




Study of the Older Adults' Motivators and Barriers Engaging in a Nutrition and Resistance Exercise Intervention for Sarcopenia: An Embedded Qualitative Project in the MilkMAN Pilot Study

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Abstract

Objectives: The present study aimed to investigate motivators and barriers to older adults engaging in a nutrition and resistance exercise (RE) intervention for sarcopenia. **Methods:** We conducted a content analysis of structured interviews with 29 community-dwelling older adults (aged 65–80 years) completing the Milk Intervention Muscle Ageing (MilkMAN) study. **Results:** Content analysis revealed that self-perceived improved health, knowledge acquisition in nutrition and exercise, social well-being, professional support in a fun environment, and positive reported outcomes were motivators for engagement in the intervention. Peer encouragement, social bonds, and their retention were motivators to continuing engagement after study completion, especially in widowed women. Barriers to maintenance included affordability, environmental factors, and concerns over negative health outcomes. **Discussion:** Nutrition and RE interventions for sarcopenia should focus on knowledge acquisition about their health benefits, being enjoyable, and offering social opportunities that have the potential to last beyond the study duration to promote and maintain positive health behaviors.

Keywords

older adults, sarcopenia, resistance exercise, nutrition intervention, content analysis

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Introduction

The beneficial effect of resistance exercise (RE) for skeletal muscle health and physical functioning in older adults is well recognized (Cruz-Jentoft et al., 2014; Marzetti et al., 2017). It may be further enhanced by ensuring adequate protein intake (Cermak et al., 2012; Deutz et al., 2014), preferably from sources with high biological value protein that are inexpensive, easy to prepare, and well tolerated (Chernoff, 2004). However, further research is required to determine the most effective nutrition and exercise intervention(s) to ameliorate the loss of muscle strength and mass (sarcopenia) (Cruz-Jentoft & Sayer, 2019) that are also feasible and acceptable to older adults living in the community (Cermak et al., 2012; Cruz-Jentoft et al., 2014). Specifically, few intervention studies have used a whole food approach and combined protein-rich foods that are readily consumed by older adults with RE as a countermeasure for sarcopenia (Daly et al., 2014; Kukuljan et al., 2009).

In addition, there are challenges associated with older adults taking part in such interventions. For example, research conducted with community-dwelling older adults participating in RE interventions recognized the following barriers: (a) time constraints (the amount of time required to travel to an exercise facility and the time to perform exercise; Chao et al., 2000), (b)

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environmental factors (access difficulties to facilities and open spaces, lack of transport; Crombie et al., 2004; Moran et al., 2014), (c) health-related factors (comorbidity, pain/discomfort, concerns about falling, physical limitations; Cohen-Mansfield et al., 2003; Crombie et al., 2004; Franco et al., 2015), and (d) lack of interest and knowledge (no interest in physical activity, dislike of going out alone, and doubts about health and social benefits of exercise; Crombie et al., 2004). Conversely, motivators included social support (valuing interaction with peers and social encouragement), being familiar with the exercise task, exercise conducted by professionals (Damush et al., 2005; Franco et al., 2015), and receiving information about the benefits of exercise or recommendations from a physician (Cohen-Mansfield et al., 2003). Exercise studies have shown that older adults are able to maintain exercise once the activity has been mastered, with substantial improvements in self-esteem and self-worth observed (Franco et al., 2015), especially in older women (Conn et al., 2003).

Studies that do combine protein-rich supplements with RE are often randomized controlled trials (Denison et al., 2015), which lack data on the motivators and barriers of compliance with interventions. One qualitative study, embedded in a nutrition (protein-rich diet)-RE intervention, identified motivators to compliance with a protein-enriched product regime, including fit with existing habits and routines, knowledge of the health benefits of adhering to the recommendations, desire-inducing properties of the products (mainly taste, but also packaging), satiating properties, and convenience of use (Herrema et al., 2018). The motivators of RE compliance included the social aspect of the intervention and physical improvement. For continuing engagement after the study completion, participants were motivated to continue in the future due to satisfaction with the intervention; however, the high costs of both protein-rich products and visiting a gym were cited as major barriers to continuation with the intervention (Herrema et al., 2018). Understanding the motivators and barriers to engaging in a nutrition and exercise program will provide useful insights into intervention design to enhance compliance and encourage maintenance of behaviors postintervention in older people at risk of sarcopenia.

