1 **Beliefs about inevitable decline among home-living older adults at risk of malnutrition:**

2 **a qualitative study.**

3

4 **Abstract**

5 **Background**

6 About 14% of free-living adults aged 65 and over are at risk of malnutrition. Malnutrition

7 screen and treat interventions in primary care are few, show mixed results and advice given is

8 not always accepted and followed. We need to better understand the experiences and contexts

9 of older adults in order to develop interventions that are engaging, optimally persuasive and

10 relevant.

11 **Methodology**

12 Using the Person-based Approach, we carried out 23 semi-structured interviews with

13 purposively selected adults aged 65 and over with chronic health or social conditions

14 associated with malnutrition risk. Thematic analysis informed the development of key

15 principles to guide planned intervention development.

16 **Results**

17 We found that individuals' beliefs about inevitable decline in appetite and eating in older age

18 compounds the many and varied physical and physiological barriers they experience. Also,

19 we found that expectations of decline in appetite and physical ability may encourage

20 resignation, reduce self-efficacy to overcome barriers and reduce motivation to address

21 weight loss and/or recognise it as an issue that needs to be addressed. Fear of loss of

22 independence may also reduce the likelihood of asking GPs for advice.

23 **Principal conclusions**

24 Key findings identified include a sense of resignation, multiple different barriers to eating,

25 and a need for independence, each underpinned by expectation of decline in older adulthood.

26 Interventions need to address misperceptions about the inevitability of decline, highlight how

27 and why diet recommendations are somewhat different to recommendations for the general

28 population, and suggest easy ways to increase food intake that address common barriers.

29

30 **Key words**: Person-based Approach, Malnutrition, Older adults, Eating patterns, Intervention

31 development, Qualitative research

32

33 **Introduction**

34 Malnutrition in older adulthood is a global issue, though contextual differences between

35 countries will impact on how malnutrition can best be addressed in each country. In the UK,

36 1.3 million (11%) of adults over 65 are believed to be malnourished, rising to 18% of those

37 receiving home or day care[1-3]. Global Leadership Initiative on Malnutrition (GLIM)

38 diagnostic criteria for malnutrition include: non-volitional weight-loss, low body mass or

39 muscle strength; plus reduced food intake or assimilation, disease burden or inflammation[4].

40 Malnutrition risk, measured by e.g. MUST[5] or MNA[6], is associated with frailty, sarcopenia,

41 falls[7-9], GP consultations, hospitalisation[10] and reduced quality of life[11]. Malnutrition among

42 older adults in the UK was associated with excess costs of £10 billion in 2011-12, mostly for

43 institutional care or hospitalisation, so early identification of risk, and treatment for free-

44 living adults might produce significant savings[3]. Screening and treating malnutrition risk in

45 primary care may also improve patients' health and quality of life[12 13], but it is unclear how

46 best to do this, or how to engage older adults who may not consider themselves to be 'at risk'.

47 Additionally, consensus is lacking about which malnutrition risk factors can be usefully

48 targeted. More than 120 potential causes of malnutrition have been identified, which

49 individually may be unrelated to malnutrition risk[14], but which interact to increase risk,

50 though the mechanisms are little understood[15]. Nevertheless, deteriorating health, widowhood

51 and retirement can influence changes in food choices and ways of acquiring and preparing

52 food[16-19]. Changes in such habits can lead to a deterioration in diet quality and quantity

53 accompanied by reduced personal control, exclusion at social events and changed roles and

54 responsibilities[16-19]. A range of physical and psychosocial factors can undermine motivation

55 to improve eating habits[20] by promoting unhelpful beliefs and fears. A mixed-methods review

56 identified that patients had reservations about screening and discussing diet[21]; and difficulty

57 chewing, swallowing, shopping or preparing food are barriers to nutritional self-care[21].

58 Psychosocial barriers included not considering nutrition important, not recognising personal

59 risk, avoiding 'unhealthy' energy-dense food and loneliness[21], being told to gain weight and

60 not believing recommendations will work[22].

61   In previous intervention studies, barriers were addressed through eating pattern advice, such

62   as recommending small portions, energy-rich food, daily snacks; and care pathways, for

63   example dental referral for chewing problems[21], but participants did not always follow the

64   advice given. Psychosocial barriers or beliefs about personal risk were rarely addressed[21], for

65   example patients can be surprised, offended or unconcerned when told they are 'at risk'[23].

