-relationship between physical and mental health has grown considerably in recent years and it is recognised that the status of one considerably affects the other.

Achieving good health and well-being is of great importance and requires the adoption of health promoting behaviours. Figure 1 shows the four key contributors to health and well-being – i) diet; ii) physical activity; iii) contact with nature and iv) social interaction. If individuals are physically active, have regular contact with nature and other people and adopt a healthy well-balanced diet, they will experience an enhanced level of health and well-being [11].

1.1.1 Diet

Poor diet and nutrition are recognised as key risk factors for ill health and premature death [4]. Current recommendations suggest that everyone should achieve energy balance and a healthy weight by limiting energy intake from total fat, increasing consumption of fruit and vegetables and limiting the intake of sugars and salt [12]. Individuals should consume at least five portions of fruit and vegetables and drink 1.2 litres of fluid per day, eat plenty of potatoes, rice and starchy foods,
some milk, dairy products, meat and fish and small and infrequent amounts of food and drink high in salt, fat and sugar [4]. This suggestion is visually represented in the Eatwell Plate below (Figure 2) [13].
Despite the recommendations for a healthy diet, a significant proportion of people consume significantly less than the recommended intake of fibre and fruit and vegetables, but more fat, saturated fat, salt and sugar [14]. Only 25% of UK men and 27% of UK women aged 16 years and above consume the recommended five portions of fruit and vegetables each day [3]. Eating five portions of fruit and vegetables can reduce the risk of death from chronic diseases such as heart disease, stroke and cancer by up to 20% [14]. Furthermore, by increasing fruit and vegetable intake by just one portion a day, the risk of coronary heart disease and stroke are lowered by 4% and 6% respectively. Approximately 22% of cancers can be attributed to poor diet and nutrition [14]. Unhealthy diets have also contributed to the growing prevalence of overweight and obesity and the associated health problems [3]. Obesity is suggested to cause 9,000 premature deaths in the UK each year and the annual treatment of ill-health from poor diet is estimated to cost the National Health Service £4 billion [14]. Many people in the UK have become distanced both from the food that they eat and from those who produce it. A survey reported that 26% of young people under the age of 16 believe bacon comes from sheep and 29% think that oats grow on trees [15].

1.1.2 Social Interaction

Social health is concerned with how an individual interacts, relates and cooperates with other people [2]. Social relationships, support and interaction can be protective against ill-health, whilst social isolation and exclusion are associated with high rates of ill-health [2]. Unfortunately many adults and children are becoming more disconnected from other people and often experience feelings of isolation and loneliness. Social isolation is often associated with a reduced quality of life, depression, low SE and in extreme cases suicide attempts [16]. It is often associated with elderly people, the mentally ill, disabled, impoverished and disaffected members of society and can contribute to a vicious cycle of inequality. Social isolation can also predict mortality and morbidity with a magnitude of risk for health comparable to that of cigarette smoking [17]. Communities whereby there is little social interaction tend to have less trust in each other, feel less safe in their communities and be less involved in community activities [2]. Individuals who live in disadvantaged social circumstances have been suggested to have more illness, greater distress and disability and shorter lives [18]. Social interaction and relationships are thus key to health and well-being, although a causal relationship cannot be implied. Living in disadvantaged social circumstances may cause poor health, but on the other hand those with poor health may have less social interaction as a direct result. However, there is a clear link between social capital and health indicators, and developing social capital both for individuals and for communities can contribute to reducing health inequalities often associated with social exclusion.

1.1.3 Physical Activity

The health benefits of engaging in physical activity (PA) are well-documented. Regular participation in PA reduces the risk of cardiovascular disease and the associated risk factors and can also reduce the likelihood of developing type II diabetes [19, 20]. PA is also beneficial for psychological well-being and has been demonstrated to positively influence SE, mood, anxiety and depression and
enrich quality of life [19, 20]. UK adults are recommended to perform at least 30 minutes of moderate intensity PA on at least five days per week. However, only 40% of men and 28% of women are meeting these guidelines [20].

Physical inactivity is the fourth leading risk factor for global mortality, accounting for 6% of deaths globally [20]. The annual costs of physical inactivity in England are reported to be approximately £8.3 billion per year, excluding those who are overweight or obese due to physical inactivity which costs a further £2.5 billion per year [21]. Worldwide, physical inactivity accounts for 6% of the burden of cardiovascular disease, 7% of type II diabetes, 10% of breast and colon cancer and 9% of premature mortality [22]. People who are physically active reduce their risk of developing major chronic diseases by 50% and the risk of premature death by about 20-30% [19].

1.1.4 Contact with Nature

The relationship between exposure to nature and green space and an individual’s health and well-being is increasingly recognized. The quality and quantity of nature and green space in the surrounding environment can transform a person’s mental health, both at home, at work and at the places they visit [23, 24]. Nature and green spaces are perceived as places to relax, escape and unwind from the daily stresses of modern life, thus having a positive influence on our well-being.

Three key theories offer explanations concerning the human relationship with nature, which all focus on the restorative effects of the natural environment [24, 25]— the Biophilia hypothesis [26]; the Attention Restoration Theory (ART) [27] and the Psycho-evolutionary stress reduction theory (PET) [28]. The ‘Biophilia hypothesis’ suggests an innate evolutionary foundation to the relationship and recognizes the basic human dependence and preference to affiliate with nature [26, 29]. ART focuses on the cognitive changes associated with restoration, while PET argues that restoration is derived from reduction of stress, and acknowledges affective or emotional changes. However, all three theories agree that nature contributes to enhanced well-being, mental development and personal fulfillment [24, 25]. Therefore, in today’s world, where sufferers of mental ill health are more commonplace, nature can act as a vital health resource [24].

Simply viewing a natural environment can positively influence our well-being. Viewing nature through a window can help to increase recovery from mental fatigue and improve mental well-being [30, 31]. Natural views in hospitals help to increase recovery from illness [32], whilst access to nature in the workplace is associated with lower levels of perceived stress and greater job satisfaction [31, 33, 34]. The positive effect of natural ecosystems occurs even if the view is not of living nature; pictures of natural ecosystems can also elicit improvements in mental well-being [34]. The view from the home is also important [35, 36]. Green views can have a positive effect on cognitive function and concentration, whilst also aiding self discipline [36].

Local green space or nearby nature is vital for all individuals, whether the nature is an urban park or an area of remote rural wild lands [34]. Being in the presence of nearby nature, whether or not it is incidental to some other activity such as walking to work or sitting on a bench, plays an important role in human well-being [34, 37]. Research suggests that there is a link between the amount of
accessible green space and psychological well-being [38, 39], as nearby nature can help individuals to recover from stress, protect them from further stress and improve concentration [34, 40]. Furthermore, the more frequent the visits to nearby natural spaces, the lower the incidence of stress [41]. In health care settings, gardens are of particular importance to mental well-being [42]. Gardens in hospitals have a number of positive effects on individuals, by helping them to feel more relaxed and able to cope, reducing stress and improving mood [43, 44]. Even short visits to these gardens of five minutes in duration have been demonstrated to have a positive effect on the mental well-being of patients [43, 44].

1.2 Green Exercise

There is growing empirical evidence to show that exposure to nature brings substantial mental health benefits, with the key message emerging that contact with these green spaces improves psychological health by reducing stress levels, enhancing mood and improving self-esteem [45]. Participating in physical activity is also known to result in positive physiological and psychological health outcomes [19, 20]. Therefore over the last nine years at the University of Essex, these ideas have been combined into a program of research investigating the synergistic health benefits of engaging in physical activities whilst simultaneously being exposed to nature and this is referred to as ‘green exercise’ [25, 37, 46-48].

From this wide variety of University of Essex green exercise research, three broad health outcomes have been discerned: i) improvement of psychological well-being (by enhancing mood and self-esteem, whilst reducing feelings of anger, confusion, depression and tension)[37, 46, 47]; ii) generation of physical health benefits (by reducing blood pressure, improving heart rate variability and perceived exertion) [37, 49, 50] and iii) facilitation of social networking and connectivity (by enhancing social interaction, relationships and engagement) [48]. Green exercise of any type in any green environment, can provide benefits for both physical and mental health [46, 47].

1.3 Gardening and Allotments

Gardening is an example of a green exercise activity. It can provide a number of benefits for health and well-being and is one of the most popular leisure activities in the UK. In fact in the last 20 years there has been a steady increase in gardening [51]. Gardening is considered to be a moderate intensity physical activity. Thus, individuals who garden regularly can achieve the PA recommendations and associated health benefits, such as reduced risks of cardiovascular disease, type II diabetes, obesity and hypertension [51, 52]. Gardening also allows contact with nature; thus resulting in participation in green exercise and additional benefits for health. Gardening reduces stress, anxiety and depression and promotes recovery from stress and mental fatigue [51, 52].

Whilst gardening in all areas can provide benefits for health through physical activity and contact with nature, gardening on allotments also facilitates social contact and encourages social interaction [51]. In the UK there are over 300,000 allotment plots in use. Allotments (sometimes referred to as community gardens) are public, rented, separate from the home, and generally focus on food
cultivation [53]. They are working class landscapes, which provide opportunities for the creation of landscapes by everyone. Allotments tend to be situated in community areas, allowing individuals from the same communities to interact with each other on a regular basis. This promotes neighbourhood renewal and active citiehships and also reduces social isolation [51]. Social isolation and a lack of social interaction are associated with poor health; gardening on allotments can help to overcome these issues and thus help to improve health.

Gardening on allotments also tends to focus on food production. Allotments typically grow a variety of different fruit and vegetable products for consumption by the individual or individuals working on the allotment. In the UK there are a large number of individuals who do not consume adequate fruit and vegetables and have a poor diet [3]. Individuals who work on an allotment and grow their own fruit and vegetables are more likely to consume them and thus adopt a healthy diet and lifestyle [54]. The adoption of a healthy diet is a key component to overall health and well-being.

1.4 Disconnections from Nature and Society: Rationale for the Research

Although gardening is one of the most popular leisure activities and facilitates access to nature there is a growing concern that both adults and children are becoming disconnected from the natural environment. Adults spend more time indoors, both at work and during their leisure time. One in eight UK office workers spend at least 48 hours per week at their desks [55] and the average person watches more than two hours of television per day, compared to 10 minutes of sport or outdoor activity [56]. With large numbers of elderly people living in residential and care homes, opportunities for contact with nature are often very limited thus enforcing a disconnection from nature.

Young people are also becoming more and more disconnected from nature and as a result are currently making fewer visits to the countryside than ever before. Only 10% of today’s generation of children play in natural places such as woodlands, countryside and heaths, compared to 40% of children thirty years ago [57]. The substitution of electronic media such as computer games, TV’s and play stations for outdoor play has contributed to a growing ‘Nature Deficit Disorder’ [58]. This phrase describes the human costs of alienation from nature, such as the diminished use of the senses, attention-deficit problems, behavioural difficulties and depression.

The loss of connection between children and nature is also termed as an ‘extinction of experience’ – where each generation passes on less experience of the natural environment [59]. This continuing loss of ecoliteracy and connection to nature means that when these young people become the policy makers and environmentalists of the future, they lack the understanding of nature and consequently its value [45]. Supporting adults to reconnect with nature and engaging children with nature from a young age can therefore encourage them to participate in more outdoor exercise and make more frequent countryside visits throughout adulthood.

