Preliminary report on the Evaluation of the Greater Manchester Nutrition and Hydration Programme: (18/11/19)

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Executive Summary:

The report sets out the preliminary findings of the evaluation into the impact of the Greater Manchester Nutrition and Hydration programme in identifying and preventing malnutrition in older adults. The evaluation is based on data collected at week one and week 12 of the research study for 36 participants which shows that over 80% had a positive response to the intervention in terms of gaining weight or stopping weight loss. The report analyses how participants responded to the intervention and identifies where the programme was more likely to have had a positive outcome in terms of weight gain or maintenance. The report identifies a series of critical success factors for the intervention, the most important of these is the frailty level of the participants, many of whom are living with a significant health condition such as dementia. The other factors such as the participant's level of social isolation and access to services are shown to have a counterbalancing effect – enabling them to overcome their barriers to nutrition. The report includes a series of case studies which illustrate how these factors manifest themselves in the lives of the older adults and how the intervention has helped them overcome these barriers to nutrition. Finally, the report sets out what further work will be done into these preliminary findings to substantiate the early findings and create a robust database of evidence around the impact of the intervention for the participants.

Key findings from preliminary report:

Key findings 1: Identifying malnutrition and providing nutritional advice helps prevent malnutrition in older adults

Research suggests that using the PaperWeight Armband© with the other materials in the GM Nutrition and Hydration Programme have a made a positive difference in terms of weight gain or weight maintenance

Key finding 2: Clinical frailty is a big factor in how likely an older adult is of becoming malnourished and lowers their chances of being able to overcome other barriers to nutrition

The higher your frailty levels the less likely you will benefit from the intervention to prevent malnutrition. This is particularly the case for older adults living with a significant health condition such as dementia

Key finding 3: Social connectedness is a key factor in overcoming frailty and preventing malnutrition in older adults

Evidence suggests that attending lunch clubs, social activities or having a good network of family and friends has a significant impact on your ability to overcome barriers to nutrition including higher frailty levels

Key points from the evaluation:

- Recruited 83 participants, 75% of these are women and 30% are aged 85 or over – eldest is 99
- Recorded weights as low as 32kg and 16 below 40kg; 50 below 50kg

- 36 recruits have been followed up for 12-week review of these 86% have had a positive outcome from the intervention (recording either weight gain or no weight loss at 12 weeks)
- The mean weight gain was 1.59kg
- Frailty scores range from 1 to 8; 34 had a frailty rating of 6 or above
- Those with frailty levels of 5 or below were more likely to have a positive response to the intervention
- Cost Benefit Analysis for the programme used an assumption that 30% of people engaged would have a positive outcome

1. Background

Malnutrition amongst the general 65+ population is estimated at around 14% but can rise to as much as 35% prevalence dependent on setting (10-14% of older adults living in sheltered housing, 30% of hospital admissions and 35% in care homes, as estimated by BAPEN [British Association For Parenteral And Enteral Nutrition] / NICE [National Institute for Health and Care Excellence]). More than 90% of malnutrition is said to occur amongst people living independently in their own homes and communities which is why a community-level intervention is being recommended, to target the environments where it most commonly occurs. The other main advantage of a community intervention is that it is more likely to pick up and intervene in malnutrition earlier, therefore supporting better health outcomes and quality of life for the individual.

Although there is widespread acknowledgment amongst clinical practitioners about the value of nutritional screening, it routinely goes unrecognised and untreated. There are well-documented barriers to the use of clinical nutritional screening tools in routine day to day interactions with older people. The prevailing view seems to be that whilst GPs and nurses are best placed to screen, there are multiple barriers to doing this systematically including time constraints, lack of knowledge, low prioritization of nutrition, forgetting to screen, lack of suitable equipment and training, and this type of screening not being a mandatory requirement.

Simple-to-apply methods to identify the risk of malnutrition and dehydration at a community-level can therefore usefully supplement existing clinical screening practices and may be the key to addressing malnutrition risk more systematically and consistently at a population level.

The PaperWeight Armband©

The purpose of the Greater Manchester Health and Social Care Partnership Population Health Plan 2017-2021, is to raise awareness about the risks and signs of malnutrition and dehydration amongst individuals, carers and non-clinically trained practitioners who have routine contact with older people aged 65+. It is a classic population health intervention, in that it is designed to target a specific population cohort, to modify the incidence and mitigate the risks of malnutrition and dehydration, by intervening early and proactively.

The tool upon which the intervention is based is known as the PaperWeight Armband©, which has been developed and used over the past 3+ years by partners in Salford. The armband is a non-clinical and non-intrusive tool for identifying and dealing with the signs of malnutrition by measuring the non-dominant upper arm. It is a non-clinical, alternative measurement to BMI (Body Mass Index). The usual clinical tool is MUST (Malnutrition Universal Screening Tool) which is based on BMI measurement, but MUST does not lend itself to a community wide approach.

Once secured, if the armband slips easily up and down, this is a strong indicator of malnutrition. The practitioner will then be able to open up a conversation about diet, eating habits, help with eating, appetite, unplanned weight loss, and possible food solutions and provide/signpost the individual and their carers to advice and guidance on dietary fortification and nutritional self-care, including more routine issues such as shopping or food delivery/ordering. The QR code and website address, which are printed on the armband, link to a range of nutritional support materials on the AGE UK Salford website and allows carers and individuals the opportunity to self-manage for a 12-week period, if they cannot gain weight they need to visit their GP for further support or to be referred to a community dietitian.

Purpose and objectives of the evaluation

The evaluation comprised of a research study nested within the larger currently ongoing screening (non-research) project to evaluate the following:

- What is the impact of the intervention at an individual level?
- What is the feasibility of the roll out of the intervention in practice?