66   Previous studies were constrained by small sample size, variable quality and conflicting

67   findings. Few took place in the UK, reducing confidence about applicability to UK settings.

68   Qualitative methods inform intervention design through in-depth exploration of individuals'

69   experiences, habits, needs, values and beliefs[24]. Previous qualitative studies highlight older

70   adults' engagement in nutritional self-care. For example, men with health conditions or recent

71   bereavement were motivated to develop cooking skills or ate simple meals[25 26]. However,

72   those living alone remained 'at risk' despite self-care knowledge, willingness, and ability[27],

73   perhaps through apathy or unmet support needs[28]. Luncheon club participants ate more with

74   friends than strangers or at home, highlighting the importance of social eating[29]. These

75   studies capture possible explanations for a lack of adoption of eating advice to address

76   malnutrition risk, such as apathy toward cooking and eating alone, but they do not explain

77   how this apathy is developed or maintained through specific beliefs around eating in older

78   adulthood. In order to design sufficiently engaging and optimally effective behavioural

79   interventions to address malnutrition risk, we need to better understand the role of such

80   psychosocial factors in the eating behaviour of older adults, how they vary between

81   individuals, and how best to address psychosocial barriers. More qualitative work is therefore

82   needed to explore older adults' beliefs and experiences of eating and low appetite, to help

83   understand how support for overcoming barriers can be provided in a way that is relevant for

84   older adults and addresses their diverse specific needs and circumstances.

85   In summary, free-living older adults need support to address malnutrition risk. Barriers to

86   engagement include: reservations about screening and discussing diet, physical barriers to

87   nutritional self-care and psychosocial barriers including considering nutrition unimportant,

88   not recognising risk, avoiding energy-dense food, loneliness, aversion to being told to gain

89   weight, and not believing recommendations will work. Psychosocial barriers are not

90   commonly addressed in previous intervention studies and there is limited evidence explaining

91   how problematic beliefs about malnutrition risk and eating develop and are maintained.

92   Clarifying these issues will inform engaging and persuasive interventions to supplement

93   evidence-based screening and care pathways.

94　　In the present study, we used the Person-based Approach (PBA) to clarify issues around

95　　eating and appetite in a varied sample of older adults with with a range of health or social

96　　conditions associated with malnutrition risk. The PBA systematically applies qualitative

97　　research, integrating user perspectives when developing behaviour change interventions in

98　　healthcare[24 30], ensuring they are appropriate, engaging, likely to be useful and used. Study

99　　findings will inform the development of an intervention to identify and treat malnutrition or

100　　malnutrition risk, specifically a self-management package that is delivered in primary care

101　　and supported by healthcare professionals. We propose that the intervention is guided by four

102　　principles, from current evidence: a) raise awareness of older adults' nutrition needs; b)

103　　motivate engagement in diet and lifestyle change; c) promote self-efficacy for lifestyle

104　　change; and d) support and promote autonomy, empowering healthy choices. We will refine

105　　the guiding principles, based on the findings of this study.

106　　**Research aim**

107　　We aimed to explore how older adults, with health or social conditions associated with risk of

108　　malnutrition, experience psychosocial factors relevant to appetite and eating behaviour. The

109　　purpose of the study was to inform an intervention comprising a screen and treat policy,

110　　incorporating a self-management package, delivered in primary care.

111　　**Methods**

112　　This qualitative study is part of a larger project using the Person-based Approach, which

113　　involves using qualitative interviews to capture participants' experiences and beliefs[24], and

114　　variation in individuals' personal contexts[31]. This approach is ideal for exploratory work to

115　　inform the development of healthcare interventions. The team that collected and analysed the

116　　data are experienced in applying qualitative methods to inform intervention development. We

117　　carried out face-to-face semi-structured interviews in participants' homes. Interviews took

118　　20-90 minutes, with most taking an hour or more. We obtained approval from NHS (Ref:

119　　207060) ethics committee before data collection. Experienced qualitative researchers, DG,

120　　JSB, LP and PH carried out interviews, after training to ensure ethical and safe good practice.

121　　The study is reported following COREQ criteria[32].

122　　**Participants**

123 Participants were free-living adults aged 65 and over, with one or more of these health or

124 social conditions associated with malnutrition risk. Such individuals might in practice be

125 offered malnutrition screening tests in healthcare settings:

126 • Chronic health conditions e.g. COPD, cerebrovascular disease; cardiac failure;

127 chronic kidney disease (stage IIIb/IV/V); liver disorders; Parkinson's disease; current

128 depression, OR

129 • Hospital stay in the previous 6 months, OR

130 • Living alone.