Individuals are also becoming more isolated from other people yet our mental wellbeing is affected by our connections to others and support from our families, friends, local communities and the wider society. This social capital has a positive effect on our health and happiness [45, 60-62]. Levels of social interaction can also be directly influenced by nature [63-65], and green space can facilitate
social contact and give rise to stronger neighbourhood ties [63-66]. Thus, community allotment projects provide an ideal opportunity for people to access the health and social capital benefits associated with contact with nature. Initiatives such as community allotment projects target individuals of all ages and backgrounds and encourage intergenerational activity, which facilitates knowledge exchange and informal learning about the environment. These types of activities not only impact on activity levels, inform dietary choices and positively affect health and well-being; they also encourage social interaction and reconnect people with nature and food. Yet, the research evidence base documenting the health benefits of community allotment schemes is limited and most often anecdotal. The longer term changes in health parameters and behavioural choices are often not reported, but these outcomes would be useful in informing future commissioning of intergenerational community gardening groups and the overall health agenda.

2.1 Essex County Council

Essex County Council (ECC) seeks to ensure that Essex is a good place to live, whereby people can realise their potential in safe, prosperous communities. The community well-being team at ECC plays an important role in this process and aims to ‘encourage and support individuals and groups to take responsibility and action to improve their health and well-being, encouraging partners to consider the impact of wellbeing, maximise collaborative working and develop joined up responses’. The community well-being team runs a number of different projects all aimed at health and well-being promotion within the Essex community.

2.2 ‘Generations Growing Together’ Overview

In 2009, central government announced their plan to release funding to encourage intergenerational volunteering. Twelve projects around the country were successful at obtaining funding. Whilst Essex County Council (ECC) was not one of these, it is a council that is committed to developing new, ground breaking services. ECC therefore decided to run a similar programme alongside the government funded project. The programme was developed to combine ECC’s health and well-being strategies and government initiatives. In 2010 ECC pledged that they would ‘promote the establishment of a new generation of community orchards and allotments in Essex’, thus resulting in the ‘Generations Growing Together’ (GGT) Community Allotments programme. The GGT initiative targets people of all ages to encourage an intergenerational approaches to gardening, breaking down barriers, challenging negative stereotypes and behaviour and encouraging a cycle of activity resulting in growing food together. ECC recruited five community allotments throughout Essex to participate in the GGT programme. They worked in partnership to provide advice and support to existing community allotments, link partners together and promote site existence for new projects to increase volunteer uptake, and work with local partners to source land and instigate areas for community development.

2.3 The Community Allotments

Five community allotments located in various regions of Essex consented to participate in the GGT evaluation programme; including allotments run by the Wilderness Foundation, Clacton Digs It, Sure Start, Education and Youth Services (EYS) and Roundwood’s. The Wilderness Foundation allotment is located in Chelmsford and run and maintained by Wilderness Foundation staff and five regular volunteers. Regular attendees include school groups and local volunteers. Prior to the start of the GGT programme the allotment had been running for several years.

The Clacton Digs It allotment is run by North East Essex NHS and maintained by one key staff member and three to four regular volunteers. Like the Wilderness Foundation allotment, the Clacton...
Digs It allotment had been running for a significant period of time prior to the start of the programme.

The Sure Start allotment, located in Chelmsford, had also been running for many years prior to the start of the programme. The project is run by Sure Start and is maintained and tended to by several key employees. The Sure Start allotment provides opportunities for families with young children to have a go at digging, planting, watering and harvesting fruit and vegetables and also taking them home to cook. Although there were several families who had been attending for a number of months and in some cases years, the community allotment was also attracting new families each week.

The EYS allotment is located in Colchester and was attended by students enrolled in a land-based college course. The participants were therefore all relatively new to working on the allotment, as the GGT programme started at the beginning of the college year. There were approximately 12 students on the course. The Roundwood’s allotment, located in Braintree, was set up by ECC alongside Roundwood’s staff. It was therefore the only allotment which had not been used by participants prior to the start of the programme. However, there were several health and safety issues associated with the use of the allotment such as lone working and the use of the garden centre tools by members of the community, thus the allotment was not regularly used throughout the evaluation programme. Further details of each community allotment can be found in the individual project reports.

2.4 Participants

The community allotment projects target many different beneficiary groups including those who have a disability; those who reside in an area of high social deprivation; children; unemployed; and elderly and those recovering from illness or injury. Further details of participant characteristics can be found in the results section and individual project reports.

2.5 Key Aims and Objectives of the Evaluation

The aims of the GGT community allotment programme were to:

- Understand the benefits to be gained from intergenerational community gardening and how this meets the needs of communities across Essex.
- To research and evaluate what ‘works’ and to better understand which approaches can and should be replicated or mainstreamed.

The key objectives were to:

- Increase physical activity levels
- Improve emotional well-being
- Improve access to fresh fruit and vegetables and encourage adoption of a healthier diet
- Increase scope for intergenerational activity including knowledge exchange and informal learning
• Reduce social isolation and increase the opportunity for social engagement
• Improve levels of community volunteering

The aims of the University of Essex evaluation of the GGT programme were therefore:
• To provide an independent monitoring and evaluation tool to assess the key outcomes of participation in community allotment projects.
• To assess the impact of the community allotments on emotional well-being, experience of nature, physical activity, dietary choices, intergenerational activity, social isolation and social engagement.
• To determine which aspects of community allotment activities were most and least enjoyed.
3. Methodology

3.1 The University of Essex Short Composite Questionnaire

The University of Essex provided an independent monitoring and evaluation programme to assess key outcomes of the GGT evaluation programme. Having an independent evaluator eliminated any potential bias, so that the implementers would not have conflicting roles in the programme.

A short composite questionnaire was administered in order to obtain both qualitative and quantitative data regarding the impact of the community allotments. Data was collected between April 2011 and March 2012, at five community allotment sites throughout Essex. Questionnaires were distributed by University of Essex researchers and trained allotment co-ordinators, who had been fully briefed on the process of evaluation.

The questionnaire incorporated internationally recognised and standardised tools to measure participants’ mental well-being and connectedness to nature. Questions were also asked to determine indoor and outdoor physical activity participation, community belonging and satisfaction, social interaction and food choices. Participants were asked questions regarding intergenerational contact, what the experience taught them about themselves, nature and other people and also what they enjoyed most and least about the allotment activities.

Questionnaires were administered at the start of the GGT evaluation programme, and six months later, representing the programme start and end points. Some participants also completed questionnaires one year after the GGT programme started to determine whether changes in health parameters were sustained over a longer period of time, even when the allotments had been closed for several months over the winter. The distribution of the questionnaires at these time points allowed any changes in parameters throughout the programme process to be identified. Questionnaires were administered at the same time points in all five allotments. Participants’ were asked to complete the questionnaires individually, without discussing their answers with others. All completed questionnaires were sent to the University of Essex for independent analysis.

3.2 Training and Acclimatisation

The community allotment project staff and volunteers were fully informed about the University of Essex evaluation at a training/acclimatisation session run by the lead researcher in March 2011. Guidelines on how to administer questionnaires in an ethically sound and correct way were provided, along with an opportunity for a question and answer session. In addition an evaluation guidelines document and ongoing telephone support were provided to compliment this process.
3.3 Case Studies

Two in-depth case studies were also completed, asking participants’ more detailed questions about their allotment experience. Community allotment project staff was encouraged to inform researchers of willing volunteers to provide more in-depth case studies. Two projects put individuals forward who were then contacted by researchers whereby semi-structured interviews were conducted to collect personal testimonies. This case study data was used to compliment the quantitative and qualitative group data.

3.4 Ethics and Consent

All participants of the community allotment projects were invited to take part in the programme on a purely voluntary basis. A participant information sheet was provided for all participants which detailed i) the evaluation process; ii) how to withdraw from the programme or contact the research team and iii) information on access and storage of personalised data (in line with the Data Protection Act). Questionnaires were designed to be anonymous and the only personal data collected included participant date of birth and postcode, purely for matching questionnaires from the same participant at different data collection points. Only participants who provided their written consent to take part in the evaluation process completed questionnaires. Parental consent was acquired for all children under the age of 18 years. Participants also provided written consent for the University of Essex research team to use photographic images as appropriate. Ethical approval for the research was granted by the Science and Engineering Faculty Ethics Committee at the University of Essex. Essex County Council research governance approval was also granted.

3.5 Composite Questionnaire Measures

The composite questionnaire comprised a number of different measures to address well-being, nature experience, physical activity, community belonging, satisfaction and safety, diet and healthy eating, social interaction and intergenerational links.

3.5.1 Well-being

Wellbeing was measured using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS). The WEMWBS was developed by the Universities of Warwick and Edinburgh, to enable the measurement of mental well-being of adults in the UK. The scale comprises a global well-being measure, including affective-emotional aspects, cognitive evaluative dimensions and psychological functioning, and is short enough to be practical for use in population-level surveys [67].

The WEMWBS is a 14 item scale of mental well-being, in which all items are worded positively and address aspects of positive mental health. The positively focussed design of the WEMWBS enables its use by mental health promotion initiatives [68]. The scale is scored by summing responses to each item answered on a five point Likert scale, from 1 (none of the time) to 5 (all of the time).
GGT Evaluation (Wood et al., 2012)

minimum scale score is 14 and the maximum is 70. WEMWBS has been validated for use in the UK with those aged 16 years and above [69]. WEMWBS showed good content validity; Cronbach’s alpha scores ranging from 0.89 to 0.91 and high correlations with other mental health and well-being scales. Test-retest reliability at one week was high (0.83) and social desirability bias was lower or similar to that of other comparable scales [67].

3.5.2 Nature Experience

Nature relatedness describes an individual’s level of connectedness with the natural world and comprises the cognitive, affective, and physical connection we have with nature [70, 71]. The scale has three subscales; self, perspective and experience. The experience subscale of the nature relatedness scale has been used in the composite questionnaire as it measures ‘a physical familiarity with the natural world and the level of comfort with and desire to be out in nature’ [70].

The experience part of the nature relatedness scale consists of six questions, rated on a five-point likert scale from 1 (disagree strongly) to 5 (agree strongly). Two of the questions are reverse scored. A score for the experience scale is created by adding the total score and dividing by six. A high score indicates a high level of experience with nature [70, 71]. The experience scale has a high internal reliability, with a cronbach alpha of 0.8 and good test-retest reliability (r=0.85) [70, 71].

3.5.3 Physical Activity

The current physical activity recommendations in the UK state that adults should undertake at least 30 min of moderate-intensity activity at least five times a week and the Department of Health is keen to increase the number of people achieving these guidelines [19]. For this reason ECC like many other organisations is interested in the baseline physical activity levels of participants and any changes that may occur as a result of involvement in the community allotment projects.

A single item measurement was therefore included to assess both indoor and outdoor physical activity. Participants were asked ‘In the past week, on how many days have you done at least 30 minutes of moderate intensity physical activity (made you breathe harder) indoors, such as yoga, Tai Chi, bowls, keep fit, swimming, badminton, housework etc?’ They were also asked ‘In the past week, on how many days have you done at least 30 minutes of moderate intensity physical activity (made you breathe harder) outdoors, such as brisk walking, cycling, gardening, golf, tennis and active recreation?’ These single item measures have been widely utilised since 2007 by Natural England and the British Heart Foundation in their ‘Outdoor Health Questionnaire’ used in the evaluation of the national ‘Walking the way to Health’ Programme [72].

Single item measures such as these have since been tested for validity and test-retest reliability [73]. The single-item instrument demonstrated strong reproducibility (r=0.72–0.82), using Spearman’s rank correlation coefficients and showed strong agreement in the classification of respondents meeting the current physical activity recommendation (kappa=0.63, 95% CI 0.54 to 0.72) [73].

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A single item measure was also used to assess the time spent sitting. Participants were asked ‘In the past week how much time have you spent sitting?’ This question was utilised in order to determine how much time participants spent in sedentary behaviour in addition to being physically active.

3.5.4 Community Belonging, Satisfaction and Safety

Participants were asked questions regarding how often they helped or attended activities in their local area, how strongly they felt they belonged to their community, how satisfied they were with it as a place to live and how well people in the community get on together. Participants responded to these questions by selecting one of the available answer categories, each of which were specific to the individual questions. These questions have been successfully used by the University of Essex in previous similar studies.