An independent, research-led evaluation of the project is important for several reasons:

- following the 2-year pump-priming funding period, and subject to the findings, the evaluation will be used to develop a case for further roll-out of the intervention across GM boroughs
- it will add to an evolving picture about the success and role of community/asset-based approaches to population health issues generally
- help to determine if some settings and approaches differentially support the impact and effectiveness of this intervention/programme
- to understand the softer issues or perceptions which make it easier or more difficult for older adults to maintain good levels of nutrition in the first instance; and then respond to advice or information intended to address an identified risk of malnutrition/dehydration
- it will add to our understanding of the health and wellbeing challenges faced by older adults, in the context of a rapidly growing older population and the significant health and social care needs of this population group

Future aims:

This is a small research study nested within an ongoing project and has some key limitations. To fully assess effectiveness prospectively a randomised controlled trial or an observational case-control study will be needed, with more data about the

clinical trajectory prior to screening, closer follow up of the participants (weight, food intake, health care utilisation, functional status). However, the limited funding (limited budget and short duration) from the Greater Manchester programme cannot support that. A more formal study (such as an NIHR Health Technology Assessment) will be essential for evidence-based policy making. The outputs from this research study will inform whether a larger trial is worthwhile and help inform its design and delivery.

2. Objectives

Primary outcomes:

- The primary outcome is to assess whether the sign-posting of individuals found to be at risk of malnutrition and the use of the PaperWeight Armband© leads to weight gain
- To investigate how advice and support around nutrition and hydration can help older adults reach and maintain a healthy weight

Secondary outcomes:

- Assess whether the sign posting of individuals at risk of malnutrition and the use of the PaperWeight Armband© prevents weight loss
- A descriptive account of the participants' characteristics
- Also, a qualitative study is embedded in this project, concerning experiences of the PaperWeight Armband© and signposting, identifying facilitators and barriers
- A set of recommendations on how the intervention can be improved based on the feedback of participants and partners

Study hypothesis:

- The screening and signposting of individuals found to be at risk of malnutrition will lead to weight gain as a proxy of improved nutritional status

3. Study methodology

Study design

Eligible participants who agree to participate in the study were recruited from six of the Greater Manchester boroughs already undertaking the screening project funded by the Greater Manchester Health and Social Care Partnership Population Health Plan 2017-2021. These were Bolton, Bury, Rochdale, Oldham, Stockport and Salford.

This is a nested research-based evaluation within that larger project.

The research will not involve the PaperWeight Armband© screening itself, this is underway in the larger project above: the research element is solely to look at whether it has had any impact.

Those found to be at risk of malnutrition were invited to take part in the evaluation study. The target was to recruit a total of 80 participants as this was deemed by the University of Manchester Research Team to be a sufficient number for identifying definitive trends, in terms of potential benefits or deficiencies in the intervention.

The screening person in the Borough team leading the initial conversation collected some basic information about the individual when they were identified to be at risk for malnutrition. The University of Manchester Research Assistant collected the following within 1 week of the initial conversation:

- Initial weight
- Consent to participate in University of Manchester evaluation
- Other services currently accessing
- Semi-structured interview to understand barriers experienced to maintaining good levels of nutrition and hydration

University of Manchester Research Assistant collected the following after 12 weeks following the initial conversation:

- 12-week weight
- Changes made to diet
- Accessing services from initial sign posting/referrals (Y/N)
- Accessing other relevant services (Y/N)
- Used PaperWeight Armband©
- Impact on visits to GP
- Impact on appointments with district nurse
- Do you feel you have benefitted from this intervention?
- Repeat semi-structured interview to understand barriers experienced to maintaining good levels of nutrition and hydration and what has changed

University of Manchester Research Assistant also carried out recorded audio interviews with around 8 to ten participants about their experiences of the programme and how it has benefitted their health and wellbeing.

University of Manchester Research Assistant will collect the following after 6 months following the initial conversation:

- Weight

Study location

All research procedures have been undertaken in the community places where participants were recruited, or by contact in their own homes.

Focus Groups

A series of focus group sessions were also held with the programme's partners in the participating boroughs. These were facilitated by the University of Manchester Research Assistant and explored the following questions:

- Where has the programme added most value for your services and clients?
- What has been the biggest barrier in implementing and making use of the programme?
- How effective has the PaperWeight Armband© and key questions been as an intervention for highlighting the risks of malnutrition?
- What would you like to see in developing the next stage of the programme?
- Do you think it is feasible to roll out this intervention at scale in your Borough?

4. Preliminary results

Initial Findings

A total of 80+ participants have been recruited into the research study with the first participant enrolled at the start of June and the last at the end of October. At the time of writing this report 9 participants have withdrawn at or before the 12-week stage of the study due to health reasons or in one case - bereavement. This is indicative of the frailty of the participants and the target user group for the intervention. To classify this frailty and its effect in relation to the intervention, the research assistant used the Rockwood Clinical Frailty Scale[1] as part of the process of identifying the barriers to nutrition.

Key points so far:

- Recruited 80+ participants, 75% of these are women and 30% are aged 85 or over – eldest is 99
- Recorded weights as low as 32kg and 16 below 40kg; 50 below 50kg, see **Figure 1**
- 36 recruits have been followed up for 12-week review of these **86%** have had a positive outcome from the intervention

[1] See Appendix Two for details on the **Rockwood Frailty Scale™** and how it is used to measure clinical frailty in older adults and those with dementia

- Frailty scores range from 1 to 8; 34 had a frailty rating of 6 or above at Week 1. Those with frailty levels of 5 or below were more likely to have a positive response to the intervention at the 12 Week stage, see **Figure 3**