131 Participants were identified via general practice database searches in Wessex, England, or by

132 snowballing after sharing study details through word-of-mouth. Those interested in

133 participating completed a reply slip after receiving a participant information sheet and

134 consent form. Researchers phoned to confirm candidates were happy to participate and

135 arranged interviews. Consent forms were signed at the start of interviews. A carer or spouse

136 was present in five interviews. Recruitment stopped once a range of views were given and

137 data saturation was reached. Interviews took place between November 2016 and July 2017.

138 Twenty-three participants took part, 16 from a pool of 60 identified via database searches,

139 and seven by word-of-mouth. The general practice sample was purposive, including men and

140 women of different ages. Participants' characteristics are summarised in Table 1. All lived in

141 their own homes, two in warden-assisted flats. The snowball sample consisted only of

142 women. Most participants were aged 75-84, most lived alone, three had recent hospital stays

143 and three were bereaved. Families helped a third of participants with shopping or cooking.

144 Most participants rated their health in the past week as good to excellent but qualified this as

145 'for my age' or 'considering' their health conditions.

146 **Topic guide**

147 The topic guide was based on evidence and evidence gaps, including findings from a mixed

148 methods review[21] and previous qualitative research, as discussed in the introduction. There

149 were seven key questions, each with 'probing' questions that interviewers could use to

150 prompt further detail about topics of interest, if needed. Participants were asked to describe

151 their appetite and eating patterns and related topics, including any concerns or needs around

152 shopping, food preparation or eating, and experiences of oral nutritional supplements (ONS)

153 (Supplementary file S1). The topic guide evolved between interviews, ensuring questions

154 were relevant and understood by participants. For example, a question about participants'

155 freezer contents was added to elicit food choices and psychosocial factors, such as how

156 choices reflect nutritional self-care and beliefs about energy-dense food.

Analysis

158 Interviews were transcribed verbatim by a professional transcriber. Inductive thematic

159 analysis was conducted, following Braun and Clarke[33]. Transcripts were coded line-by-line

160 by two researchers independently (LP+PH,LP+LM). All coders discussed which codes best

161 captured participants' experiences. LP compiled researchers' decisions in a coding manual of

162 mutually exclusive codes. Codes were applied to further transcripts (LP, LM and PH), and

163 iteratively adjusted by consensus. Related codes were grouped into themes (Table 2), for

164 example the codes 'Desire to eat', 'Competing priorities' and 'Bereavement' were grouped as

165 'Perceptions about appetite and eating experiences'. Data were collated in a spreadsheet and

166 analysed systematically retrieving excerpts for each code and looking for shared and

167 disparate experiences within codes (LP).

168 The analysis was scrutinised and elaborated (LP and LM). This included 1) considering the

169 range of experiences of appetite and eating in their everyday lives that participants described;

170 2) describing how barriers and facilitators around eating were experienced; 3) identifying

171 support needs; and 4) examining values and beliefs expressed about eating activities. We then

172 considered what would be the key implications of the findings for intervention design.

Results

Themes

175 Seven themes were identified (Table 2). There was striking variation in participants'

176 experiences, but also common challenges and beliefs. Participants talked extensively about

177 psychosocial aspects of their eating experiences and behaviours, in relation to their physical

178 challenges, perceptions, beliefs, social context, self-regulation, psychological responses to

179 unintended weight loss and perceptions about nutritional supplements. The results presented

180 focus primarily on these psychosocial aspects, supporting our aim to identify and make sense

181 of barriers, facilitators, values and beliefs around eating in older adulthood.

1. Physical and physiological aspects

183 Many participants offered physical or physiological explanations for not eating as much as

184 they used to, including illness, immobility, pain, medication, reduced activity, or difficulty

185 chewing, swallowing or digesting certain foods. They described how any of these physical

186 difficulties could present physical and psychological challenges to shopping or preparing

187 food or making what they considered to be 'good' food choices. For example, pain was

188 described as making it difficult to stand in the kitchen to prepare food as well as reducing

189 motivation to eat. Some participants described their appetite as 'good', 'normally good',

190 'fine', 'healthy' or 'ok', while many described it as 'not that good' or reported noticing their

191 appetite deteriorate. Loss of appetite and losing enjoyment for eating were attributed to

192 changing taste perceptions, nausea, medication, feeling full or anticipating indigestion.