Participants were also asked to respond to several questions regarding safety and isolation within their community. These questions were scored on a five point likert scale, from 1 (strongly disagree) to 5 (strongly agree). An overall score for the five questions was also generated ranging from 5 to 25, with a higher score representing a greater feeling of safety and reduced isolation. The questions were all devised by the University of Essex for specific use in this study.

3.5.5 Diet and Healthy Eating

Questions on priorities relating to eating habits were included in the composite questionnaire. The questions used were originally developed for use as part of the Big Lottery Fund National Well-being Evaluation [74], by their evaluators the Centre for Local Economic Strategies (CLES) and New Economics Foundation (NEF)[75, 76]. Three questions from the Core tool were used, asking participants to state how much they agree or disagree with the statements: “I enjoy putting effort and care into the food that I eat” and “Healthy food often tastes nicer than unhealthy food”. Questions were scored on a five point likert scale from 1 (strongly disagree) to 5 (strongly agree). Higher scores were associated with more healthy eating behaviours and a total score was generated by summing the scores for the three questions. The maximum score was 15 and the minimum score was 3. One question from the in depth ‘Healthy Eating Module: Goals, intentions and confidence’ was also used, where participants are asked to rank in order of importance a number of food criteria (e.g. cost, ease of preparation, taste etc)[77].

3.5.6 Social Interaction

Participants were asked four questions regarding social interaction and having people in their lives who cared about them and whom they regularly interacted with. The questions were scored on a five point likert scale from 1 (strongly disagree) to 5 (strongly agree) and a total score was generated for the four questions, ranging from 4 to 20, with a higher score representing greater interaction. One of the four questions was reverse scored.
3.5.7 Intergenerational Links

Participants were provided with two questions regarding the benefits and opportunities for intergenerational activity, scored on a five point likert scale, from 1 (strongly disagree) to 5 (strongly agree). Higher scores were associated with more positive intergenerational behaviour. Open-ended questions were also asked regarding intergenerational links, including how often the participants spent time with people from other generations, what types of activities they performed with them and whether they thought this contact was a good idea. All questions were devised by University of Essex researchers.

3.5.8 Qualitative Evidence

Qualitative narrative was collected using a series of open-ended questions in the administered questionnaires and at the follow up interviews with case study volunteers. Participants were asked to tell us what they enjoyed most about the allotment activities, what they least enjoyed and whether they would change anything about the allotment project. They were also asked what attending the allotment had taught them about themselves, other people and nature.

3.6 Statistical Analysis

Questionnaires and interview transcripts were inputted and stored electronically on databases using either Microsoft Excel or PASW version 18.0. Databases were created using PASW (v 18.0) to assist in manipulating data, detecting inconsistencies and statistically analysing the results. Statistical analysis was performed where possible using a variety of non-parametric tests. Statistical significance was set at $p < 0.05$. Parametric testing was not possible due to the small sample sizes and stringent assumptions of parametric techniques. Statistical tests and results are only reported where statistical significance was evidenced, due to the large amount of data. In cases where there was not statistical significance only descriptive information on the results was provided. Descriptive statistics (mean and standard deviations) also provide an insight into any interesting trends or patterns in results.

A series of Kruksal-Wallis tests were conducted on baseline data scores collected at the start of the GGT programme to see if there were any differences between community allotment projects. No significant differences were observed in well-being, nature experience or physical activity so data from all of the community allotments were analysed as one group. Where significant differences were identified the group was either removed from the combined dataset or a combined dataset was not produced. In these cases individual allotment data can be found in the separate project reports.

For combined data, Mann Whitney U-tests were performed to compare the start and end of programme scores for participants who completed the scales at both or either of the two time points. Alternatively, Wilcoxon tests were performed to compare the start and end of programme
scores for participants who completed the questions at both the start and end and therefore had paired data. Only significant differences are reported in the results.

Differences in the variables due to factors such as i) allotment attended; ii) gender; and iii) time spent attending the allotment were also analysed by calculating the index of change in scores (i.e. subtracting the pre score from the post score to provide an increase or decrease in value). Means were then compared using a Kruksal-Wallis test (with pairwise comparisons using Dunn’s (1964) procedure with a Bonferroni correction for multiple comparisons) for allotment attended and time spent attending the allotment. A Mann Whitney U test was used to compare changes in variables according to gender.
4. Results- Composite Questionnaire

4.1 Participant Details

A total of 57 participants took part in the GGT programme. The majority of participants were male (59.6%), whilst 40.4% were female. The age range of the participants was 16-70 years with a mean age of 35.9±15.7 years. The majority (51.9%) were aged 16-24 years, whilst a small percentage was over 50 years of age. In terms of ethnic origin, 87.1% of participants were classified as ‘White British’, whilst 5.1% were classified as ‘other white’ and 2.6% as ‘Chinese’, ‘African’ and ‘other’. Participants were also sub-categorised according to how long they had been attending the allotments. At the start of the GGT programme 41.5% of participants had ‘just started’ attending the allotment, 9.8% had been attending for 1-6 months, 26.8% for 6-12 months and 22% for longer than one year (Figure 3).

![Figure 3: Number of months participants had been attending the allotments at the start of programme (N=41)](image)

Table 1 details which allotment group the participants attended. The Wilderness Foundation allotment had the greater number of attendees on testing days, followed by Colchester Digs It and Chelmsford Sure Start allotments. Clacton Digs It had the fewest participants. The EYS group had the greatest number of males, whilst the Sure Start group had the largest number of females. Participants at the Wilderness Foundation and Sure Start allotment were the oldest, whilst Roundwood’s participants were youngest.
Table 1: Participant details for each allotment group (n=57)

<table>
<thead>
<tr>
<th>Community Allotment Group</th>
<th>Wilderness Foundation</th>
<th>Clacton Digs It</th>
<th>Chelmsford Sure Start</th>
<th>Education and Youth Services (EYS)</th>
<th>Roundwoods</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of participants</td>
<td>15</td>
<td>8</td>
<td>12</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>No. of males</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>No. of females</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>No. unclassified</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Mean ± SD Age (years)</td>
<td>46.1±16.6</td>
<td>41.0±8.7</td>
<td>36.1±16.1</td>
<td>23.4±8.2</td>
<td>21.6±6.1</td>
</tr>
</tbody>
</table>

4.2 Allotment Groups Combined

The data for the five allotment groups were combined. However, prior to combining all data, the baseline scores collected for each community allotment project at the start of the programme were compared using a Kruskal-Wallis test. For the well-being, nature experience, physical activity and sitting time, any groups whose results were deemed to be statistically different to any of the other groups were removed from the analysis and only the remaining group results were combined. For community safety and isolation, social interaction, diet and intergenerational links, scores were only combined when all groups’ scores were statistically similar. For all measures two outcomes are reported: i) mean score for all participants completing questionnaires at either time points; ii) mean score for participants who completed questionnaires at both time points, so their data is paired and tracked over time. Results for individual allotment groups can be found in the individual reports.

4.2.1 Well-being

A Kruskal-wallis test was used to compare the baseline well-being scores in the five allotment groups. The test revealed no significant differences; thus the well-being scores for the five allotment groups were comparable and the data was combined. The average well-being score at the start of the programme was 51.0±7.5, with scores ranging from 38 to 69 (Figure 4). The average well-being score at the end of the programme was 56.0±9.9, with a low score of 33 and a high score of 70. Well-being scores therefore increased by an index of 5.0 (9.8%) during the evaluation process, indicating an improvement in well-being. An average well-being score is 50.7 [69]; thus not only did participants improve their well-being, but the participants reported a better than average well-being at the end of the programme. Baseline scores were also slightly above average implying that participation in allotment activities may have already contributed to an enhanced well-being.
For the 14 participants who completed the well-being scale both at the start and end of the programme process, paired\(^1\) mean scores were 50.1±8.5 and 50.6±9.9 respectively, indicating that there was an improvement in well-being by an index of 0.5 (1.0\%) (Figure 5).

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\(^1\) Paired scores are those for participants who completed the questionnaire at the start and end of the programme. These participants have a paired set of data.
4.2.2 Nature Experience

A Kruskal-Wallis test revealed no significant differences between the starting nature experience scores in the five allotment groups. The scores for the groups were therefore combined. The average nature experience score at the start of the programme was 3.8±0.7, remaining consistent six months later at 3.8±0.8 (Figure 6). The scores at the start ranged from 2-5, whilst scores at the end ranged from 2.7 to 5. The scores were identical at both data collection points, suggesting that there was no change in the nature experience scores.

![Nature experience scores at the start and end of the programme for all participants.](image)

*Figure 6: Nature experience scores at the start and end of the programme for all participants.*
*N=49 at start and N=13 at end. Note: A higher score = greater experience of nature.*

Only 13 participants completed the scale at both time points. Paired mean scores were 3.6±0.7 and 3.8±0.8 (Figure 7), indicating an increase in nature experience by an index of 0.2 or 5.6%.
4.2.3 Physical Activity

A Kruskal-wallis test revealed no differences between the different allotment groups in either indoor or outdoor moderate physical activity behaviour. The results were therefore combined. At the start of the programme the mean number of days of indoor moderate activity was 3.4±1.9 days, whilst the mean number of days at the end of the programme was 3.6±2.0 days (Figure 8). The mean score therefore increased by an index of 0.2 days. Scores at the start and end ranged from 0-7 days. At baseline the mean number of days of outdoor activity was 4.4±1.9 days, whilst the number of days of outdoor physical activity at the end of the programme was 3.8±2.1 days, indicating a decrease in outdoor activity over the course of the programme by an index of 0.6 days (Figure 8). However, the number of active days reported at the start of the programme was higher for outdoor activity than indoor activity and outdoor activity is more affected by the weather. Scores at the start ranged from 0-7 days, whilst scores at the end ranged from 1-7 days.

Only 14 participants responded to the indoor moderate physical activity question at both time points. Paired mean scores at the start and end of the programme were 3.2±1.9 days and 3.5±2.1 days respectively, indicating an increase in moderate intensity physical activity by an index of 0.3 days (Figure 9). Paired mean scores for the 15 participants who completed the outdoor physical activity scale at the start and end of the programme were 4.3±2.2 days and 3.8±2.1 days respectively (Figure 9). The number of days of outdoor moderate intensity activity decreased by an index of 0.5, indicating that they performed less physical activity outdoors by the end of the programme.
Figure 8: Number of days active indoors and outdoors per week at the start and end of the programme for all participants

N=49 at start and 15 at the end for indoor physical activity, N=50 at the start and 15 at the end for outdoor physical activity

Figure 9: Paired number of days active indoors and outdoors per week at the start and end of the programme

N=14 for indoor physical activity, N=15 for outdoor physical activity

A Kruskal-Wallis test revealed that there was significant differences between the allotment groups in the time spent sitting at the start of the programme ($x^2(4)$= 11.7; P<0.05), with the EYS group having a significantly lower sitting time than the Sure Start group (Z=-3.1; P<0.005) and lower sitting time
than in all other groups. The time spent sitting in the EYS group was therefore eliminated from the overall group results to enable a fair comparison.

The average time spent sitting per week at the start of the programme in the remaining four groups was 19.9±18.1 hours, whilst the average time spent sitting at the end was 32.6±26.5 hours, with a range of 2 to 100 hours at the start and 7 to 100 hours at the end. This represents a large variation in self-reported sitting time, so findings should be interpreted with caution. The mean score increased by an index of 12.7 hours, indicating an increase in sedentary behaviour by 63.8% (Figure 10).