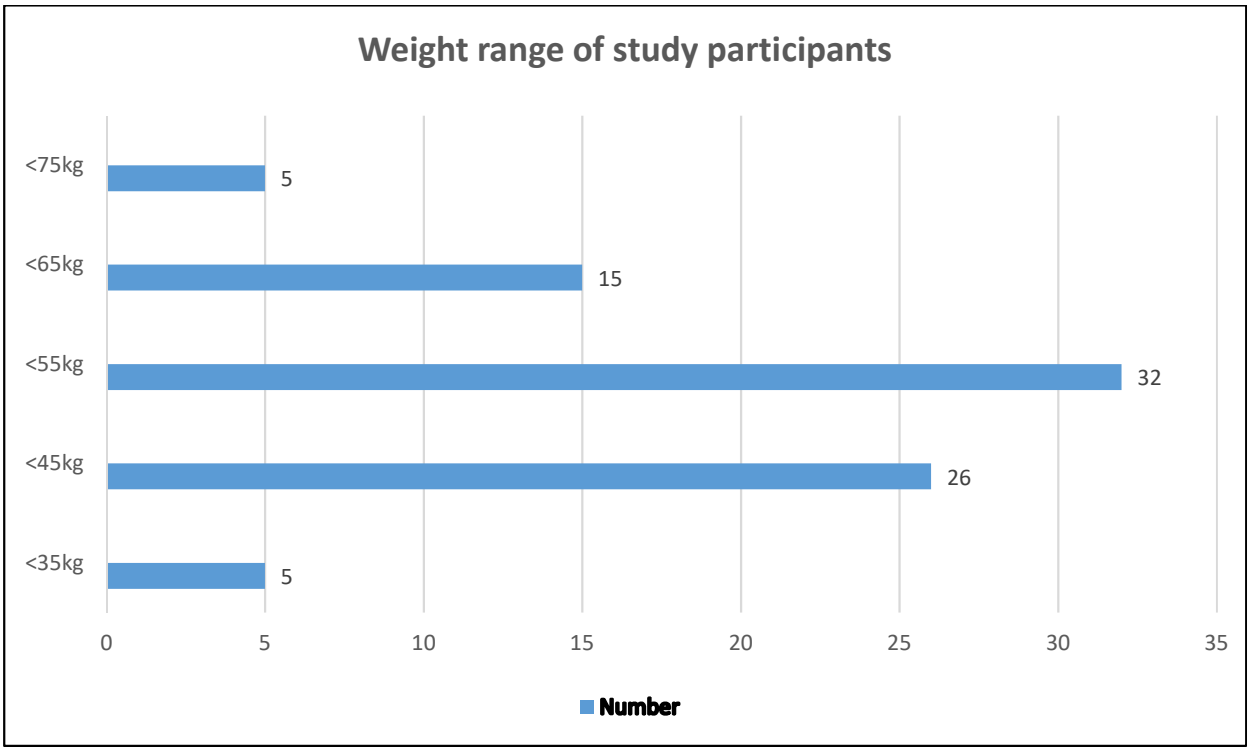


Figure 1

Results at 12 weeks:

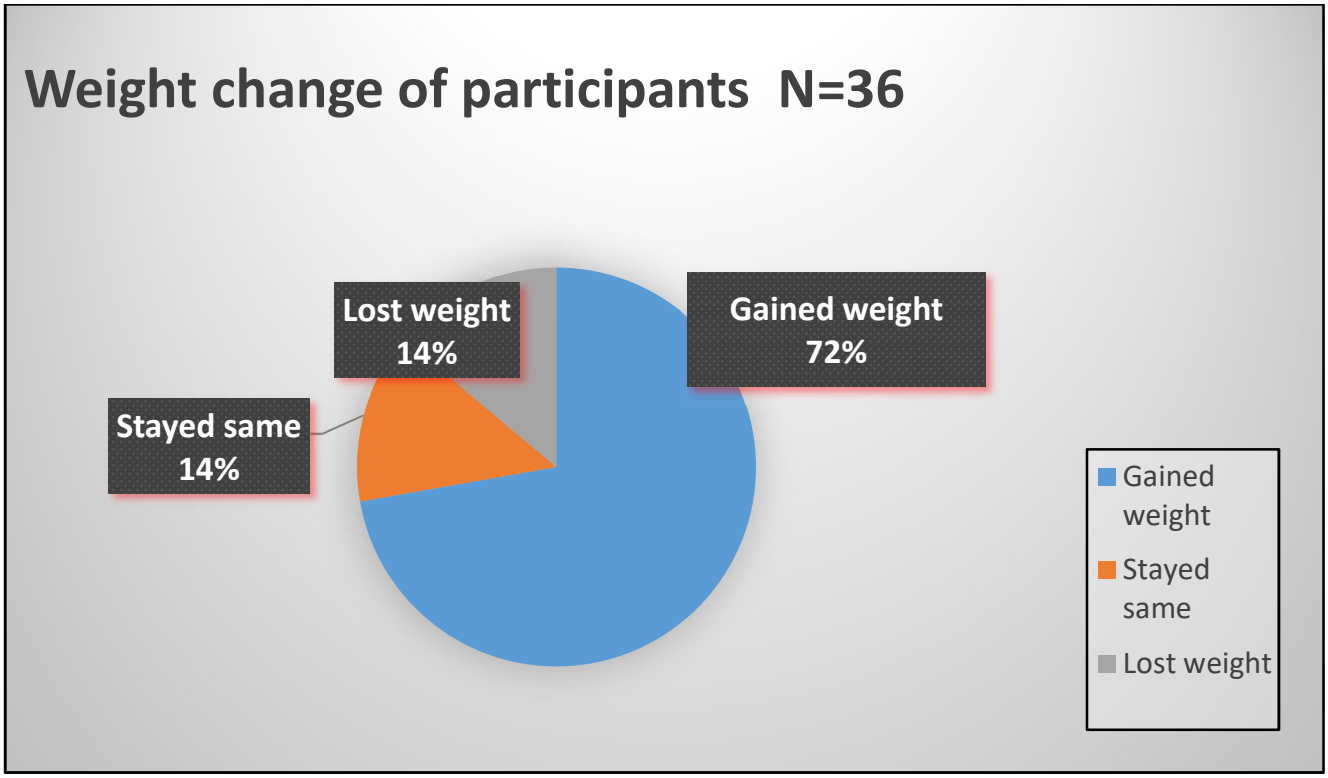


Figure 2

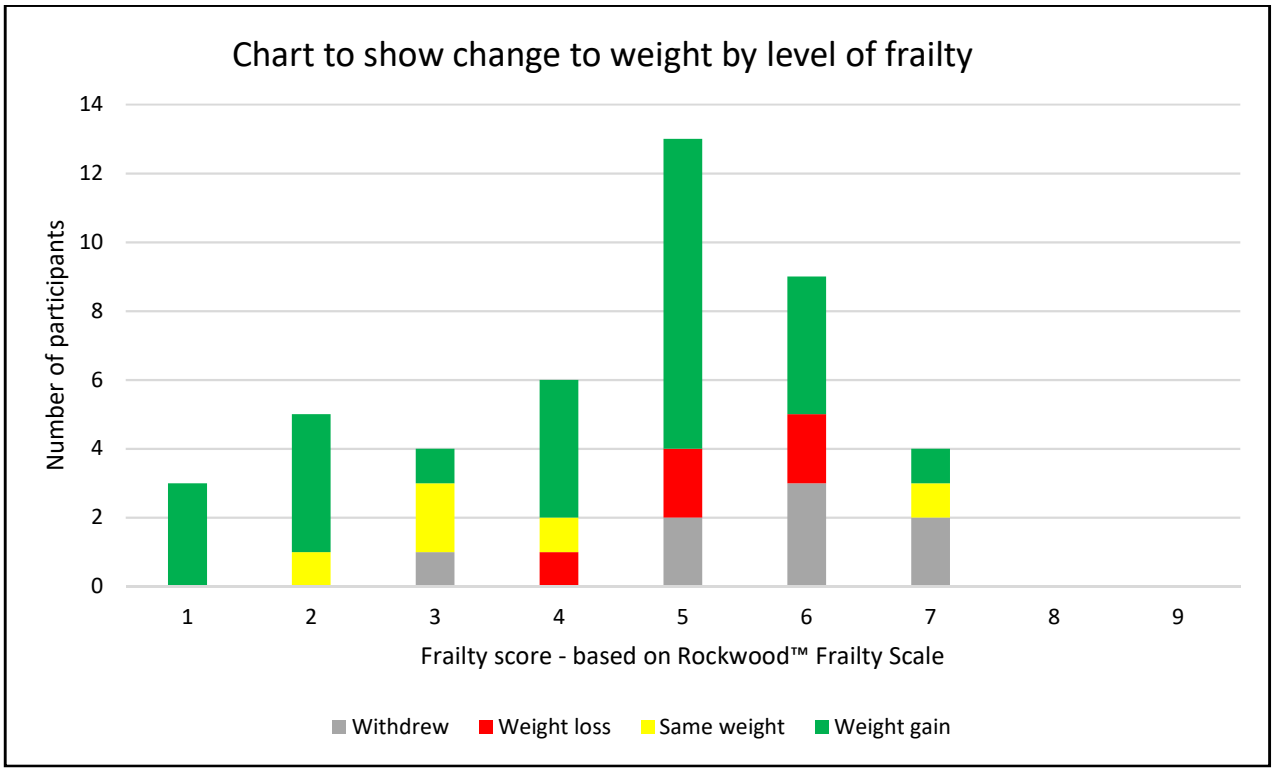


Figure 3

Positive Outcomes:

- Cost Benefit Analysis for the programme used an assumption that 30% of people engaged would have a positive outcome.
- In fact, the preliminary findings from the evaluation show that **86%** have responded positively to the intervention – recording either weight gain or no weight loss at 12 weeks
- So, we can start to say with some confidence that these simple conversations to raise awareness of this with older people can make a very big difference to their lives

Other findings:

- **Figure 3** illustrates the link between the participant's frailty level and how well they have responded to the intervention. Overall lower frailty ratings, 5 or below, improve the likelihood of a positive outcome
- The mean weight gain was 1.59kg and the mean weight loss was 1.72kg

5. Participant case studies

The case studies were chosen to demonstrate the range of experiences and barriers to nutrition faced by the participants. The material was collected in a series of interviews carried out by the Research Assistant at week one and week 12 of the intervention. It also includes in appendices a case study for one of the participants who withdrew from the study.

The studies support the findings from other recent research in the area of malnutrition among older adults such as the Glasgow University report for the Eat Well Age Well initiative in Scotland. As in Scotland the key themes to emerge from the case studies and the interviews with the other participants were:

- Weight loss is often associated with a traumatic event such as a fall followed by hospitalisation, an accident, bereavement or change of home
- Frailty levels of the participants are a significant factor in how they respond to the intervention
- Socialised eating and communal activities play an important role in preventing malnutrition. For many lunch and social clubs provide the most nutritious and enjoyable meal participants experience

- Around 25% of participants had a problem swallowing and digesting some types of food
- Heart attack or cardiovascular conditions result in dietary advice leading to severe reductions in fats and sugars even when weight falls below healthy levels

Case study 1: This is a 66-year-old woman who has multiple medical conditions and was knocked down by a car while crossing a road near home last Christmas. She suffers from a variety of vascular and gastrointestinal conditions as well as osteoporosis, which makes physical activity very challenging. She has to use a wheelchair and stick to help with her mobility but wants to be active and get to a gym to build up her muscle strength. She lives in her own home on her own but her son stays over a couple of nights a week, when she cooks a meal for him. Following the road accident, she was hospitalised and lost more than a stone in weight. The accident left her with multiple fractures in her leg and combined with her other medical conditions she struggled to regain the weight she lost in hospital. She struggles swallowing food and soon feels full when eating. Her weight at week one of the intervention was 45.8kg and using the Rockwood Clinical Frailty Scale she had a rating of 5 – mildly frail.

Following the intervention, she switched to adding powdered milk to her food and using full fat milk. She also started ordering ready meals from Wiltshire Farm foods. At 12 weeks she had gained 1.4kg and overall reported an improvement in her health and general wellbeing. She was well enough to go on two holidays to the Mediterranean, where the climate and meals out with friends helped her gain weight. Her motivation is to get fitter and start going to a local gym where she can build up the strength in her legs.

Key theme: Road accident triggered a series of events which lead to weight loss and growing frailty linked to cycle of health problems and loss of mobility.