193 *A lot of things that were normal for me now I find too sweet, cakes and chocolates and*

194 *biscuits and things like that…Taste does seem to have changed since I had pneumonia…But*

195 *that could be drugs that they put into me…*(P223,male,86)

196 **2. Perceptions about appetite and eating experiences**

197 Some participants described their perceptions about challenges they experienced around

198 appetite and eating. Most described reduced desire for food making them less inclined to eat

199 substantial meals, but for some, 'desire' for certain foods was distinguished from 'feeling

200 hungry', which was perceived as a need for food. Some participants perceived appetite or

201 weight loss positively for health reasons or because they valued thinness, while others

202 reported efforts to regain weight following challenging experiences, such as illness or

203 hospitalisation, and some of these were successful. Preparing food, cooking and eating were

204 described as a chore by several participants, who stated they sometimes or often could not be

205 bothered to cook or eat. Although others did not specify that they 'could not be bothered',

206 they reported prioritising other activities above eating, missing meals to look after

207 grandchildren or continuing with activities such as gardening, and stated that hunger soon

208 passed. A few participants described losing a spouse as the point at which they struggled to

209 eat, and reported not being bothered to cook, not fancying food, or feeling too lonely to eat.

210 *We just keep going, by the time I get to two o'clock, the idea of food has worn off, and I won't*

211 *think of it, although by the time we, if we come back here, by four o'clock or half past four,*

212 *then seeing the little nibbles I start to pick, then it might reawaken the appetite, but I can*

213 *easily slide through it…*(P53,female,65)

214 *And since I lost him I suppose it [my appetite] just went down. I can't, I think to myself, oh I*

215 *can't be bothered, not for one.*(P111,female,79)

3. Beliefs around eating

Participants frequently expressed an understanding that eating is important in order to stay fit and healthy. However, participants described often skipping meals, eating two or fewer meals a day or eating small amounts, which was then perceived as confirmation of the belief that they needed less food. Many stated that appetite and quantity of food consumed is expected to decline with age, and this perceived inevitable decline was attributed to reduced activity and mobility after retirement.

I will usually always have breakfast, but sometimes at lunch I don't feel hungry, then in the evening I don't feel hungry and a couple of times I've sort of just had cereal before I've gone to bed because I think I'm going to wake up hungry.(P393,female,83)

Several participants favoured balanced diets, but some emphasised their adherence to 'healthy' diets by describing fruit, vegetables, skimmed milk and cereals they ate, or stating that they avoided ready meals. A few adhered to restrictive diets, believing them to be healthy and protective against weight gain and some avoided dairy products, for health reasons. Two participants expressed awareness of eating high-energy foods to regain weight or prevent excessive weight loss, though another disagreed with their GP's recommendation to eat high-energy foods. Some participants were reluctant to admit to making food preparation or eating easier by having ready meals or snacking, if they believed these strategies were unhealthy. Where these strategies were used, participants emphasized their selection of 'healthy' versions.

It seems terrible to say this but it's easier not to eat than it is to prepare, that's why it's easy to snack. When you get a bit older um its.....I'll just have this (Yeah) I'll have some toast, I won't have a meal or we'll have a ready meal.(P33,male,75)

4. Support needs

Participants living alone or with challenges around shopping, preparing food and eating often had tangible support from family or support organisations and were grateful for this. However, some expressed regret that relying on others sometimes meant getting help at the wrong time, or that their preferences were not always considered. Social eating occasions with friends or family at home, in pubs or restaurants were experienced in various ways. Some participants reported eating more or richer food than usual with others, including with strangers in a café. However, those with little appetite or difficulty eating certain foods

247   described social eating as uncomfortable, either physically or if they felt embarrassed or

248   pressured to eat certain foods. A few participants reported forcing themselves to eat what

249   they felt they should and sometimes giving in to coercion from family members. Resentment

250   or sadness then seemed evident, and participants expressed more contentment when families

251   encouraged choice.

252   *P: She said,'Now you eat, Mum, what you wants. Don't force anything down you, just eat*

253   *what you wants', and that's what I've been doing.*

254   *I: Yeah. And how is that going?*

255   *P: Alright, yeah. Yeah, it's going alright.*(P111,female,79)

256   Some participants expressed a desire for help to change their habits, if unsure how much to

257   eat or how to gain weight. A few had received advice from doctors but didn't always follow it

258   if they found it difficult or didn't understand or accept the rationale for recommendations.