![Figure 10: Time spent sitting per week at the start and end of the programme for all participants](image)

Only eight participants completed the scale at both the start and end, paired mean scores were 34.1±28.9 and 32.3±28.3 hours respectively, indicating that the time spent sitting decreased by an index of 1.4 hours (4.1%) in the eight participants over the course of the programme (Figure 11). This obviously tells a different story to Figure 10, again raising concern about the reliability and validity of the data.
4.2.4 Community Belonging, Safety and Satisfaction

Participants were asked how often in the last year they helped with or attended activities organised in their local area. At the start of the programme, 47.6% reported that they helped at least once a week, 21.4% once a month, 2.4% once every three months, 4.8% once every six months, and 9.5%, 7.1% and 7.1% reported that they ‘helped less often’, ‘never helped’ or ‘didn’t know’ respectively. At the end of the programme 46.7% and 20% reported that they helped with or attended community activities at least once a week or once a month respectively, indicating that attendance at community activities remained constant throughout the programme. No participants reported that they helped or attended community activities every three or six months, representing a reduction from the start of the programme. At the end of the programme process there was also an increase in participants who helped or attended less often than every six months (13.3%) and who reported that they did not know (13.3%) (Figure 12).
Participants were asked how strongly they felt they belonged to their immediate neighbourhood or community. At the start of the programme 21.4% reported that they very strongly belonged to their community, 47.6% fairly strongly and 26.2% and 4.8% respectively not very strongly and not at all strongly (Figure 13). At the end of the programme 13.3% and 73.3% strongly agreed and agreed with the statement, representing an increase in belonging. Only 13.3% said they did not very strongly agree (Figure 13).
Participants were also asked how satisfied or dissatisfied they were with their neighbourhood as a place to live. At the start of the programme 23.8% and 35.7% respectively said that they were extremely and fairly satisfied, whilst 4.8% said that they were extremely and fairly dissatisfied, whilst 31% said that they were neutral (Figure 14). At the end of the programme, 13.3% said that they were extremely satisfied with their neighbourhood as a place to live, a reduction from the start of the programme. However, 40% said they were fairly satisfied, representing a 4.3% increase from the beginning of the programme. At the end of the programme a greater percentage of subjects reported that they were neutral (33.3%), fairly dissatisfied (13.3%) and extremely dissatisfied (13.3%) (Figure 14).

![Figure 14: Neighbourhood satisfaction at the start and end of the programme for all participants](image)

Participant Response (%)

Start
End

Participants were asked to what extent they agreed or disagreed that their local area was a place where people from different backgrounds get on well together. At the onset of the programme 16.7% and 40.5% respectively reported that they definitely agreed or tended to agree. 2.4% tended to disagree and strongly disagreed, whilst 33.3% said that they didn't know, 2.4% said that there were either too few people in their local area or that individuals were all of the same background (Figure 15). At the end of the programme 66.7% tended to agree that their neighbourhood was an area where different people get on well together, an increase from the start of the programme. Fewer people said that they didn't know at the end (20%), whilst no participants said that they definitely agreed (Figure 15).
With regards to neighbourhood respect, participants were asked how much of a problem they thought there was with people not treating each other with respect and consideration. At the start of the programme, 4.3% and 31.9% respectively said that there was a very big, or fairly big problem, whilst 53.2% and 4.3% respectively said that there was not a very big problem or not a problem at all. 6.4% did not know or had no opinion (Figure 16). At the end of the programme 13.3% said there was a very big problem with respect and consideration, 33.3% and 26.7% said there was a fairly big or not a very big problem respectively, whilst 20% said there was not a problem at all and 6.7% had no opinion. At the end of the programme a greater proportion of individuals said that there was no problem at all with respect and consideration (Figure 16).
Table 2 displays the responses to the five community safety and isolation questions at the start and end of the programme. At the start of the programme community safety was varied, several participants did not feel safe walking in the community (68.4%), or going out at night (42.1%). Several participants however disagreed that they were isolated from members of their community (45.5%), and many felt part of their community (52.7%). At the end of the programme community isolation and worry about crime changed very little. A greater percentage of participants reported that they felt part of their community, however felt less safe walking in their community or going out at night. This is likely to be due to the greater proportion of participants who reported that they were neutral in response to these questions.
Table 2: Participants responses to community safety and isolation questions at the start and end of the programme

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree (%)</th>
<th>Disagree (%)</th>
<th>Neutral (%)</th>
<th>Agree (%)</th>
<th>Strongly Agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel very isolated from members of my community</td>
<td>Start (N=57)</td>
<td>12.7</td>
<td>45.5</td>
<td>36.4</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>End (N=13)</td>
<td>7.7</td>
<td>46.2</td>
<td>38.5</td>
<td>7.7</td>
</tr>
<tr>
<td>I worry a lot about crime in my community</td>
<td>Start (N=57)</td>
<td>9.1</td>
<td>31.0</td>
<td>32.7</td>
<td>27.3</td>
</tr>
<tr>
<td></td>
<td>End (N=14)</td>
<td>0.0</td>
<td>38.5</td>
<td>30.8</td>
<td>15.4</td>
</tr>
<tr>
<td>I feel part of my community</td>
<td>Start (N=57)</td>
<td>1.8</td>
<td>7.0</td>
<td>38.6</td>
<td>47.4</td>
</tr>
<tr>
<td></td>
<td>End (N=13)</td>
<td>0.0</td>
<td>15.4</td>
<td>15.4</td>
<td>61.5</td>
</tr>
<tr>
<td>I feel safe walking in my community</td>
<td>Start (N=57)</td>
<td>3.5</td>
<td>12.3</td>
<td>15.8</td>
<td>45.6</td>
</tr>
<tr>
<td></td>
<td>End (N=14)</td>
<td>7.1</td>
<td>7.1</td>
<td>21.4</td>
<td>64.3</td>
</tr>
<tr>
<td>I feel safe going out at night in my community</td>
<td>Start (N=57)</td>
<td>12.3</td>
<td>19.3</td>
<td>26.3</td>
<td>28.1</td>
</tr>
<tr>
<td></td>
<td>End (N=14)</td>
<td>21.4</td>
<td>7.1</td>
<td>35.7</td>
<td>28.6</td>
</tr>
</tbody>
</table>

A Kruskall-wallis test revealed that there were significant differences in the total community isolation and safety start scores between the five allotment groups ($X^2(4)= 14.5; P<0.001$), with significant differences between the Wilderness Foundation and Roundwood’s group ($Z=-3.0; P<0.005$) and the Wilderness Foundation and Sure Start group ($Z=-2.8; P<0.005$). The total scores therefore do not enable analysis on all groups combined. Scores for individual allotments can be located in individual project reports.

4.2.5 Diet and Healthy Eating

Table 3 displays participants’ responses to the healthy eating and diet questions at the start and end of the programme. At the start of the programme a large number of participants (82.5%) reported that they either strongly agree or agree that they enjoy putting effort and care into the food that they eat, whilst only 3.5% disagreed or strongly disagreed. 54.4% of participants agreed or strongly agreed that healthy food tastes nicer than unhealthy food, whilst 19.4% either disagreed or strongly disagreed. 68.4% also reported that they often eat meals cooked from basic ingredients. Only 5.3% disagreed or strongly disagreed with this statement. At the end of the programme a greater number of participants either strongly agreed or agreed that healthy food tastes nicer than unhealthy food (75%) and that they cook meals from basic ingredients (80%). A similar number of participants strongly agreed or agreed that they enjoy putting effort and care into the food that they eat. A slightly greater percentage disagreed with this at the end of the programme.
Table 3: Responses to dietary and healthy eating questions at the start and end of the programme

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree (%)</th>
<th>Disagree (%)</th>
<th>Neutral (%)</th>
<th>Agree (%)</th>
<th>Strongly Agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I enjoy putting effort and care into the food I eat</strong></td>
<td>Start (N=57)</td>
<td>31.6</td>
<td>50.9</td>
<td>19.3</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>End (N=13)</td>
<td>25.0</td>
<td>58.3</td>
<td>8.3</td>
<td>8.3</td>
</tr>
<tr>
<td><strong>Healthy food often tastes nicer than unhealthy food</strong></td>
<td>Start (N=57)</td>
<td>22.8</td>
<td>31.6</td>
<td>28.1</td>
<td>14.0</td>
</tr>
<tr>
<td></td>
<td>End (N=14)</td>
<td>16.7</td>
<td>58.3</td>
<td>16.7</td>
<td>8.3</td>
</tr>
<tr>
<td><strong>I often eat meals cooked from basic ingredients cooked either by myself or someone else</strong></td>
<td>Start (N=57)</td>
<td>31.6</td>
<td>36.8</td>
<td>26.3</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>End (N=13)</td>
<td>40.0</td>
<td>40.0</td>
<td>20.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

A total diet and healthy eating score was also generated from the three questions. A Kruskal-Wallis test revealed significant differences between the baseline diet and healthy eating scores ($X^2(4) = 13.8; P<0.01$), with the scores at Roundwood's being significantly different to the Clacton Digs It ($Z=-2.6; P<0.005$) and Sure Start ($Z=-3.0; P<0.005$). The results for all allotment groups combined are therefore not reported. Results for individual allotments can be found in the individual project reports.

Participants were also asked to rank five aspects of their diet in order of importance. At the start of the programme; eating a healthy diet followed by choosing food products and dishes that participants enjoyed were ranked as the most important dietary components. Eating meals in company and choosing dishes that are quick and easy to prepare were ranked as the components of diet that were of least importance. Keeping spending low was also ranked as less important (Table 4). At the end of the programme participants again ranked a healthy diet and eating food that they enjoyed as the two most important dietary components, however choosing food products that were enjoyed became more important than a healthy diet. Eating meals in company was again the lowest ranked, followed by choosing meals that are quick and easy to prepare and keeping spending low (Table 4).
Table 4: Participants ranks for dietary components at the start and end of the programme

<table>
<thead>
<tr>
<th></th>
<th>Rank 1 (%)</th>
<th>Rank 2 (%)</th>
<th>Rank 3 (%)</th>
<th>Rank 4 (%)</th>
<th>Rank 5 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choosing food products and dishes that you enjoy eating</td>
<td>Start (N=46)</td>
<td>34.8</td>
<td>37.0</td>
<td>19.6</td>
<td>8.7</td>
</tr>
<tr>
<td></td>
<td>End (N=10)</td>
<td>54.5</td>
<td>27.3</td>
<td>9.1</td>
<td>9.1</td>
</tr>
<tr>
<td>Eating a healthy diet</td>
<td>Start (N=46)</td>
<td>43.5</td>
<td>23.9</td>
<td>17.4</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>End (N=10)</td>
<td>40.0</td>
<td>30.0</td>
<td>20.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Keeping your spending on food as low as possible</td>
<td>Start (N=45)</td>
<td>11.1</td>
<td>15.6</td>
<td>11.1</td>
<td>42.2</td>
</tr>
<tr>
<td></td>
<td>End (N=10)</td>
<td>0.0</td>
<td>30.0</td>
<td>39.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Eating your meals in the company of other people</td>
<td>Start (N=46)</td>
<td>4.3</td>
<td>6.5</td>
<td>30.4</td>
<td>21.7</td>
</tr>
<tr>
<td></td>
<td>End (N=10)</td>
<td>0.0</td>
<td>10.0</td>
<td>10.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Choosing food products and dishes that are quick and easy to prepare</td>
<td>Start (N=45)</td>
<td>6.7</td>
<td>17.8</td>
<td>20.0</td>
<td>22.2</td>
</tr>
<tr>
<td></td>
<td>End (N=10)</td>
<td>10.0</td>
<td>0.0</td>
<td>30.0</td>
<td>40.0</td>
</tr>
</tbody>
</table>

4.2.6 Social Interaction

Participants were asked whether they felt that they had people in their life that really cared about them. At the start of the programme 47.4% and 43.8% either strongly agreed or agreed that this statement was true (Figure 17). A small proportion were neutral (8.8%), but no one disagreed or strongly disagreed. At the end of the programme, all participants either agreed or strongly agreed with the statement (Figure 17), indicating that a greater proportion of participants perceived that they had support in their lives.