We conducted a pilot study (Milk Intervention Muscle AgeiNg [MilkMAN]) to examine the feasibility and acceptability of a milk in combination with RE intervention for sarcopenia with an embedded qualitative investigation to explore participants' views about taking part in such intervention in the community (Granic et al., 2019). The present study had the following aims: (a) to investigate participants' experiences of taking part in the intervention, including (b) the motivators and barriers to continue in the study, and (c) to engage in the nutrition and exercise program after the study completion.

Method

Design and Procedures

The MilkMAN pilot study involved 30 community-dwelling older adults (18 men and 12 women) who were randomized into three intervention groups: "whole milk (3.6% fat) + RE" (Group 1), "skimmed milk (0.3% fat) + RE" (Group 2), and "control drink + RE" (Group 3). Control drink (cranberry juice) was supplemented with maltodextrin to match the caloric value of whole milk. Approximately 1 week following completion of the 6-week intervention delivered twice-weekly in a local gym, a home-based postintervention interview was conducted to understand participants' experiences of taking part as well as the motivators and barriers to continuing the intervention after the study completion.

A full description of the MilkMAN study (trial registration number: ISRCTN13398279), including recruitment, data collection, nutrition, and RE program and data analysis can be found in the protocol paper (Granic et al., 2019). All participants provided written informed consent prior to study enrolment. The study was conducted according to the World Medical Association Declaration of Helsinki and approved by The North East–Newcastle and North Tyneside Research Ethics Committee 1 (18/NE/0265).

We followed the Standards for Reporting Qualitative Research (SRQR) guidelines to report this content analysis study (O'Brien et al., 2014).

Trained researchers (a health psychologist [L.D.] and exercise physiologist [C.H.]) conducted the postintervention interviews. Participants were asked a combination of structured multiple-response and standardized open-ended questions. While a structured approach is more rigid with all participants asked the same question in the same order to obtain brief answers (Qu & Dumay, 2011), open-ended questions allow for a deeper understanding of the responses obtained from structured questions.

Participants' responses to 11 open-ended questions (Appendix 1) were recorded verbatim pertaining to (a) overall experience in the study (probing for what they liked/enjoyed or disliked/found difficult), three questions; (b) attitudes and barriers to consuming 2×500 mL milk/control drink intake postexercise (e.g., volume of liquid, taste), two questions; (c) changes in appetite and habitual diet because of milk/control drink intake, two questions; (d) opinions about the feasibility/acceptability of the intervention (milk + RE) for muscle health in older adults, one question; (e) intentions to continue the intervention on their own after the study completion (probing for motivators and barriers), two questions; and (f) any additional comments or thoughts about the study. For example, after answering the multiple-choice question probing for changes in appetite, participants were asked to elaborate on their response: "You said that drinking this amount of milk/ juice affected your

appetite. In your own words, could you please tell me how your appetite was affected?" The postintervention home visits lasted approximately 30 min.

Participants

Participants were from the MilkMAN pilot study and the eligibility criteria have been described in detail elsewhere (Granic et al., 2019). Of 30 participants who were interviewed at baseline, 29 completed the 6-week intervention and took part in the postintervention home-based interview. One male participant in Group 1 withdrew from the study because of health reasons not related to the intervention.

Participants were characterized by sociodemographic and health-related variables (Supplementary Table 1). Sociodemographic characteristics included age, sex, marital status, occupational class (based on the National Statistics Socio-economic Classification (Chandola & Jenkinson, 2000)), and total years of education. Health-related variables were self-rated general health, number of chronic diseases (diagnosed by doctor), body mass index (BMI; assessed by bioimpedance Tanita MC-780MA body composition analyzer), smoking status, and current alcohol intake.