Case Study 2: This is an 89-year-old woman from Rochdale. She lives in a sheltered housing scheme and her daughter who is a cook, helps with her meals and shopping. She suffers from COPD, asthma and acid reflux. Last year she fell and broke her hip. She has never drunk milk and always has water on her cereal. She likes butter and eggs as well as meat, fish and peanut butter. Her weight at week one was 44.5kg and her level of frailty was around 4 – vulnerable. At 12 weeks she had gained 2.2kg and she reported that this was linked to eating peanut butter by the spoonful and more nuts.

Key theme: Fall lead to broken hip and hospitalisation which resulted in loss of weight and increasing frailty. Nutritional advice combined with support from family and warden in sheltered housing complex have helped promote weight gain.

Case Study 3: Is an 85-year-old woman who has lost weight since her husband died about a year ago. She has been diagnosed with type two diabetes and is currently on a statin to manage her cholesterol levels. She attends a local knitting group which she enjoys and provides her with support and afternoon tea. The organiser of the knitting group had shared some concerns about her weight and general wellbeing, when the research assistant attended the group at week one. The armband was loose around her arm and when talking about her diet, she expressed much concern about her intake of sugar and fats. This was related to the nutritional advice she received on first being diagnosed with diabetes a few years earlier. When asked about what she was eating, she revealed that she ate a diet very low in sugar and fats. She did eat breakfast, often cereal with semi-skimmed milk, but little else for the rest of the day. Her weight at week one was 46.3kg and at week 12 she had gained 1.7kg. She reported back that she had been using milk powder to fortify her porridge and that she was also eating peanut butter as well more nuts, potatoes and other carbohydrates. Overall, she said that she was feeling healthier and better in herself which was confirmed in a conversation with the knitting group organiser. Her frailty rating moved from 4 at week one to 3 at week 12.

Key theme: Bereavement is a significant factor here in the participant losing an interest in eating and not feeling hungry. There is also a subsequent loss of role as the participant was used to preparing meals for husband and family. Anxiety around her own health has been translated into the way she has responded to the dietary advice from the diabetes clinic which may no longer be appropriate for her situation.

Case study 4: Are two sisters who live in a sheltered housing complex. One is 90 and the other 86, both have lost their partners but have daughters and other family who live nearby. The younger sister lost around a stone in the last year and has lost her sense of smell and appetite in this period. She has a heart problem and suffers from COPD. She attends her local Age UK Lunch Club with her sister, which is where she found out about the Nutrition and Hydration programme. Following the intervention, she gained 1.6kg which she linked to eating buttered malt loaf with honey or jam. Overall, she said that she was still feeling tired and her energy levels were low. She also said that she had dizzy spells and had fallen over but had not needed to go to hospital. Her older sister is less frail than her and is still driving, mainly on Sundays when she takes her sister to a park in a nearby town. She weighed 59.9kg at the start of the intervention and was 60kg at 12 weeks. She lives very independently and does all her own shopping. She has been adding powdered milk to her food and has been eating nuts. She suffers from reflux and has problems swallowing her food. She also has problems with her colon and often feels full quickly. Overall her health and strength has been good, with a frailty rating of 3 (managing well) compared to 4 (vulnerable) for her sister.

Key theme: Importance of socialisation and mutual support in combatting malnutrition. Attendance at Age UK Lunch Club and the way these women support each other is a model of how to maintain independent living and tackle frailty.

Case study 5: Is a 72-year-old retired social worker. He lives alone and smokes 5 or 6 rollup cigarettes per day. He has been trying to stop smoking and saw the advert for the Nutrition Programme at his local Age UK office. He is generally in good health and feels he has not lost weight. Has had problems walking but still able to walk his dog several times a day and has a low frailty rating of 2. At week one he weighed 59.4kg and the armband was loose. He fully engaged with the nutritional advice, adding milk powder to the cereal and ensuring he was eating more regularly and larger portions. He has also been making sure that he has been drinking plenty of fluids. The result is that at 12 weeks he has gained 3.2kg and found his energy levels have increased. However, he is still smoking and reports his appetite is still the same.

Key theme: Smoking and living alone are key factors here in the man losing weight and not eating properly. His motivation to be able to walk his dog should not be underestimated and has led him to take action about his smoking and weight loss.

Case study 6: This is a 70-year-old woman from a town in Bury who has COPD, osteoarthritis and is a heavy smoker. She smokes between 20 and 40 cigarettes per day and has a very poor appetite. She is cared for by her daughter and a neighbour who is also a key holder. She is on Complan© food supplements and struggles to eat any food without feeling sick. At week one she weighed 36.5kg and the armband was loose. Her flat was poorly ventilated as she had a phobia about insects and the premises smelt heavily of cigarette smoke. When we visited at week one there was a full ashtray beside her chair which she spends most of the day sitting in. For the 12-week follow-up, the research assistant arranged with the daughter to meet him at the participant's home. The daughter did not attend however the neighbour was able to talk to the participant and let him into the premises. The woman was sitting in the same armchair with a full ashtray beside her and the house smelt heavily of cigarette smoke. She did have a glass of squash beside her as she is aware that she needs to keep up her fluid levels. She reported that she still struggles to eat any food without feeling sick and is still on Complan© for her weight. However, her weight at 12 weeks had gone down to 35.4kg and her frailty rating was in danger of moving from 6 (moderately frail) to 7 (severely frail). It was clear the nutritional advice was not being retained by the participant and those caring for her were struggling to reinforce the messages around her nutrition. The Staying Well Co-ordinator who had the initial conversation with the person was informed of this, to initiate a referral to the GP.

Key themes: Mental health issues and heavy smoking have created barriers to nutrition and frailty levels beyond the capacity of this programme alone to resolve. Social isolation has further compounded the problem, as the participant would need a far higher degree of support and care, combined with other interventions to benefit from the programme.

More case studies are included in the appendices of the report, for some of these 12-week data was not available at the time this report was written.