Figure 17: The extent to which participants’ agreed or disagreed that they have people in their life that really care about them at the start and end of the programme.

N=57 at the start, N=15 at the end.
Participants were next asked whether they agreed or disagreed that they regularly meet socially with friends and relatives. At the start of the GGT programme 42.9% and 41.1% respectively strongly agreed and agreed with the statements. No participants strongly disagreed, however 5.3% disagreed and 10.7% were neutral (Figure 18). At the end of the programme a smaller percentage of participants strongly agreed with the statement. However, a larger percentage agreed that they met socially with friends and relatives (66.7%) and a smaller percentage of participants reported that they were neutral (6.6%) (Figure 18). No participants disagreed or strongly disagreed, thus overall a greater proportion of the participants agreed or strongly agree that they regularly meet socially with friends and relatives by the end of the programme.

![Figure 18: The extent to which participants’ agreed or disagreed that they regularly meet socially with friends and relatives at the start and end of the programme.](image)

N=56 at the start, N=15 at the end.

Participants were also asked whether they found it difficult to meet people who share their hobbies or interests. At the start of the GGT programme only 1.8% and 12.3% respectively strongly agreed and agreed that they found it difficult to meet people with the same hobbies and interests as them. 22.8% of participants were neutral, whilst 42.1% disagreed with the statement and 21.1% strongly disagreed (Figure 19). At the end of the programme a similar proportion of participants strongly disagreed with the statement (21.4%), however less participants disagreed (28.6%) and more participants agreed that they find it difficult to meet people who share the same interests as them (21.4%). Encouragingly no participants’ strongly agreed with the statement at the end of the programme (Figure 19).
The final question regarding social interaction asked participants whether people in their local area help one another. At the initial data collection point no participants strongly agreed with the statement and only 29.8% agreed. 43.4% of participants were neutral, whilst 22.8% disagreed and 3.5% strongly disagreed (Figure 20). At the end of the programme 7.7% of participants strongly agreed that people in their local area help one another, an increase from the start of the programme. A greater proportion of participants also agreed with the statement (38.5%), whilst no participants disagreed and 7.7% strongly disagreed. 46.2% were neutral, a similar figure to the programme start (Figure 20). At the end of the programme more participants therefore felt that people in their local area helped each other.
A total social interaction score was generated from the four questions. A Kruskal-wallis revealed significant differences between the group start of programme social interaction scores ($X^2(4) = 13.7; P<0.01$), with differences between the Clacton Digs It and Sure Start group ($Z=-2.7; P<0.005$). The combined results are therefore not reported. Results for individual allotment groups can be found in the specific project report.

4.2.7 Intergenerational Links

Participants were asked two questions regarding their intergenerational contact. Participants were firstly asked the extent to which they agreed or disagreed that they ‘learn a lot from people of other generations’. At the start of the programme 23.2% and 57.1% respectively strongly agreed and agreed with the statement. 14.3% were neutral, whilst 5.4% disagreed and no participants strongly disagreed (Figure 21). At the end of the programme slightly fewer people strongly agreed and agreed (21.4% and 50% respectively), whilst more people disagreed and 7.1% of people strongly disagreed (Figure 21).
Participants were also asked whether they agreed or disagreed that they had lots of opportunities to meet people outside their normal social circle. At the start of the programme, 19.3% and 36.8% either strongly agreed or agreed, whilst 29.8% were neutral and 8.8% and 3.5% disagreed and strongly disagreed (Figure 22). At the end of the programme a greater proportion of people strongly agreed or agreed (71.4%), whilst few people were neutral (14.3%) or disagreed (7.1%). 7.1% of people strongly disagreed with the statement at the end of the programme (Figure 22).

Figure 21: The extent to which participants’ agreed or disagreed that they learn a lot from people of other at the start and end of the programme
N=56 at the start, N=14 at the end.

Figure 22: The extent to which participants’ agreed or disagreed that they had lots of opportunities to meet people outside their normal social circle at the start and end of the programme
N=56 at the start, N= 14 at the end.
A total intergenerational score was generated from the two questions. A kruskal-wallis test revealed no significant differences between groups in the start of programme intergenerational links score, thus enabling the scores to be analysed as one group. Fifty six participants generated an overall intergenerational score at the start and 12 at the end of the programme. The mean score at the start of the programme was 7.6±1.5, with a range of scores from 4 to 10. The mean score at the end of the programme was 7.4±2.7, with a minimum score of 2 and a maximum score of 10 (Figure 23). The score decreased slightly by an index of 0.2, representing a small 2.6% reduction.

![Figure 23: Overall intergenerational score for all participants at the start and end of the project](image)

Figure 23: Overall intergenerational score for all participants at the start and end of the project

N=56 at the start, N=12 at the end. Note: A higher score= greater intergenerational links

Only 12 participants generated a score at both the start and end of the programme. Paired mean scores were 7.8±1.5 and 7.4±2.7 respectively. The intergenerational score therefore decreased by an index of 0.3, equivalent to 3.9% (Figure 24). Scores were therefore fairly similar at the start and end of the programme.
Participants were also asked three open-ended questions regarding intergenerational contact. Some of the key responses to the questions are displayed in Box 1. Many people said that they often visited family and friends of other generations ranging from once a week to once a month. Very few people reported that they have no contact with people of other generations. The types of activities that were performed with those of other generations were varied, ranging from playing, talking and eating, to working on the allotment, cooking and gardening. The main motive for intergenerational contact was that a lot could be learned from people of other generations. They can share their ideas, views and perspectives on life and help with any issues or problems.
## Box 1: Responses to open-ended questions regarding intergenerational contact

**How often do you spend time with people of another generation? - Please tell us who they are?**

<table>
<thead>
<tr>
<th>Response</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Friends/neighbours occasionally”</td>
<td></td>
</tr>
<tr>
<td>“Once a week with my Mum, Dad, Nan and Granddad”</td>
<td></td>
</tr>
<tr>
<td>“Yes often we go to South Africa to see my grandparents, cousins and friends. I also see little children of family and friends”</td>
<td></td>
</tr>
<tr>
<td>“Every day with my mum, dad and little nephew”</td>
<td></td>
</tr>
<tr>
<td>“Every Wednesday I see my Nan and baby brother”</td>
<td></td>
</tr>
<tr>
<td>“Most weekends with my family, kids love seeing grandparents”</td>
<td></td>
</tr>
<tr>
<td>“People from the day hospital 2-3 times a week”</td>
<td></td>
</tr>
<tr>
<td>“Once or twice a week- local neighbours and allotments”</td>
<td></td>
</tr>
<tr>
<td>“Rarely, family live away”</td>
<td></td>
</tr>
<tr>
<td>“Four times a week grandparents, seven times a week young children”</td>
<td></td>
</tr>
<tr>
<td>“Community allotments most people of different ages and backgrounds”</td>
<td></td>
</tr>
<tr>
<td>“My parents everyday”</td>
<td></td>
</tr>
<tr>
<td>“Nieces once every two weeks”</td>
<td></td>
</tr>
<tr>
<td>“Three times a week- elderly neighbours, volunteer library, visit house bound”</td>
<td>“not often with youngsters”</td>
</tr>
<tr>
<td><strong>What types of activities do you do together?</strong></td>
<td></td>
</tr>
<tr>
<td>“Days out with family, picnics, farms, seaside, natural trust etc, Share meals”</td>
<td></td>
</tr>
<tr>
<td>“Play, go for walks”</td>
<td></td>
</tr>
<tr>
<td>“Watch TV and have dinners”</td>
<td></td>
</tr>
<tr>
<td>“Walk, shopping, park”</td>
<td></td>
</tr>
<tr>
<td>“Talk, cook, BBQ, eat”</td>
<td></td>
</tr>
<tr>
<td>“Gardening”</td>
<td></td>
</tr>
<tr>
<td>“Going out to restaurants”</td>
<td></td>
</tr>
<tr>
<td>“Variety of social activities, picnics, holiday club”</td>
<td></td>
</tr>
<tr>
<td>“Planting, building things, eating produce”</td>
<td></td>
</tr>
<tr>
<td>“Music group, singing, allotment group”</td>
<td></td>
</tr>
<tr>
<td><strong>Do you think it is a good idea to spend time with people of another generation to your own? If so, why?</strong></td>
<td></td>
</tr>
<tr>
<td>“Enjoyment”</td>
<td></td>
</tr>
<tr>
<td>“Absolutely, we can learn much from them. Also they get so much pleasure themselves in seeing their own children with their family and all having fun and laughter together”</td>
<td></td>
</tr>
<tr>
<td>“Yes exchange views and ideas”</td>
<td></td>
</tr>
<tr>
<td>“No”</td>
<td></td>
</tr>
<tr>
<td>“Yes share experiences”</td>
<td></td>
</tr>
<tr>
<td>“Yes to get to know everyone better as a community”</td>
<td></td>
</tr>
<tr>
<td>“Interesting to learn about their views, opinions, stories, life skills, knowledge”</td>
<td></td>
</tr>
<tr>
<td>“Yes, it is. It’s good because it gives you a view of life from another person’s eye. To listen to someone else’s views on a problem you could be having”</td>
<td></td>
</tr>
<tr>
<td>“Yes keep a perspective on life”</td>
<td></td>
</tr>
</tbody>
</table>
4.2.8 Qualitative Feedback

At the end of the programme participants were asked what they enjoyed most about the project, what they were not enjoying and what they would change. Some of the key responses to these questions are displayed in Box 2. The aspects of attending the community allotment which were enjoyed most by participants tended to meet with the GGT programme objectives. Participants enjoyed the exercise, meeting with friends and different people, being outside in green space and trying fresh fruit and vegetables; thus the allotments encouraged healthy eating, physical activity, nature contact and social interaction.

<table>
<thead>
<tr>
<th>What are you enjoying most about attending the allotment project?</th>
</tr>
</thead>
<tbody>
<tr>
<td>“The fresh air and exercise”</td>
</tr>
<tr>
<td>“Greenness”</td>
</tr>
<tr>
<td>“Meeting up each week and working with different people”</td>
</tr>
<tr>
<td>“Making friends and working together”</td>
</tr>
<tr>
<td>“Work, friendship, achievement”</td>
</tr>
<tr>
<td>“Growing and trying fresh fruit and veg”</td>
</tr>
<tr>
<td>“Being able to watch the children learn and have fun”</td>
</tr>
<tr>
<td>“Being outside doing something positive and constructive, and seeing how much fun and pleasure my children get from the project”</td>
</tr>
<tr>
<td>“Having an opportunity to learn a variety of skills”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What are you not enjoying about the project?</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Weeding”</td>
</tr>
<tr>
<td>“It’s frustrating when things go wrong, for example vegetables get attacked by pests”</td>
</tr>
<tr>
<td>“Competitiveness”</td>
</tr>
<tr>
<td>“Nothing”</td>
</tr>
<tr>
<td>“Rain and cold weather”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What would you change?</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Nothing”</td>
</tr>
<tr>
<td>“More wild poppies”</td>
</tr>
<tr>
<td>“Would like to try to do things differently and expand work to new areas”</td>
</tr>
<tr>
<td>“I would like to see more people involved in gardening and more allotments for community use. I would like to see more people helping each other out in their community”</td>
</tr>
<tr>
<td>“Perhaps a slightly longer session”</td>
</tr>
<tr>
<td>“I would change the number of times we went to the allotment-more outdoor learning”</td>
</tr>
</tbody>
</table>
4.3 Allotment Groups Comparison

The change in well-being and nature experience scores, the number of days of indoor and outdoor PA and the time spent sitting were calculated between the start and end of the GGT programme, by subtracting the start score from the end of programme score. The change was also calculated for the overall community safety and isolation score, the healthy eating and diet score and the social interaction and intergenerational score. In each case a Kruskal-wallis test was then performed to compare the change in scores between the allotment groups; no significant results were found. The Roundwood’s allotment was not included in the comparison as no participants completed the composite questionnaire at the end of the programme.