Data Analysis

Data consisted of directly recorded participants' responses onto the paper-formatted questionnaires (Appendix 1). The structured interviews for 29 participants were content analyzed by a health psychologist (L.D.). Content analysis is appropriate for analyzing open-ended survey questions and involves the interpretation of the context of data through a systematic classification process of coding and identifying themes of patterns (Hsieh & Shannon, 2005). A conventional content analysis was followed: (a) data were read and re-read to ensure familiarization, (b) phrases were highlighted that captured key thoughts and concepts, and (c) notes of the first analytical thoughts were documented. Labels for codes emerged and were arranged into a coding scheme and further arranged into categories, while recognizing how codes were related and linked. Categories and names for categories were derived from the data inductively (Hsieh & Shannon, 2005). The findings were discussed with other researchers (C.H., A.G.) and any discrepancies were resolved. The findings reported below reflect the responses obtained from the open-ended structured questions.

Results

Characteristics of participants completing the postintervention interview are reported in Supplementary Table 1.

Content analysis revealed positive experiences and outcomes of taking part in the intervention (Table 1;

Supplementary Table 2 for additional quotations). Experiences provided useful insights into recommendations for future research design and motivations and barriers to continuing engagement after the study completion. In total, seven categories (each featuring three to five subcategories) were obtained (Table 1).

Self-Perceived Improved Health and Physical Fitness

Participants described experiencing self-perceived improved health and physical fitness; this included confidence in performing everyday tasks, feeling fitter and stronger, and improved general health and mentality.

I can now walk up and down stairs without holding a bannister. I have more confidence going out walking and using stairs. (ID 40, age 77)

Better physically, I felt doing things at home was easier; such as housework. (ID 59, age 77)

I started to feel fitter, realised I was fitter . . . more strength and stamina. (ID 45, age 69)

Associated with the physical side is feeling good mentally. (ID 49, age 79)

Some of the participants acknowledged the gym environment and engagement in exercise as a "daunting" experience. Associated with self-perceived improved health and physical fitness was the feeling of encouragement to increase their current activity levels, and experiencing an increase in their self-confidence through having engaged in the intervention.

Getting into the gym over a period of time has given people confidence to progress and keep it up. I will continue a couple of days a week; overall it's daunting going into a gym due to unfamiliarity of equipment and not knowing modern equipment. This study has helped familiarise me with resistance machines, old gyms were mostly free weights, and this has given me confidence to use the machines. (ID 85, age 68)

When describing their overall experience of taking part in the intervention, some of the participants noted old age as a barrier to engage in exercise (i.e., age-related connotations), and because of participating in the study, they experienced a changed mind-set, realizing that they could do more regardless of their age.

I've realised I can do more on the machine, it's motivated and encouraged me to do more . . . it lets you know what you can do if you try. I'm amazed at how strong I am when pushing the bars. It's made me think and opened my eyes. Just because you're older, doesn't mean you can't do it. (ID 91, age 80)

Table 1. A Content Analysis of the Responses Obtained From the MilkMAN Participants.