259   One participant stated that the personable approach of a new doctor made them confident to

260   ask for advice, but others were deterred from seeking help based on prior, unsuccessful

261   experiences.

262   *I: And how did you feel about that advice, to put cream in instead of milk?*

263   *P: Well I wouldn't say I agreed with her really…..because I think all you're going to do is put*

264   *a big tummy and not going to build the muscle back up at all…*(P393,female,83)

265   **5. Regulation and self-regulation**

266   Participants described varied eating self-regulation, with some following set patterns most

267   mornings, lunchtimes and evenings, while others reported eating when hungry or often

268   skipping meals. Some outlined experiences from childhood or habits developed when

269   working that they believed had influenced their current eating patterns, including two who

270   described experiencing anorexia when younger. Some participants reported keeping the

271   eating patterns that they had at work, which could mean continuing to have a large meal at

272   lunchtime or in the evening, or prioritising other activities and grabbing a bite when they had

273   an opportunity. Others described enjoying changing to eating more casually or more regularly

274   after retirement, unrestrained by work routines. Participants with less regular eating patterns

275   generally described their spouses' influence as beneficial, for example if the spouse cooked

276   or preferred to eat regularly. However, there were examples of potentially negative

277 influences, such as participants following their spouse's prescribed diet for convenience,

278 although their health problems differed.

279 *Well I mean we've sort of got ourselves in a discipline of not eating between meals, umm and*

280 *so we don't eat between meals. If we feel hungry, we wait until the next meal.(P143,male,74)*

281 Participants outlined strategies for eating without desire, including eating at set times,

282 creating a conducive atmosphere, or grazing throughout the day on 'easy' food including

283 soup, rice pudding or treats. External cues were described as having positive or negative

284 effects: seeing, smelling or tasting food could increase desire, remind one to eat, or be off-

285 putting. Some participants favoured planning, including pre-ordering meat, planning the

286 week's meals, stocking easy-to-cook food and freezing food portions, while others stated that

287 they didn't plan because, living alone, they could suit themselves. A few participants talked

288 about low mood affecting whether they would carry out plans. Both planners and non-

289 planners sometimes missed meals, but some non-planners described difficulty deciding what

290 to eat if appealing options were unavailable.

291 *I'll just suddenly find, well I wouldn't mind such and such a thing, and then I'll go round the*

292 *cupboard and just see if something appeals to me....and I don't really, you know I don't*

293 *really fancy something, or I haven't planned for anything.(P333,female,88)*

6. Psychological responses to unintended weight loss

295 Participants often expressed negative feelings about appetite or weight loss or loss of

296 enjoyment around eating, and many considered these changes to be inevitable as they got

297 older. Some expressed a desire to change their eating habits, however difficult it was to eat

298 more, more frequently or regularly, but others accepted decreasing desire to eat and described

299 avoiding social activities that involved eating. A few participants stated they tried to eat well

300 but had not gained weight and didn't know what else to try, and this was tinged with sadness

301 and resignation. A few also expressed dissatisfaction and resignation about other aspects of

302 their lives, such as loneliness, living somewhere they disliked, or mood fluctuations, which

303 they suggested could influence the desire to eat. One participant made a link between eating

304 well and positive mood.

305 *There are ups and downs, and if it's one of your down moments, then you do something, like*

306 *stop eating, when really and truly you should be eating more to get you up out of that down*

307 *beat.(P593,female,92)*

308 **7. Perceptions of oral nutritional supplements**

309 A few participants had experienced Oral Nutritional Supplements (ONS), prescribed for

310 themselves or their spouse, or had tried over-the-counter supplements. Some participants

311 liked some ONS flavours, or mentioned strategies to make ONS more palatable, but overall

312 ONS were disliked and avoided, due to their texture, a sensation of being too full or difficulty

313 in digesting the milk used to mix them, which was perceived as appetite-reducing.

314 Participants also alluded to ONS reminding them of their spouse's terminal decline.

315 *I don't know what you can do to get your appetite back unless you're saying we try and make*

316 *myself drink a protein drink each day - we did have that - I still got some in the*

317 *cupboard.*(P001,female,83)

318 **Discussion**

319 Participants offered multiple reasons, and shared their perceptions and beliefs, when

320 explaining why they did not eat as much as they used to, and many described reduced

321 enjoyment or desire around eating. They outlined how shopping, cooking and eating habits

322 changed in the face of physical challenges, for example relying on others for shopping,

323 making simple food, or eating less when experiencing pain. Participants believed that certain

324 foods were needed for health and fitness, but most expected appetite to decline with age.