4.3.1 Well-being

The change in well-being for the four allotment groups is displayed in Figure 25. The change in the Wilderness Foundation and EYS groups were -0.8±5.8 and -0.3±1.5 respectively, indicating a reduction in well-being. The mean change in the Clacton Digs It group was 1.3±3.8 and the mean change in the Sure Start group was 2.3±4.0. Well-being improved in the Clacton Digs It and Sure Start participants from the start to the end of the programme; however the improvement was greatest in the Sure Start group.

4.3.2 Nature Experience

The mean change in nature experience in the Wilderness Foundation group was 0.0±0.6 indicating no change in the score, whilst the change in the Clacton Digs It group was 0.2±0.7 (Figure 26). The nature experience score changed by a mean of -0.1±0.3 in the Sure Start group and 0.6±0.6 in the
EYS group. Changes in nature experience were similar between groups; however the EYS group experienced the greatest improvement, whilst the Sure Start group experienced a slight reduction in nature experience.

![Figure 26: The change in nature experience in the allotment groups](image)

N=5 for Wilderness Foundation, N=3 for Sure Start and EYS, N=2 for Clacton Digs It. Note: A positive change indicates an improvement in nature experience.

### 4.3.3 Physical Activity

The change in the number of days of indoor moderate physical activity per week was -0.2±2.3 for the Wilderness Foundation group and -1.0±0.0 in the Sure Start group; thus indoor moderate physical activity declined (Figure 27). In the Clacton Digs It and EYS groups the mean changes were 1.3±2.5 and 2.0±1.4 respectively, indicating an increase in the number of weekly days of indoor physical activity. The mean change in the number of days of weekly outdoor moderate intensity physical activity was negative in all groups indicating a reduction in outdoor physical activity. The scores decreased by a mean of -0.5±2.2 and -0.3±1.5 in the Wilderness Foundation and Clacton Digs It groups respectively. In the Sure Start and EYS groups the scores decreased by -0.7±1.2 and -0.7±2.9 respectively (Figure 27).
The change in the time spent sitting was positive in the Wilderness Foundation and EYS participants indicating an increase in sitting time and thus sedentary behaviour. In the Wilderness Foundation scores increased by $0.6 \pm 11.9$ hours, whilst in the EYS group the sitting time increased by $3.0 \pm 0.0$ hours per week. The time spent sitting decreased in the Clacton Digs It and Sure Start groups by $-7.0 \pm 0.0$ and $-5.5 \pm 6.4$ hours per week respectively, indicating reduced sedentary behaviour (Figure 28).
4.3.4 Community Belonging, Safety and Satisfaction

The change in the community safety and isolation score was 1.5±1.9 in the Wilderness Foundation Group and 0.7±4.7 in the Clacton Digs It group indicating increased safety and reduced isolation. The mean change in the Sure Start and EYS groups was -0.7±1.5 and -1.7±2.1 respectively indicating reductions in safety and increased isolation in these two groups (Figure 29).
4.3.5 Diet and Healthy Eating

The diet and healthy eating score decreased slightly in the Wilderness Foundation, Clacton Digs It and EYS groups with mean changes of -0.3±0.5, -0.3±1.2 and -1.0±1.7 respectively. The diet and healthy eating score increased in the Sure Start group by a mean of 0.3±3.1 (Figure 30). The changes in the diet and healthy eating scores were very small over the course of the programme.

Figure 30: The change in diet and healthy eating in the allotment groups

N=4 for Wilderness Foundation, N=3 for Clacton Digs It, Sure Start and EYS. Note: A positive change indicates an increase in healthy eating

4.3.6 Social Interaction

The change in the social interaction score was negative in the Sure Start group with a mean change of -1.0±2.0. The change in the Wilderness Foundation, Clacton Digs It and EYS groups were positive with mean changes of 0.3±1.0, 1.0±1.0 and 2.0±1.7 respectively. Thus in these three groups social interaction increased. However, the changes in all groups from the start to end of the programme were small (Figure 31).
4.3.7 Intergenerational Links

The change in the Wilderness Foundation group’s intergenerational score was 0.0±1.0, indicating no change in intergenerational contact from the start to the end of the programme. In the Clacton Digs It group the mean change was -1.3±2.1, whilst in the Sure Start and EYS groups the mean changes were 0.7±1.5 and -1.0±2.6 respectively. Intergenerational links increased in the Sure Start group, but reduced in the Clacton and EYS groups (Figure 32).
4.4 Gender Comparison

The change in well-being and nature experience scores, the number of days of indoor and outdoor PA and the time spent sitting were calculated between the start and end of the GGT programme. The change was also calculated for the community safety and isolation score, the healthy eating and diet score and the social interaction and intergenerational score. In each case a Mann Whitney U-Test was then performed to compare the change in scores between genders. The tests revealed that there were no significant gender differences in any of the parameters. The Roundwood’s allotment was not included in the comparison as no participants completed the composite questionnaire at the end of the programme.

4.4.1 Well-being

The change in the well-being scores in males was -1.3±4.2, indicating a slight decrease in well-being over the course of the programme. The change in well-being in females was 1.5±3.5, indicating an increase in well-being (Figure 33). The changes in both males and females were small. The overall change was 0.4±4.2.

![Figure 33: The change in well-being in males and females](image)
N=7 for males, N=6 for females. Note: A positive change indicates an improvement in well-being

4.4.2 Nature Experience

The mean change in the nature experience score in males was 0.4±0.5, compared to a change of -0.2±0.6 in females. The males therefore increased their experience of nature, whilst the females decreased their experience of nature. However, changes in both males and females were only small (Figure 34).
4.4.3 Physical Activity

The mean change in the number of days per week of indoor moderate intensity physical activity in males was 0.7±2.8, compared to a mean change of -0.1±1.6 in females. Male indoor activity therefore increased over the course of the programme, whilst female indoor physical activity very slightly decreased (Figure 35). The mean change for number of days per week of outdoor moderate intensity physical activity for males and females was negative, with mean changes of -0.6±2.4 and 0.3±1.3 respectively. Thus in both males and females outdoor moderate intensity physical activity decreased very slightly (Figure 35).

The time spent sitting in males decreased by a mean of -2.4±7.5 hours per week from the start to end of the programme, indicating a decrease in sitting and sedentary behaviour. The female mean change was 0.0±12.6, thus females spent the same amount of time sitting at the start and end of the programme (Figure 36).
Figure 35: The change in days of indoor and outdoor moderate physical activity per week in males and females
N=6 for males indoors and N=7 outdoors and N=7 for females indoors and outdoors. Note: A positive change indicates an increase in outdoor physical activity.

Figure 36: The change in the time spent sitting per week in males and females
N=5 for males and N=4 for females. Note: A positive change indicates an increase in time spent sitting.

4.4.4 Community Belonging, Safety and Satisfaction

The mean change in the community isolation and safety score in females was 0.2±3.6, compared to no change (0.0±2.5) in males. The female score slightly increased, whereas the male score remained the same at the start and end of the programme (Figure 37).
4.4.5 Diet and Healthy Eating

The mean change in the diet and healthy eating score in males was 0.2±2.3, compared to -0.6±1.1 in females. Females diet score therefore changed in a negative direction, whilst the male score changed in a positive direction indicating an increase in healthy eating. However, the change in the scores for both males and females were small (Figure 38).
4.4.6 Social Interaction

The mean change in the social interaction score in males was 1.4±1.3, compared to a change of -0.4±1.7 in females. Males increased their social interaction over the course of the programme, whilst females experienced a slight reduction in social interaction (Figure 39).

![Figure 39: The change in social interaction in males and females](image)

N=7 for males and N=5 for females. Note: A positive change indicates an increase in social interaction

4.4.7 Intergenerational Links

In both males and females the intergenerational score decreased slightly by means of -0.3±2.0 and -0.5±1.9 respectively, indicating that intergenerational contact was slightly lower in both males and females at the end of the programme compared to the start (Figure 40).
4.5 Time Attending the Allotment

At the first data collection phase participants were asked how long they had been attending their prospective allotments. These were categorised as 1-4 weeks, 1-6 months, 6-12 months and over 12 months. A Kruskal-Wallis test was then used to compare scores in participants from the four time categories. Only significant results are reported in the section below.

4.5.1 Well-being

The mean well-being score in participants who had been attending their prospective allotment for between 1-4 weeks was 50.1±6.8. In participants who had been attending for 1-6 months and 6-12 months scores were 51.0±12.7 and 53.9±8.7 respectively, indicating that well-being was better in those participants who had been attending the allotment for longer. However for those participants attending for over one year the mean score was 50.9±7.6 (Figure 41). Data was not collected about frequency of visits, so even though some participants had been attending the allotment for over a year they may not have been attending regularly.
Figure 41: The start of programme well-being score in participants attending the allotments for different time periods

N=14 for 1-4 weeks, N=13 for 12 months+, N=8 for 6-12 months and N=2 for 1-6 months. Note: A higher well-being score = a better well-being

4.5.2 Nature Experience

The mean nature experience score in participants attending their allotment for 1-4 weeks and 1-6 months were 3.8±0.7 and 3.8±0.9 respectively. In participants attending for 6-12 months and 12 months+, the mean scores were 3.7±0.4 and 3.9±0.6 respectively. The nature experience score was highest in those attending the allotment for the longest time (Figure 42), indicating that those participants who had contact with nature through the allotment for the longest time had the greatest experience and familiarity with it.
GGT Evaluation (Wood et al., 2012)

Figure 42: The start of programme nature experience score in participants attending the allotments for different time periods

N=14 for 1-4 weeks, N=13 for 12 months+, N=7 for 6-12 months and N=3 for 1-6 months. Note: A higher well-being score = a higher nature experience

4.5.3 Physical Activity

The mean number of days per week of moderate physical activity indoors was 3.9±2.1 in those attending the prospective allotment for 1-4 weeks, increasing to 4.7±2.5 days in those attending for 1-6 months. For participants attending for 6-12 months the mean number of days per week decreased to 3.7±2.5 and for those attending for longer than one year there was a further decrease to 2.8±1.8 days (Figure 43). The mean number of days per week of outdoor moderate intensity physical activity in participants who had been attending the allotment for 1-4 weeks was 4.5±1.9, increasing to 5.7±1.2 in participants attending for 1-6 months. The number of days of outdoor physical activity decreased to 4.6±1.8 and 4.1±2.1 in participants attending for 6-12 months and 12 months+ respectively (Figure 43). For both indoor and outdoor PA there was a similar dose response.
The mean time spent sitting per week in participants attending the allotments for 1-6 months was lowest at 9.3±9.3 hours. Those attending for 6-12 months spent a mean of 10.9±10.4 hours sitting per week and participants attending for 1-4 weeks spent 13.3±7.7 hours sitting. Those attending for over 12 months spent the longest time sitting with a mean of 25.7±15.3 hours per week (Figure 44).
4.5.4 Community Belonging, Safety and Satisfaction

The mean community safety and isolation score in participants attending the allotments for 1-4 weeks was 18.1±2.8, compared to 13.7±4.5 in those attending for 1-6 months. In participants attending for 6-12 months and 12 months plus, the mean scores were 14.0±4.8 and 17.9±3.7 respectively. A Kruskal-wallis test revealed a significant main effect for the community safety and isolation according to the time participants had been attending the allotments (X^2(3)= 8.0; P<0.05). However, post hoc Mann Whitney U-tests with the bonferroni correction revealed no significant differences between the scores for the four groups. The participants attending for the shortest and longest times felt most safe and least isolated within their communities (Figure 45).