Categories and subthemes	Example quotes
Self-perceived improved health and physical fitness	“Better physically, I felt doing things at home easier; such as housework.” (ID 45, age 69)
Confidence in performing everyday tasks	“A bit of an eye opener as to overall health fitness to people over 60. People underestimate themselves.” (ID 85, age 68)
Feeling fitter and stronger	
Improved general health and mentality	
Encouragement to increase activity levels	
Age-related connotations	
Education	“I gained knowledge in how to do exercise.” (ID 66, age 72).
Knowledge acquisition in nutrition and exercise	
Information tailored on performing RE	
Encouragement to opt to consume whole milk	
Social wellbeing	
Forming social bonds	“Made some nice new friends we are going to keep it up . . . supporting and encouraging each other to continue.” (ID 101, age 68)
Working closely with peers and encouraging and motivating one another	“I felt comfortable with exercise because of the research team supervision.” (ID 70, age 71)
Social bonds, motivations of continued engagement, mainly widowed women	
Personal attention and support	
Positive reported outcomes	
Increased energy	“My knee arthritis pain is not as bad as it was.” (ID 99, age 67)
Reduced pain	“I’m opting for better, healthier foods.” (ID 45, age 69)
Better lifestyle choices	
Attitudes and barriers to fluid consumption	
Postexercise drink consumption was a reward and refreshing	“Surprised as how easy I found drinking the [whole] milk, it got to where I was grasping to drink the milk after exercising. I enjoyed it . . .” (ID 40, age 77)
Whole milk is acceptable	
Barriers to maintenance postintervention	“I’ve never been to the gym, I wouldn’t go on my own its too boring and I wouldn’t feel comfortable . . .” (ID 69, age 71)
Affordability (cost of a gym membership)	
Environmental factors	
Dislike of the gym environment	
Preference for alternative exercise	
Concern over self-injury and negative health outcomes (weight gain and cholesterol)	
Encouraging other older adults	
Provide an opportunity for peer support	“For general population, you need to advertise, use GPs to help engagement/ Helix Art (group 65+).” (ID 66, age 72)
Marketing and communication strategies (i.e., leaflets)	“Use the results and make a leaflet to encourage them [older adults].” (ID40, age 77)
General practitioners (GP) were viewed as a credible source	

Note. RE = resistance exercise; MilkMAN = Milk Intervention Muscle AgeiNg.

When you get past 70 it's nice to see you can do something to improve your physical and mental well-being. (ID 40, age 77)

A bit of an eye opener as to overall health and fitness to people over 60. People underestimate themselves. (ID 85, age 68)

Education

Participants described being educated with knowledge acquisition in nutrition and exercise. This was experienced during discussions with the research team (L.D., C.H., A.G.).

It made me realise what the problems are in old age; muscle waste, something you never think of . . . the health benefits of milk and exercise; important in muscles for later life; strength and links to falls and accidents. (ID 99, age 67)

I gained knowledge in how to do the exercise. (ID 66, age 72)

Opinions about milk as a functional food for muscle strength and function were positive; some older adults reported changing to consuming whole milk instead of semi-skimmed/ skimmed due to being educated about the benefits of nutrients in milk for healthy aging.

A lot to talk about (milk) encouraged me to buy more and I'm no longer drinking semi-skimmed. (ID 83, age 66)

Social Well-Being

Forming social bonds with peers emerged as an important experience of taking part in the intervention. Social interactions in a fun environment were motivators of engagement, especially through supporting and encouraging each other during exercise. Developing and maintaining social bonds were motivating influences for continued engagement after the study completion mainly for widowed women.

I developed a friendship that will last and continue, I had fun with my training partner . . . as a team you matched me very well—I thought you matched people by personality. (ID 66, age 72)

Social aspect was great, the best thing I've ever done. I was meeting new people all in the same boat . . . I made a new friend and friends are not easy to make at my age. (ID 40, age 77)

Team effort with training, motivated each other. If I never had my training partner and [exercise physiologist] I wouldn't have achieved what I did. (ID 45, age 69)

Made some nice new friends we are going to keep it up . . . supporting and encouraging each other to continue. (ID 101, age 68)

Participants emphasized the value of receiving support from a "personal instructor" (i.e., exercise physiologist); this provided them with reassurance in their abilities and promoted self-confidence. The responses obtained suggest that receiving personal attention and support from the research team played an important role in participants' continued engagement in the study. They valued supervised training sessions and follow-up evening telephone call after each training day to assess their well-being, muscle soreness, and any difficulties with drinks intake.