6. Feedback from professional partners and stakeholders:

A series of focus groups were held with the professional partners and stakeholders for the GM Nutrition and Hydration programme. These were facilitated by the University of Manchester Research Assistant with the purpose of having at least one focus group in each of the participating boroughs. These were attended by managers Age UK Salford and senior staff from the local authority care and housing teams. There were also feedback forums set up with community dietitians and staff from NHS primary care services.

The main themes to emerge were:

- Intervention has been welcomed by staff and managers and there is growing sense of the value it is bringing to services and clients – particularly how it promotes independent living
- Frontline staff find the tools useful in opening up a potentially 'sensitive' conversation about healthy weight and malnutrition
- The role of the Age UK Programme Manager is fundamental to the successful introduction and development of the intervention
- Opportunity to develop peer to peer training and local champions to support the growth and integration of the programme
- The intervention is a more natural fit for staff in sheltered housing schemes than careline staff, as they already have a remit about knowing the person and the state of their property
- Still much work to be done with community dietitians and primary care so they can fully engage with the intervention
- Universally positive feedback around the PaperWeight Armband©, many said it felt very different to the MUST test. It also gave staff a simple tool which gave them confidence to talk about weight and malnutrition
- Stakeholders want to see the programme continuing and they value having access to quality information, expertise and support
- Best way to demonstrate the value of the programme is to provide cases studies and create a database of evidence showing how the intervention has improved people's nutrition and health

What they said:

“The intervention has helped uncover lots of undiagnosed and undetected risk in malnutrition.”

“It is really making a difference.”

“It (the armband) feels completely different to MUST. It can be more relaxed, informal, and easy to do. Giving people confidence that their concerns are valid.”

“It would still have a positive impact but not the same level of impact without the Programme Manager.”

“It is a fantastic programme, has done everything we hoped for but needs to continue.”

“Case studies bring the data to life. Evidence base to show there is an issue and the approach we are taking is helping people live independently and promotes independent living.”

“People eat better when they are not lonely. You eat better with friends, companionship and support, creates a positive circle. The programme could increase the profile of social eating opportunities for people at risk.”

“Pleasantly surprised with how the home care provider forum took it on.”

“It has been surprising which teams have picked it up well, such as exercise referral services.”

“It’s an important message to get across that ***losing weight is not a natural part of ageing****.”*

At the time of writing this preliminary report further focus groups were set to take place with NHS Providers and Commissioners, as well as Community Dietitians. Feedback and key themes from this will be included in the next evaluation report.

7. Critical success factors:

The case studies and the feedback from the intervention’s partners has indicated that there are a common set of factors needed for the intervention to be successful, as measured by weight gain or weight maintenance. These are:

- The frailty level of the person
- The individual’s level of social isolation

- The living conditions – in terms of independent, sheltered or supported accommodation
- Access to support services, such as NHS and local authority provision

The Frailty Factor:

Based on the data collected at 12 weeks a clear correlation is starting to emerge between clinical frailty and the participants' response to the programme. Of those who took part in the programme with a frailty rating of 1 to 5, all of them benefitted from the intervention in terms of weight gain or maintaining weight. Of those who lost weight or who withdrew from the study all had frailty ratings 6 or above, see **Figure 3**.

Also apparent from the data is that it is possible to have a successful outcome from the intervention with a comparatively high frailty rating (6 or above) and these ratings can move even during the 12-week period from first interview.

For example, in Case Study 3 the woman's frailty rating moved from 4 to 3 as her nutrition levels started to improve. In another case an 83-year-old woman in supported accommodation with a Frailty rating of 7 gained more than 3kg but this was due to further nutritional interventions by the care staff. I recorded another woman with a frailty rating of 6 who gained weight but reported taking food supplements outside the nutritional advice of the intervention.

What is clear is that the higher the Frailty Factor, the higher the chance of little or no benefit from the intervention, unless other factors are present to offset the effects of the person's level of frailty. These other three factors – social isolation, living conditions and access to services – can make a significant difference in enabling the person to overcome what are often substantial barriers to nutrition.

Social isolation:

High levels of social connectedness do not in themselves prevent individuals from becoming malnourished but they are a common factor in helping identify and reverse the trend of weight loss. Interviews with participants and the case studies reveal how attendance at social groups and particularly those linked to communal eating have helped participants maintain weight and spot unintentional weight loss. Failure of participants to attend these groups is itself a trigger for concern among organisers who play a key, yet informal, role in helping monitor the attendees' health and wellbeing. In some cases, the organisers have themselves been surprised at the level of malnutrition present in the group, which has been signposted by the PaperWeight Armband©.

In Case Study 3 the social group organiser played a significant role in signposting the individual to help for weight loss and identifying the anxiety around eating food with high fat and sugar content. In Case Study 5 it is the Stop Smoking Group, which connects the participant who lives alone, to the nutrition programme. This alerts him to the fact that his weight is low and he may not be eating enough.

In Case Study 4 it is the mutual support the sisters can provide for each other, combined with the Age UK Lunch Club which helps keep their weight at healthier levels. In all around 30 of the research participants were recruited through lunch clubs or social groups. Only two of these lost weight and two withdrew because of ill health, the rest have either gained weight or maintained weight levels so far in the study. The evidence base suggests activities which promote social connection are fundamental to helping tackle the barriers to nutrition.

Living Conditions:

Independent living was often the preferred choice of many of the participants and many of these used different forms of support services such as a domiciliary carer to remain living in their own home. Overall the evidence base from the study shows that those living independently have much lower Frailty ratings and are generally better able to overcome potential barriers to nutrition. However, Case Study 7 in the appendices highlights how this can quickly change if a person is living alone and becomes unwell, then you can become vulnerable to malnutrition and growing frailty. This was also the case in Case Study 1 and Case Study 5 where the individuals found a deterioration in their health had put them on a pathway to weight loss, frailty and growing isolation. All this made independent living a challenge and even a substantial barrier to nutrition and their health in general.