![Figure 45: The start of programme community safety and isolation score in participants attending the allotment for different time periods](image)

N=15 for 1-4 weeks, N=13 for 12 months+, N=8 for 6-12 months and N=3 for 1-6 months. Note: A higher score= less isolation and greater safety.

4.5.5 Diet and Healthy Eating

The mean diet and healthy eating score in participants attending the community allotments for 1-4 weeks was 11.1±2.5. The score increased to a mean of 12.3±2.5 in those attending for 1-6 months, decreased very slightly to 12.1±1.6 in those attending for 6-12 months and increased to 12.6±1.7 for those who had been attending their prospective allotments for more than once year (Figure 46). The diet and healthy eating score was lowest in participants who had only been attending the allotments for a short time and highest in those who had been attending for the longest time.
Figure 46: The start of programme diet and healthy eating score in participants attending the allotments for different time periods

N=15 for 1-4 weeks, N=13 for 12 months+, N=8 for 6-12 months and N=3 for 1-6 months. Note: A higher score = a healthier diet

4.5.6 Social Interaction

The mean social interaction score in participants attending the community allotments for 1-4 weeks was 14.9±1.8. In participants attending for 1-6 months it was 15.0±2.6, a higher score than those who had only been attending for a short time. For participants attending for 6-12 months and 12 months plus the mean scores were 15.6±1.1 and 15.6±2.6 respectively. The social interaction score was lowest in participants who had only just started at the allotments and highest in those attending for the longest two time categories (Figure 47).
Figure 47: The start of programme social interaction score in participants attending the allotment for different time periods

N=15 for 1-4 weeks, N=13 for 12 months+, N=8 for 6-12 months and N=3 for 1-6 months. Note: A higher score = more social interaction

4.5.7 Intergenerational Links

The mean intergenerational score in participants attending the allotments for 1-4 weeks and 1-6 months were 7.3±1.4 and 7.3±0.6 respectively. The mean score was higher in those attending for 6-12 months at 8.5±1.1, decreasing slightly to 7.4±1.8 for those attending for over 12 months. The intergenerational score was therefore highest in participants attending for 6-12 months (Figure 48).
Figure 48: The start of programme intergenerational links score in participants attending the allotment for different time periods.

N=15 for 1-4 weeks, N=13 for 12 months+, N=8 for 6-12 months and N=3 for 1-6 months. Note: A higher score = greater intergenerational links.
5. Results- Case Study Participants

Two participants volunteered to act as case studies, completing a follow-up questionnaire and more detailed questions regarding the effects of participation in community allotment activities. The results and responses to the case study questions are reported below. All results and quotes are anonymous and therefore participants have been given the pseudo names of ‘Hannah’ and ‘Tom’ to denote gender only.

5.1 Case Study 1- ‘Hannah’

Hannah had been attending the Wilderness Foundation allotment for six months at the start of the GGT programme and was a committed volunteer who attended the allotment on a weekly basis where possible. Hannah did not complete an end of programme questionnaire, but did complete baseline and follow-up questionnaires (collected one year after baseline data). The results of the follow-up questionnaire are presented below.

5.1.1 Well-being

At the start of the GGT programme Hannah had a well-being score of 64. At the follow-up phase, well-being had increased to 65, representing an improvement of 1.5% (Figure 49). The follow-up phase of data collection was performed after the winter when the allotment had been closed. Thus, an improvement in well-being was sustained throughout the winter even when Hannah was not working on the allotment.

![Figure 49: Hannah’s well-being scores at the start and follow-up phase of the programme. Note: A higher score = better well-being](image-url)
5.1.2 Nature Experience

Hannah’s nature experience score at the start of the programme was 3.0, increasing to 3.2 at follow-up (Figure 50). Hannah’s experience and familiarity with nature therefore increased by an index of 0.2 (6.7%) from start to follow-up, despite the lack of contact with nature on the allotment over the winter months.

![Figure 50: Hannah’s nature experience scores at the start and follow-up phase of the programme.](image)

Note: A higher score = greater experience of nature

5.1.3 Physical Activity

Hannah reported that she performed at least 30 minutes of moderate intensity physical activity indoors on two days per week at the start of the programme and five days per week at the follow-up phase (Figure 51). Thus indoor physical activity increased by 3.0 days per week over the duration of the programme and when access to the allotment was restricted over the winter. The number of days of 30 minutes of outdoor moderate physical activity at the start of the programme was 3.0 days per week, increasing to 5.0 at the follow-up phase (Figure 51). Outdoor physical activity therefore increased by 2.0 days per week over the course of the programme and during winter when the use of the allotment for physical activity was not available.
5.1.4 Community Belonging, Safety and Satisfaction

At the start of the programme Hannah’s overall community safety and isolation score was 14, increasing to 17 at follow-up (Figure 52). Hannah therefore felt less isolated from her community and more safe within her community. The score increased by an index of 3.0, equivalent to a 21.4% improvement. Community safety was therefore increased and isolation decreased over the course of the programme, a change which was sustained even without access to the allotment.
5.1.5 Diet and Healthy Eating

The diet and healthy eating score at the start and follow-up phase of the programme was 12. Diet and healthy eating therefore remained unchanged over the course of the programme (Figure 53). Hannah’s diet and healthy eating score was three points away from maximum, thus she already possessed a relatively healthy diet at the start of the programme, reducing the possibility for improvements. Hannah had been attending the allotments for six months, the improvements may therefore have occurred prior to the start of the GGT programme.

![Diet and Healthy Eating Score Graph](image)

**Figure 53:** Hannah’s diet and healthy eating score at the start and follow-up phase of the programme.

Note: A higher score = healthier diet

5.1.6 Social Interaction

Hannah’s social interaction score was 15 at the start of the programme, compared to 16 at follow-up. The score therefore increased by an index of 1.0, representing a 6.7% improvement in social interaction (Figure 54). Hannah’s interaction with family members, people from the local community and people who share the same interests therefore increased from the start to follow-up of the programme, even when social interaction on the allotment was restricted over the winter.
5.1.7 Intergenerational Links

Hannah’s intergenerational score decreased from 8.0 to 7.0 from start to follow-up representing a 12.5% reduction in intergenerational links and contact (Figure 55). The community allotment may have provided Hannah with key opportunities for contact with other generations, thus over the winter when the allotment closed this contact may have decreased.
5.1.8 Qualitative Feedback

In addition to the follow-up questionnaire, Hannah completed some detailed questions regarding the community allotment project. The questions and her responses are detailed below:

How has working on the allotment affected your health and well-being? How has it influenced factors such as physical activity and diet?

‘I have to say I haven’t noticed any notable change in health and well-being, mostly I think it’s the time factor. The wilderness group only meet up once a week and unfortunately I cannot attend on the re-appointed day. However, I still enjoy going up on Monday’s as I used to, doing the odd bits and admiring the growing progress of what are grown by the group members. With so little participation on my part, I find there is hardly any influence on my normal daily physical activity and diet.’

Do you think working on the community allotment helps to reduce social isolation? How does it help people to feel part of their community?

‘Definitely so, having the chance to chat with strangers, turn friends, then working constructively together and finally enjoying the fruits of everyone’s hard labour’.

How has participating in the project helped you to meet people outside your normal social circle (e.g. older/younger/people with disabilities etc.)?

‘The project enables one to meet other people who share a similar interest to “grow your own” and who may not be in your normal social circle. As a result you make more friends.’

Has working on the allotment changed your perception of others (e.g. stereotyping of particular groups)? If so, how does it help this to happen?

‘I am retired but in my working life, as well as daily living, one tends to meet people from all walks of life. You conclude that ‘everyone is different’. One is best not to be critical and just get on to enjoy the work and company, helping and supporting one another as needed.’

Has working on the allotment helped you to develop a sense of purpose (e.g. a role/aim in everyday life) and social acceptance (e.g. being accepted by those in your community and around you)? Do you feel that you are part of your community?

‘I have come to the allotment project to experience a new hobby…. The allotment is the ideal place where you learn from the “boss” and members of the project who may have come from outside your own neighbourhood’.

Has working on the community allotment encouraged you to volunteer on other community projects? If so, what are they?
'I have always done volunteer work since retirement, although not presently while coming to the allotment. I hopefully will do again in the future.'

Has working on the community allotment made you more environmentally friendly? If so, what new environmentally friendly behaviours have you adopted?

'The community allotment has made me more aware to be environmentally friendly. We follow the whole ECC recycling programme'.

Have you developed any new skills as a result of the community allotment project? What are they and how are they beneficial to your everyday life?

'I can’t say I have really, possibly because of age. Anyway, it is a wonderful project; bringing people in the community together to work and play (so to speak) and to enjoy the fruits of our hard efforts.'
5.2 Case Study 2- ‘Tom’

Tom had been attending the Clacton Digs It allotment for 18 months at the start of the GGT programme and was a committed volunteer who attended the allotment on a weekly basis. Tom completed a start and end of programme questionnaire, and also completed a follow-up questionnaire after not having attended the allotment over the winter. Tom also responded to a series of questions about the programme. The results are presented below.

5.2.1 Well-being

Tom’s well-being score was 42 at the start of the programme, increasing to 45 at the end of the programme; a 7.1% improvement (Figure 56). At follow-up after the allotment had been closed for the winter, Tom’s well-being decreased back to the start of programme score, indicating that his improvement in well-being was not sustained when he did not attend the allotment.

![Figure 56: Tom’s well-being scores at the start, end and follow-up phases of the programme](chart)

*Note: A higher score = better well-being*

5.2.2 Nature Experience

Tom did not complete the nature experience scale at the end of the programme. The score at the start of the programme was 4.2, increasing to 4.3 at follow-up (Figure 57). The score therefore increased by an index of 1.0 (23.8%), meaning that increases in experience and familiarity with nature was sustained over the winter period when Tom did not access the allotment. During the winter he may have also still accessed green spaces.
5.2.3 Physical Activity

At the start of the programme Tom reported that he performed one day per week of moderate physical activity indoors. By the end of the programme this had increased to five days per week, however at follow-up no indoor physical activity of moderate intensity was performed (Figure 58). Tom’s indoor physical activity dropped dramatically over the winter period. At the start of the programme Tom also reported doing seven days per week of outdoor activity, a figure that was also reported at the end of the programme. At follow-up this decreased to six days per week of outdoor moderate physical activity (Figure 58), however Tom was still performing high levels of outdoor activity during the winter and was meeting activity recommendations.
Tom’s sitting time decreased from 35 hours per week at the start of the programme to 28 hours at the end of the programme, representing a 7.0 hour reduction, equivalent to 20%. Tom also spent 28 hours per week sitting at the follow-up phase, thus the reductions in sitting time were sustained over the winter when Tom could not access the allotment (Figure 59).
5.2.4 Community Satisfaction, Safety and Belonging

At the start of the programme Tom’s safety and isolation score was 18, declining to 17 at the end of the programme. At follow-up the score has decreased even further to 15, representing a 16.7% reduction from start to follow-up. Tom’s safety decreased and isolation increased over the course of the programme, and particularly during the winter period (Figure 60).

![Figure 60: Tom’s community safety and isolation score at the start, end and follow-up phases of the programme](image)

Note: A higher score= reduced isolation and increased safety

5.2.5 Diet and Healthy Eating

Tom’s diet and healthy eating score was 13 at the start of the programme, but decreased slightly to 12 at the end of the programme. However at follow-up the score increased once again to 13. Tom’s diet and healthy eating was therefore sustained at follow-up (Figure 61).
5.2.6 Social Interaction

Tom social interaction score increased from 12 at the start of the programme to 14 at the end of the programme (Figure 62), representing a 16.7% increase in social interaction. At follow-up the social interaction score remained at 14, thus social interaction was sustained over the winter.
5.2.7 Intergenerational Links

Tom’s overall intergenerational score at the start of the programme was 7, increasing to 8 at the end and follow-up, representing a 14.3% increase (Figure 63). Intergenerational links therefore increased over the course of the programme and were sustained over the winter when there was no access to the allotment.