Never done resistance exercise before, [exercise physiologist] tailored it to my ability so it was like having a "bespoke" programme, wouldn't have known how to do this on my own. (ID 66, age 72)

I felt comfortable with the exercise because of the supervision. (ID 70, age 71)

It's a very nurturing team, they phone you on a night time, not just sent to do exercises, people are concerned with how you're feeling, social side to it that I didn't anticipate which was unexpected to me . . . very good team, helped with staying in the study, very supported. (ID 66, age 72)

Positive Reported Outcomes

Participants experienced positive health-related outcomes; five participants reported having more energy, and five reported less pain. Nine participants said that they were making better lifestyle choices due to being aware of their own health, and two noted experiencing an increased appetite due to exercising which was viewed positively.

Generated more energy, makes me want to go walk and stops me sitting around . . . benefits include . . . feeling better about yourself. (ID 59, age 77)

My knee arthritis pain is not as bad as it was. (ID 99, age 67)

I found myself being hungry which I didn't experience before. I used to make a meal and not fancy it . . . now I become hungry for any meal and I'm opting for better, healthier food. (ID 45, age 69)

Attitudes and Barriers to Drink Consumption

Participants were asked about the acceptability of consuming milk/control drink and described the drinks as a reward and refreshing post-RE. Two participants expressed negative views due to the taste (skimmed milk and control drink), but only one reported an issue with the required liquid volume. Overall, whole milk was viewed as acceptable (taste and volume).

Surprised at how easy I found drinking the milk, it got to where I was gasping to drink the milk after exercising, I enjoyed it . . . and I looked at it as a reward. (ID 66, age 72)

The taste at first [skimmed milk], I didn't think I could stomach it but I did. I found it great . . . after exercise . . . a nice cool drink and a good substitute for other drinks, I don't drink juice or anything so used to worry about my fluid intake. (ID 40, age 77)

Barriers to Continuing Engagement After the Study Completion

Barriers to continuing engagement after completion of the study included affordability (cost of gym membership), environmental factors including being more unlikely to exercise indoors during the summer months, a dislike of the gym environment/RE, and a preference for alternative exercise (gym classes or walking). One participant raised a concern over self-injury in the gym without practical support (a personal instructor or trainer) while working on the equipment, and one female was concerned with negative health outcomes (cholesterol and weight gain). Two participants stated that knowing the results of the intervention would help them decide whether to continue consuming milk in combination with RE or not, and one regular consumer of whole milk reported not wanting to increase her milk consumption so continuing only with RE.

Issues with [gym] cost for people, need to offer on the national health [service] to get a lot more people to go [to the gym]. (ID 88, age 71)

Winter months would have been better when there isn't much to do and you're not getting much exercise. (ID 73, age 69)

I'm not going to drink whole milk, it's fattening and might elevate my cholesterol . . . I wouldn't like to be in the gym on my own, I would probably hurt myself. (ID 57, age 73)

I've never been to the gym, I wouldn't go on my own its too boring and I wouldn't feel comfortable in that environment. (ID 69, age 71)

Encouraging Other Older Adults

Participants suggested that a possible motivating factor to encourage ongoing engagement with the intervention would be providing the opportunity for peer support. Communication and marketing strategies were also suggested, including advertisements aimed at the general population and older age groups. General practitioners (GPs) were viewed as a credible source to motivate older adults to exercise and eat healthily. However, more than half of the participants could not suggest ways to encourage other older adults to engage in nutrition and exercise-related interventions.

People need somebody to go with [to the gym] to encourage them. If two people go together it will help some people. Once there, they can talk to people about it, lots of people are in the same boat (widowed). (ID 91, age 80)

For general population you need to advertise, use GPs to help engagement/ Helix Arts (group 65+). (ID 66, age 72)

All surgeries should recommend this course to everyone, older adults. Use the results and make a leaflet to encourage them. (ID 40, age 77)

Discussion

Current recommendations for the treatment and prevention of sarcopenia include adequate protein intake and RE (Cruz-Jentoft et al., 2014; Deutz et al., 2014; Oliveira et al., 2018); however, encouraging older adults to change their dietary habits and engage in RE is challenging (Burton et al., 2017; Chao et al., 2000; Cohen-Mansfield et al., 2003; Crombie et al., 2004; Moran et al., 2014).