More than half the participants in the study lived in some form of sheltered housing, with access to on-call help via a care line or on-site warden. In two cases the on-site warden signposted potential people at risk of malnutrition and had noted changes in behaviour, such as withdrawal from social activities. Both these participants had frailty ratings between 5 and 6 and both responded well to the intervention, gaining over 2kg. Some of the facilities also had on-site restaurants and lunch clubs which promoted social eating.

Around a quarter of the participants lived in supported housing. These tended to have the highest frailty ratings and where some of the lowest weights were recorded. In one case a 75-year-old man weighing less than 40kg and an 89-year-old woman who weighed 36kg. In some of these facilities staff did keep a check on the weight of the residents but in others they had no facilities to do this. In many of these cases the involvement of family members was fundamental to the success of the intervention, as they provided an extra level of support to overcome the barriers to nutrition.

Access to services:

Access to support services from either the local authority, NHS or third sector kept occurring as a key factor in the signposting of malnutrition and the promotion of the Nutrition and Hydration Programme. Many of the participants were signposted through the Living Well and Staying Healthy services run by the local authorities. One of the themes which came up in the focus groups with the partners was the need for access to high quality information about diet and nutrition, this is critical both at the individual and strategic level. From the evaluation it is clear many people are accessing their information about diet and nutrition from these support services. For example, the BEATS service in Bury which began as an exercise referral initiative, has embraced the Nutrition Programme and made it a core part of its offering. One of the areas for development in the programme will be to build on these partnerships with local authority and NHS services.

For the participants involved in the evaluation being well connected to these services is a significant factor in overcoming barriers to nutrition. For example, in Case Study 1 it was the local authority's Living Well service which originally handled the referral to the intervention and is continuing to support the individual on the path to recovery. What is striking about these services is their focus on the whole person, making them an ideal partner for this programme. This was also highlighted in one of the focus groups where the manager from the local authority Staying Well service said their 'holistic approach' makes it easier for them to take on the programme.

The results in the areas where these services are accessible suggest they are having an effect in tackling malnutrition and preventing people from becoming more seriously ill as a result of frailty and weight loss. So far there is only 12-week data for 36 participants but of the 26 who have gained weight at this stage, 20 of them have regular contact with at least one of these local authority or third sector services. This also includes Day Care Centres, Community Cafés and Exercise/Relaxation Classes.

8. Preliminary conclusions:

Primary outcomes

It is clear from the evidence already collected at 12 weeks that the intervention and the use of the PaperWeight Armband© is leading to weight gain and is measurably making a difference to the health of older adults. While this data is very much preliminary and the numbers are relatively small, the trend is clear. More than 85 per cent of participants are either registering weight gain or no weight loss, meeting the primary endpoint of the intervention. This needs to be confirmed with the remaining 44+ to be seen at 12 weeks and where possible followed up at six months to see how this trend is sustained.

Interviews with participants at one and 12 weeks also has revealed how the intervention is making a difference to the way they think about nutrition and manage

their diet – with a focus on maximising their intake of the most nutritious foods. A further set of audio interviews are due to take place over the next six weeks, which will explore this in more detail as well as how the intervention has helped them reach and maintain a healthy weight.

Secondary outcomes

It is also clear from the evidence base collected so far that the signposting of individuals at risk of malnutrition and the use of the PaperWeight Armband© is helping to prevent weight loss. Again, this will need to be verified with the 44+ to be followed up at 12 weeks and where possible at 6 months.

In terms of recommendations on how the intervention can be improved this will be included in the next report once feedback has been collected from all the partners and most of the 12-week interviews have been complete. Provisionally the areas for consideration will be:

- How the benefit to the participants can be sustained
- How partners can integrate and embed the intervention in their own services
- How dependent are partners on the Age UK Programme Manager for the intervention's success
- How can the PaperWeight Armband© be developed as a tool for signposting issues around weight and malnutrition

9. Appendices: appendix one

Report case studies

Case Study 7: Is a retired teacher from Stockport aged 74. She lives alone in her own home and can drive herself to do her shopping and meet with friends. She suffers from IBS and has noticed a modest decline in her weight and appetite. Often, she feels disinterested in food and does not want to prepare a meal just for herself. At week one she weighed 50kg and at week 12 she had gained a kilo after changing her eating habits and following the dietary advice in the Nutrition Programme booklet. She said that she liked eating finger foods and had been eating more nuts, cheese and dairy. Her frailty rating is around 1 to 2.

Key theme: Priority for participant is to maintain her independence and loss of interest in food could have led to a downward spiral in her health

Case study 8: This is a mother and daughter from Rochdale. The mother had a fall about a year ago and was hospitalised with cracked ribs and went home to recover

where she is cared for by her daughter. She lost weight during this time and has struggled to put it back on. All her meals and shopping are done by her daughter who lives nearby. She rarely finishes what she starts to eat and has little interest in food. The 97-year-old is very frail on her feet and is on medication for her heart and kidneys. She is completely dependent on her daughter for personal care and also attends a local day centre once a week. On the Rockwood scale she would be classified as 7 – severely frail. Her daughter is 68 and is very fit and active, attending Zumba classes and running. She is a trained dancer and has always been her current weight of 44.5kg, which is 10kg more than her mum. She has not suffered any weight loss or decline in appetite and eats a diet high in fruit and vegetables and low in sugar and fats. This means she has a marginally low BMI and could become underweight very quickly so maintaining a healthy weight is an important priority for her and her lifestyle. 12-week outcomes for this case study were still pending at the time of writing this preliminary report.

Key theme: How does the relationship between the mother and the daughter impact on how they respond to the intervention. Who cares for carers who are older adults and help them spot the risks of becoming malnourished?

Case study 9: This is an 85-year-old man from the Oldham area who was widowed a few years ago. In 2015 he had a heart attack and attends a healthy heart clinic. He has been diagnosed as pre-diabetic and given dietary advice to avoid high fat foods and high sugar. He does have mobility issues following a back operation which affected his spine. He lives alone, is able to drive in a converted care and does his own shopping and cooking. He has a high quality of living including walking holidays in the Lake District and being an active member of a local art group. He tries to eat a healthy diet but is aware that he has been losing weight and that the dietary advice from the healthy heart clinic is not suited to his health needs. He weighs 66.7kg and the armband goes around his upper arm. Besides the healthy heart clinic, he also attends the pre-diabetic clinic in his village. His frailty rating is 1 to 2. At the time of writing this report the 12-week data point had not been reached.