325 Support needs were generally met in this sample, though quality of support, particularly

326 encouragement and personal choice, was most valued. Participants' eating patterns were

327 varied, with some keeping regular mealtimes, while others ate when they felt like it.

328 Participants expressed sadness about unintended weight loss and reduced enjoyment of

329 eating.

330 **Sense of resignation**

331 Our findings confirm that older adults have little awareness of malnutrition risk factors and

332 tend to attribute reduced appetite and food intake to normal ageing rather than risk-taking

333 behaviour. Extending Reimer, et al[23], we found that some people deny their risk, while others

334 are acutely aware that weight loss can have serious health consequences. Recently bereaved

335 participants expressed fear about their reduced appetite and weight loss after caring for

336 someone who became frail and died, perhaps worrying that they are also in decline[34].

337 Behaviour change interventions need to increase understanding of risk, but strategies to

338 address risk and provide reassurance that one can stay well are also needed.

339 We found a widely expressed belief that reduced appetite and food intake are normal in
340 ageing, as noted previously[35]. This is important because ageing-related stereotype beliefs may
341 reduce individuals' confidence to carry out health-promoting behaviours[36]. Novel to our
342 study, participants with long-term eating difficulties, pain, inactivity or reliant on others for
343 everyday needs expressed resignation to reduced appetite and eating alongside physical
344 decline and deteriorating quality of life. Resignation was frequently expressed as no longer
345 being 'bothered' to cook or eat as effortfully as they had. Those with recent weight loss, such
346 as during bereavement or hospitalisation, seemed motivated through fear or hope to find
347 solutions, but also seemed to have a sense of resignation while experiencing the pain of loss.
348 There appeared to be a trajectory towards resignation which started with age-related beliefs,
349 reinforced by experiencing decline and reduced choices. Interventions need to address beliefs
350 about inevitable decline, highlight how eating can prevent decline and encourage self-
351 efficacy.

352 **Diverse experiences, significant common barriers**

353 Our findings revealed that many lacked the confidence to change their eating habits, and
354 overcome barriers, as identified in previous studies[37 38]. Misperceptions about ready meals,
355 frozen vegetables and snacks being 'unhealthy' were common, perhaps reflecting long-held
356 beliefs or guilt about choosing easy options over home cooking[39]. Interventions need to
357 address misperceptions, normalise easy cooking options, share participants' successful
358 strategies and provide food suggestions, to support users' confidence.

359 Difficulty with self-regulation (i.e. eating few meals, skipping meals, eating only when
360 hungry) was also common, particularly, though not only for those who lived alone. This is
361 congruent with research suggesting that sensations of hunger and feeling full are related to
362 self-regulation[40]. Demonstrating beneficial habits and using visual cues and reminders to
363 trigger hunger and eating, can support self-regulation of eating[41 42], and could be included in
364 interventions.

365 Novel to this study, these significant common barriers were experienced despite striking
366 variation in participants' eating experiences and behaviours. Uncertainty about how much or
367 what to eat to stay well or prevent further weight loss seemed to hinder beneficial food
368 choices. Extending previous research[43], reduced taste perceptions, expecting a reduced
369 appetite, distracting activities, negative emotions and loneliness seemed to override the
370 body's need for food and the subsequent sensation of hunger. Lack of hunger was commonly

371 seen as a sign that food was not needed. Novel in research with older adults, some

372 participants distinguished between hunger and desire for food items and were more likely to

373 eat due to desire than hunger. Interventions could therefore encourage eating desired foods.

374 Some available ONS flavours were liked, contradicting previous research[44], though dislike of

375 ONS textures and the finding that ONS would be avoided except as a last resort concurred

376 with previous research[45]. A new finding was that participants may be averse to ONS if they

377 associate ONS use with distress about a spouse's terminal illness. Interventions need to

378 address how to package the message that ONS can help prevent unplanned weight loss and

379 encourage speedier recovery from infections. Interventions can also offer suggestions to

380 make ONS more appealing and easier to drink, including suggestions given by participants.