Summary of the Findings

In the MILKMAN pilot study, older adults were asked to share their experiences of taking part in a nutrition and RE intervention for sarcopenia to understand what motivates their behavior and the barriers to continuing engagement after the study completion. Content analysis revealed several categories for engagement in the intervention, including self-perceived improved health and physical fitness, education, social well-being, professional support in a fun environment (gym), positive reported outcomes, and motivators and barriers to maintenance after the study finished.

Participants felt that their health and physical fitness had improved as a result of taking part in the intervention, including an increase in their confidence in performing everyday tasks, feeling fitter and stronger with positive effects on their general health and mentality. Education was cited as an important aspect of taking part in the intervention. Knowledge acquisition was gained in diet (i.e., nutritional benefits of whole milk for muscle) and exercise (i.e., how to perform the REs correctly), which encouraged behavioral change (e.g., improved diet and continuing with RE after the study completion). Social influences were cited as important for engagement in the study, including having the opportunity to form social bonds and work closely with peers to encourage and motivate one another. Having an exercise physiologist and engaged research team was highly valued by most and may have minimized the risk of attrition. As a result of taking part in the intervention, the participants reported positive outcomes including experiencing an increase in their energy levels, reductions in pain, and making better lifestyle choices (mainly diet and increased exercise). Consuming milk postexercise

was viewed as a reward and refreshing, highlighting milk as an acceptable intervention when combined with RE for healthy muscle aging.

Retaining social bonds were stated as a motivation to continue after the study completion, especially by widowed women. The barriers to maintenance included affordability (the cost of a gym membership), having a dislike of the gym environment and RE and a preference for alternative methods of exercising (i.e., walking and gym classes). Only one female participant expressed concerns over weight gain and high cholesterol associated with continued whole milk consumption after the study completion.

Comparison of the Findings With Existing Literature

It has previously been reported that lacking basic knowledge and misconceptions about health benefits of nutrition and exercise in older adults were barriers to participation in interventions and to behavioral change after completion of the study (Damush et al., 2005; Franco et al., 2015; Moynihan et al., 2007), emphasizing the importance of providing education during delivery of interventions. Several participants in the study identified the gym environment as “daunting.” This may be a barrier in other community-dwelling older adults who have never engaged in an exercise program, or been to a gym. Participants valued the expertise of the exercise physiologist, particularly when shown how to perform the exercises with ongoing continuous support from the research team. Exercise conducted by professionals has been cited as an important motivation elsewhere (Damush et al., 2005; Franco et al., 2015), including in the interventions designed to increase older adults’ confidence so they can overcome barriers to exercise (Conn et al., 2003). Being familiar with exercise tasks promotes motivations to continue in exercise programs (Damush et al., 2005), and older adults are able to maintain exercising having experienced boosted self-confidence through mastering an activity (Franco et al., 2015). However, this becomes difficult in a community setting, because of affordability (Franco et al., 2015); having to pay for exercise professionals (a “personal instructor”) may deter individuals. Interventions could offer drop-in sessions delivered by an exercise expert to introduce older adults to the exercises performed to enhance and promote their self-confidence in RE and ease the daunting experience.

Previous research has also highlighted the importance of social support and valuing social interaction and encouragement (Damush et al., 2005; Franco et al., 2015). Future research and/or exercise programs could be designed that offer supervised sessions with peers to encourage older adults to exercise, as well as offering nutrition advice and support to aid healthier lifestyle

choices. For example, the MilkMAN study provided an opportunity for participants to gather in a room before and after each RE session. Participants consumed their drink in small groups and were supervised by the research team, which facilitated interaction and social bonding. Once older adults feel confident in performing exercises, they could be encouraged to maintain social bonds. Indeed, widowed women stated retaining social bonds as a motivation for continued engagement after the study completion. This finding emphasizes the importance of providing opportunities for social networks, by doing so this may also diminish possible feelings of loneliness (Gardiner et al., 2018). The health benefits of sustained social activities and social ties for overall well-being and successful aging have been well documented (Cornwell & Laumann, 2015). Targeting loneliness may play a part in successful engagement in future health programs. In addition, to help reduce the barriers, participant’s research stories could be used to promote engagement in interventions.