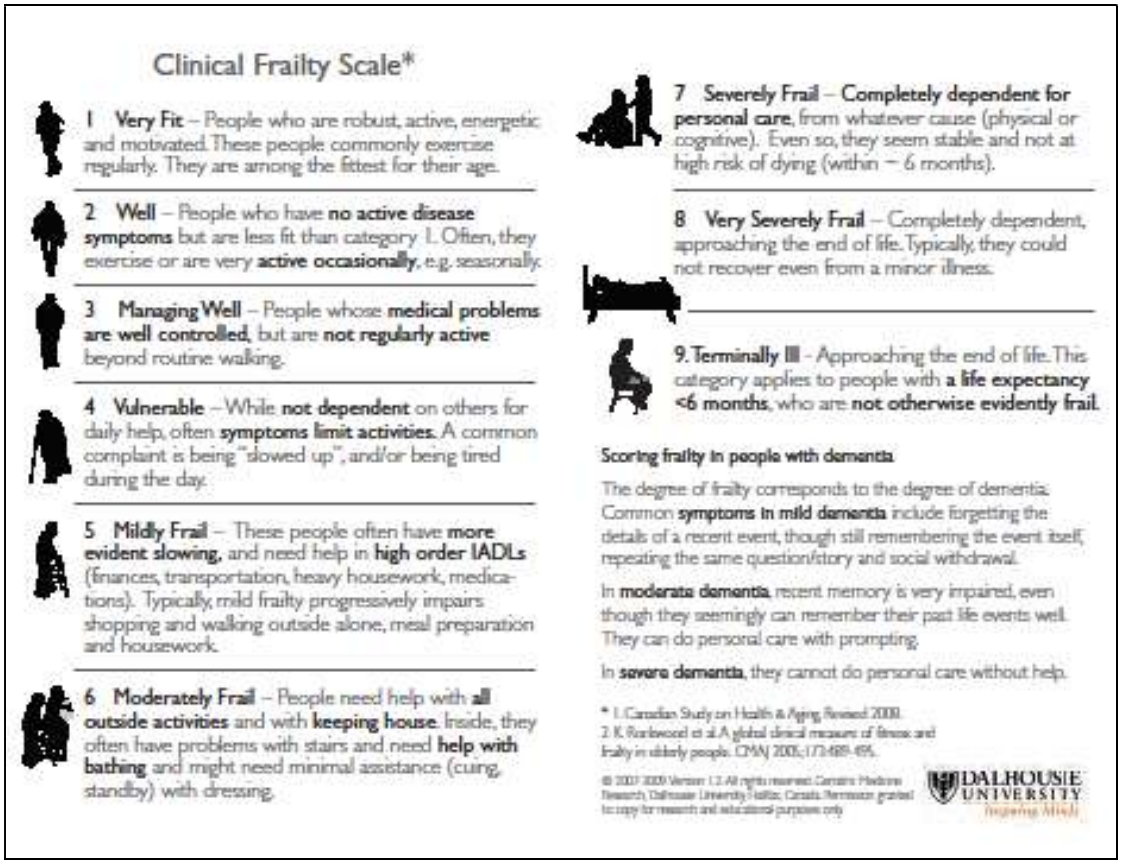
Key theme: Importance of independent living, access to good quality local services as well as high social connectivity have all helped participant overcome significant health problems.

Case study 10: Is an 82-year-old man who lives alone in his own home in a semi-rural location and has withdrawn from the study. He has a heart condition and a chest infection and has become frail with a rating of 6 to 7, while living in his own home which is in a poor state of repair. When the research assistant visited the participant on a hot day in the middle of summer, the gas fire was on in the front room. The participant is estranged from his family and relies on professional Carers for most of his shopping and cooking. The house had very limited cooking facilities but the care agency had arranged for him to have a microwave oven. At week one

he weighed 42kg and the armband was very loose. At 12 weeks it was difficult to contact him as he was not answering his phone. On contacting the care agency, they reported similar difficulties in contacting the client. A few days later the agency said they had managed to speak to him and he no longer wanted to be part of the study. They did agree to try to weigh him to see if he had gained weight, but so far there has been no further contact.

Key theme: Social isolation and poorly adapted living conditions have compounded the medical problems faced by this man who is increasingly trapped in cycle of frailty and malnutrition. Difficult to see how intervention alone could reverse this.

Appendix two: The Rockwood Clinical Frailty Scale™ was chosen as an internationally recognised measure to identify the frailty level of participants. This is in line with the recommendations of the GM Frailty strategy, **Resilience and Independent Living in GM** and the adoption of GM Frailty Standards to prevent malnutrition in older adults. The table below, sets out how the Rockwood Scale™ is calibrated and used in practice.



Clinical Frailty Scale*

1 **Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

2 **Well** – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.

3 **Managing Well** – People whose **medical problems are well controlled**, but are **not regularly active** beyond routine walking.

4 **Vulnerable** – While **not dependent** on others for daily help, often **symptoms limit activities**. A common complaint is being "slowed up", and/or being tired during the day.

5 **Mildly Frail** – These people often have **more evident slowing**, and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

6 **Moderately Frail** – People need help with **all outside activities** and with **keeping house**. Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.

7 **Severely Frail** – **Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

8 **Very Severely Frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

9. **Terminally Ill** - Approaching the end of life. This category applies to people with **a life expectancy <6 months**, who are **not otherwise evidently frail**.

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

* 1. Canadian Study on Health & Aging. Revised 2008.
2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

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For the study the University of Manchester Research Assistant used observations and feedback from the interviews at Week 1 to assign each participant with a frailty rating and this was reassessed at the Week 12 interview.