![Intergenerational Link Score](image)

**Figure 63: Tom’s intergenerational links score at the start, end and follow-up phases of the programme**

*Note: A higher score = more intergenerational links*

5.2.8 Qualitative Feedback

Tom’s responses to the qualitative feedback questions are displayed below:

**How has working on the allotment affected your health and well-being? How has it influenced factors such as physical activity and diet?**

‘I don’t think it has made much difference on my physical health because I was already a gardener when I started working on the allotment as I have my own garden. But as a volunteer I think it has made a difference to my mental health as I feel I am growing in confidence by helping others.’

**Do you think that working on the community allotment helps to reduce social isolation? How does it help people to feel part of their community?**

‘Yes I do. It can help bring people together who would not have otherwise met to work as part of a team with a common goal and sense of purpose. It can help people feel part of their local community, but it can also help people feel part of an alternative community which is not necessarily*
valued by conventional society—those who are interested in green issues as opposed to materialistic values.’

How has participating in the project helped you to meet people outside of your normal social circle (e.g. older/younger/people with disabilities)?

‘Well in previous jobs and voluntary work, I have met many people with mental health issues and learning difficulties, so I don’t really regard people like that as being outside my normal social circle. Also, I like older people, but so far we have hardly had any older participants on our allotment. One of our participants has Tourettes Syndrome and he has outbursts of swearing and spitting and I find it very hard to relate to him.’

Has working on the allotment changed your perception of others (e.g. stereotyping of particular groups)? If so, how does it help this to happen?

‘I already had an awareness of stereotyping, but I can see how some might come with preconceived ideas and may have their ideas challenged by seeing groups or individuals that they do not normally come across doing things they don’t expect them to do (for example asylum seekers being involved in gardening). So I think that stereotyping is overcome by people seeing the stereotyped group in unexpected places and through close contact with them to get to know them and see behind the stereotype’.

Has working on the allotment helped you to develop a sense of purpose (e.g. a role/aim in everyday life) and social acceptance (e.g. being accepted by those in your community and around you)? Do you feel that you are part of your community?

‘Yes, I do feel a greater sense of purpose by working on the allotment and it gives me something to talk about in conversation. Also, it helps keep me grounded and gives me a feeling of hope for the future. I feel only semi-detached to my local community, as I don’t feel I have a lot in common with conventional people. I feel more attached to my alternative community through membership of a green group.

Has working on the community allotment encouraged you to volunteer on other community projects? If so, what are they?

‘Yes. Since I started volunteering on the allotment, I have become involved in other community projects. I helped to set up a time bank and served on its steering committee. Ultimately, the time bank failed, but I learned a lot through my involvement with it. I am also involved with Foodcycle, which takes donated and unwanted food from supermarkets and shops and cooks meals with it for people living in food poverty in our local community. It is part of a national network which has been going for a few years, but ours which is called Grub Club, started last November. I am interested in healthy food, don’t like food waste and believe that in a wealthy community like ours people shouldn’t be going short of food, so this meets several criteria. I believe it is part of the same ethos at the community allotment scheme.’
Has working on the community allotment made you more environmentally friendly? If so, what new environmentally friendly behaviours have you adopted?

‘I was already very aware of environmental issues before starting on the allotment, and used organic methods in my own garden, recycled as much as possible, composted my kitchen waste, cycle rather than drive a car, and tried to reduce my carbon footprint as far as possible, so I don’t think working on the allotment has made me more environmentally aware. But it has made me more aware of the need to be thrifty, and this has occurred by meeting other allotment holders and seeing their makeshift structures and money-saving ways. I have adapted these ways to my own garden to some extent (i.e. making makeshift fences and compost enclosures out of wooden pallets which would otherwise be thrown away).’

Have you developed new skills as a result of the community allotment project? What are they and how are they beneficial to your everyday life?

‘I have developed some leadership skills as a result of my work on the community allotment and I use my initiative more. I am currently without a job and am carer to my mother who has dementia, but if I ever get a job again, I would like to use gardening in my work. In the past I have been a support worker with people with learning disabilities. In the future, if I was to return to this type of work, I would like to be able to do gardening with service-users as I think it is good therapy. I suffer with depression and gardening and nature helps me and gives me hope in a dark world. I believe it would help others too.’
6. Key Findings

- Participants from all allotment groups experienced increases in well-being, even though they reported slightly above average well-being scores at the start of the programme.
- Nature experience also increased and sitting time decreased, however this result only occurred in participants who completed the questions at both the start and end of the programme.
- Physical activity conducted indoors and outdoors decreased over the course of the programme; however participants were still meeting government activity recommendations despite this reduction. Furthermore, participants still performed more outdoor activity than indoors by the end of the programme. Outdoor activity may also have been affected by the weather and restricted access to the allotments over the winter period.
- Community belonging, neighbourhood respect and consideration increased as a result of attending the community allotment. Participants also felt less isolated within their communities, participated in community activities more, felt that they had people in their life that cared about them, met friends and relatives more regularly, and found it easier to meet new people. Thus by the end of the programme a greater proportion of participants were socially interactive.
- Interaction with people of other generations also increased. Participants felt they had greater opportunity to meet other generations through the GGT programme and that this interaction was beneficial for knowledge transferral and sharing of ideas.
- Gender or the allotment group attended did not significantly affect the change in any of the health parameters over the course of the programme.
- There were significant differences at the start of the programme in community safety and isolation scores depending on the length of time participants had been attending the allotment ($X^2(3)=8.0; P<0.05$). Those attending for more than 12 months or who had just started attending felt the most safe and least isolated within their communities. The mean scores for the participants who had just started attending the allotment, had been attending for 1-6 months, 6-12 months and 12 months+ respectively were 18.1±2.8, 13.7±4.5, 14.0±4.8 and 17.9±3.7 respectively.
- Time spent attending the allotment did not significantly affect any of the other health data collected at the start of the programme.
- For the two case study participants, at least one of the two sustained improvements in the health parameters six months after the end of the GGT programme. These improvements were also sustained over the winter when the allotments were closed. Participation in community allotment activities may therefore contribute to a sustained improvement in well-being, nature experience, community safety and isolation, social interaction, diet and intergenerational contact in the longer term.
7. Discussion and Conclusions

7.1 Discussion of results

The GGT programme evaluated the effect of attendance at community allotments throughout Essex on various health outcomes. Participants who took part in the programme experienced enhanced well-being and nature experience, which were two of the programme’s key objectives. This demonstrates that contact with nature through working on the community allotment helped to improve participants’ mental health state and increase their familiarity and experience of nature.

Another key objective was to increase physical activity levels. The number of days of indoor moderate physical activity increased over the course of the programme, whilst outdoor physical activity decreased. However, the decrease in outdoor physical activity is likely to be due to the fact that participants were already performing high levels of outdoor physical activity at the start of the programme, limiting opportunities for further increases. The decline in outdoor physical activity may also be due to changes in weather and season. As the programme progressed, the weather deteriorated as winter approached. Participants may have therefore been deterred from outdoor physical activity or prevented from performing physical activity outdoors due to the weather. Despite the decrease in outdoor activity by the end of the programme, participants still performed more physical activity outdoors than indoors. Furthermore, at both the start and end of the programme participants total physical activity (indoor and outdoor combined) exceeded the recommendation of at least five days of 30 minutes of moderate intensity physical activity per week.

In conjunction with the changes in physical activity, the time spent sitting also decreased over the course of the programme, representing a reduction in sedentary behaviour. Whilst this finding was positive, the results were only so for participants completing the question at the start and end of the programme. There was a large variation in the self-reported sitting time and therefore some question as to the reliability of the data. As with physical activity, the changes in season and weather may have also influenced sitting time.

Another key objective of the programme was to reduce social isolation and increase the opportunity for social engagement. Regarding community belonging and isolation, participants felt a stronger community belonging by the end of the programme and that their communities were places where people from different backgrounds could get on well together. More participants also told us that they felt part of their community. The GGT programme intended to bring communities together; the results suggest that this had been achieved. In relation to community safety there was little change in worries about crime and safety whilst walking in local communities. Many participants already felt safe walking in their communities at the start of the programme. However, those participants who had been attending the allotments for the shortest and longest time felt the most safe and least isolated in their communities.

The key objective of improving access to fresh fruit and vegetables and encouraging adoption of a healthier diet was also met. The healthy eating and dietary choices of participants improved over the course of the programme. By the end of the programme a greater proportion of participants thought
healthy food tasted nicer than unhealthy food and that they cooked their meals from basic ingredients. Eating healthy food was ranked the most important aspect of diet by the majority of participants. Thus, informal learning during time spent at the community allotments helped participants to enjoy healthier food and to cook their meals themselves using basic ingredients such as fresh fruit and vegetables that had been grown on the allotments.

By the end of the programme a greater proportion of participants were socially interactive. More participants felt that they had people who cared about them and that people in their local area all helped each other. A greater proportion of participants also agreed that they had chances to meet people with the same interests as them. The GGT project helped people from the same communities with similar interests to meet and thus helped to increase social interaction. The key objective of increasing scope for intergenerational activity was met as interaction with people of other generations also increased. Participants felt they had greater opportunity to meet other generations through the GGT programme and that this interaction was beneficial for knowledge transferral and sharing of ideas.

The benefits received from taking part in the GGT programme did not significantly differ between the different allotment groups or genders, indicating that both males and females who participate in any of the allotment groups will receive the same degree of benefits for health. Time spent attending the allotment also did not significantly affect the benefits received from participation. Participants who had been attending for short and long periods of time received a similar degree of benefits.

In relation to the case study participants, the follow-up results indicate that some of the benefits received from participating in allotment activities can be sustained, even when allotments are not available to participants over the winter months. For the majority of measures included in the questionnaire, either one or both of the case study participants maintained improvements in the health parameters over the winter.

7.2 Limitations of research

Whilst the benefits of the GGT programme have been shown in this report, there are however some limitations to the study. The small number of participants, particularly at the end of the programme, limits statistical analysis and comparisons. A greater number of participants would allow for more statistically powerful results.

There were also large standard deviations in many of the measured parameters, indicating that there was considerable variation in mean scores and changes in the variables and thus the effect of the allotment use. Since a large number of participants were already benefiting from spending time on the allotment prior to the start of the programme it is also possible that the benefits achieved from the community allotment had already been received and thus were not captured by the composite questionnaire. It would have been beneficial for all participants to have completed the questionnaire on their initial visit to the allotment. More longitudinal data would have also been
beneficial, as to date many of the studies evaluating the effect of contact with nature and participation in green exercise are short term.

7.3 Concluding comments

The overall results of the GGT programme suggest that working on a community allotment can provide benefits for physical and mental health and well-being, through improved diet and healthy eating, greater community belonging and satisfaction, with opportunities for community volunteering, intergenerational contact and social interaction. Community allotments successfully adopt an intergenerational approach to social activities, which actively encourage the ‘breaking down’ of barriers and challenge negative stereotypes and behaviour. These intergenerational activities encourage the sharing of knowledge and experience, facilitate informal learning and support a cycle of activity resulting in growing food together. Generations of all ages working and growing food together can act as a preventative intervention to potentially reduce the financial impact on social and health spend. Findings can also inform recommendations for future commissioning of mixed age community gardening groups and how to best meet the needs of communities. The research outcomes provide a better understanding of which approaches should be mainstreamed to ensure maximum health benefits for all. Thus, the use of community allotment projects such as Generations Growing Together should be encouraged to promote health and well-being within communities.
8. References