The majority of participants described GPs as a credible source to encourage older adults to engage in exercise and nutrition health behaviors. This is also reflected in the previous literature; regular contact with family doctors and receiving medical advice were emphasized as important to overcome barriers to consume protein-enriched food (van der Zanden et al., 2014). The participants suggested communication strategies by providing leaflets in GP practices. However, high quality of social support (family, friends, neighborhood) and social participation have been recognized as mediators in promoting healthy behaviors, such as regular exercise and healthy diet (Emmering et al., 2018).

Challenges still exist in continuing these interventions after completion of the study exercise as not all participants reported being motivated to continue. Of those older adults interested in continuing, follow-up telephone calls would have been useful to provide insights into what continues to motivates them, or whether they experienced any barriers that precluded maintenance after completing the study. Interestingly, more than half of the older adults could not suggest ways to encourage other older adults to engage in nutrition and exercise-related health interventions/programs, highlighting the challenges faced. Efficient, less costly methods of exercise in the community may be needed with methods to encourage older adults to exercise and increase their protein intake. Previous research has highlighted weekly telephone or mail-delivered cues as an effective strategy for encouraging exercise and physical activity among older women (Conn et al., 2003). Older adults may welcome telephone support as a method of influencing and motivating their behaviors. However, further research is warranted to understand how health and exercise professionals can ensure that healthy behavior becomes habitual.

Strength and Limitations

The strengths of the study include high retention and engagement in postintervention interviews and willingness to share views. Several limitations of the study should be noted. Data were collected using standardized open-ended questions within a structured postintervention interview and were therefore not in-depth. However, all those who completed the intervention were given the opportunity to share their views. An in-depth understanding of why some older adults, particularly men, do not continue to exercise is still needed to suggest ways to overcome barriers for effective community-based health programs. Participants were interviewed by members of the research team and social desirability bias may have occurred. To minimize bias, participants were advised that all responses gathered would help inform the development of future research, and all suggestions would be welcomed to facilitate this process. Although some participants did report experiencing some difficulties with day-to-day activities prior to participation, the findings relate to a relatively healthy older adult population who willingly participated in a health intervention. Therefore, the findings may not generalize to older adults with functional impairments and physical difficulties with day-to-day activities.

Implications

Several potential practical implications to improve the quality of future nutrition and exercise interventions in older adults were identified. To improve engagement, studies could include an educational component about the specific health benefits of nutrition and exercise, including correcting misconceptions about older adults' abilities to take part in exercise programs. Future studies could also create opportunities for peer support and social bonding between participants encouraged by an engaged research team. Providing professional support in a fun and friendly environment may increase confidence and self-efficacy of older participants who have doubts about their physical abilities. For continued engagement after completion of the study, retention of social bonds and social interactions, affordable gym membership, and involvement of GPs as a credible source to motivate positive exercise and diet behaviors should be considered.

Conclusion

This embedded qualitative study revealed that self-perceived improved health, education about benefits of nutrition and exercise, social well-being, professional support in a fun environment, and positive reported outcomes were motivators to older adults engaging in a nutrition and exercise intervention for sarcopenia in the community. For continued engagement after completion of the study, opportunities for peer encouragement, social

bonds and their retention, and affordability of exercising in a gym setting should be provided to older adults to promote and maintain positive health behaviors.

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Ethical Approval

The study was conducted according to the World Medical Association Declaration of Helsinki and approved by The North East–Newcastle and North Tyneside Research Ethic Committee 1 (18/NE/0265).



Declaration of Conflicting Interests

The authors declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: This study received “in-kind” contribution from Arla[®], which had no other role with respect to research design, authorship, and/or publication.

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Supplemental Material

Supplemental material for this article is available online.

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