381 In future, enriched food products may provide a more acceptable alternative to ONS[45],

382 though the way they are presented to users will also be important.

383 **Difficulties maintaining independence**

384 In the present study, many participants ate less than they used to, concurring with previous

385 research[27 46-49]. Some participants seemed to have an almost obsessive adherence to eating

386 behaviours they felt would keep them healthy and independent, for example emphasising the

387 amount of fruit, skimmed milk and breakfast cereals they ate, or how little they ate. This

388 concurs with Winter, et al.[35] who found food choices were influenced by a desire for

389 independence, but that strict diets could compromise nutrition, undermining independence.

390 We also concur with Maitre, et al[50] who found that malnutrition risk is associated with food

391 'pickiness', both of which increase alongside growing dependence on others for food-related

392 activities. It is important to convey older adults' dietary needs in interventions, while

393 emphasising how meeting these needs can support independence. Participants also reported

394 sometimes eating more or richer food than usual when eating with friends and family,

395 concurring with Burke, et al.[29], whose luncheon club attendees ate more among familiar

396 people. Interventions would do well to offer strategies for lone eating and encourage social

397 eating.

398 Extending previous research, accumulating impacts from health conditions and life events,

399 underpinned by age-related beliefs, made shopping, cooking and eating harder, making it

400 difficult to maintain independence. Participants remained independent if sharing eating-

401 related tasks with a partner but, once alone, some struggled to sustain the range of behaviours

402 required for self-care. Declining independence impacted further on their ability to shop, cook

403 and eat, contradicting research which found that men living alone with chronic health

404 conditions or who were bereaved adapted to providing for themselves[25 26].

Key implications for intervention design

406 Prior to this study we proposed that intervention development would be guided by four

407 principles, from current evidence: a) raise awareness of older adults' nutrition needs; b)

408 motivate engagement in diet/lifestyle change; c) promote self-efficacy for lifestyle change;

409 and d) support and promote autonomy, empowering healthy choices. The current study

410 findings allow refinement of these principles. We clarified that appropriate intervention

411 targets are: 1) improving risk awareness, 2) promoting self-efficacy to manage malnutrition

412 risk, 3) promoting self-efficacy to overcome barriers to eating and making long-term changes,

413 particularly resignation to age-related decline, and 4) promoting support from healthcare

414 professionals that offers choice and encouragement and harnesses personal reasons for

415 lifestyle change. Self-efficacy and motivation for lifestyle change are thus combined, being

416 closely linked and underpinned by resignation to age-related decline. Participants' unmet

417 need and desire for support to tackle eating difficulties encourages us to address this need

418 despite previous research suggesting older adults are unlikely to make changes[51].

Strengths and limitations

420 Strengths of the present study include findings from a range of free-living older adults with

421 different malnutrition risk factors, adding to previous research about psychosocial aspects of

422 eating among this population. In particular, this includes an expectation of decline that

423 contributes to a sense of resignation to multiple different barriers to eating, and difficulty

424 maintaining independence. The resulting understanding of participants' experiences will

425 inform the development of interventions to encourage eating that meets the needs of such

426 older adults.

427 Included individuals were currently struggling to shop, prepare food and/or eat, or anticipated

428 such challenges in the near future. Some appeared undernourished, though we used no

429 objective measure of malnutrition risk. We also included individuals who were currently

430 eating regularly, some of whom had experience of unintended weight loss from which they

431 had recovered, giving useful insights. This study could be improved by including more men,

432 or those with a wider range of conditions known to increase malnutrition risk.

Conclusions

434   The key findings are that: 1) sense of resignation; 2) diverse experiences and common

435   significant barriers; and 3) difficulties in maintaining independence underpin the experience

436   of eating and appetite among older adults at risk of malnutrition. There seems to be a

437   trajectory of increasing resignation in the face of common beliefs, values and barriers to

438   eating among older adults with health and/or social conditions known to increase malnutrition

439   risk. Diverse multiple barriers to eating were found, which may be underpinned by common

440   beliefs and misperceptions. Beliefs, values and barriers can also conspire to undermine older

441   adults' aim to remain independent.

442   Interventions need to counteract commonly held beliefs and misperceptions about the process

443   of inevitable decline in appetite and eating needs during ageing in older adulthood, outline

444   facilitators that have worked for others, and persuade participants that some currently

445   unpopular behaviours e.g. ONS, can support wellbeing and independence.

446   **Unanswered questions and future research**

447   Future intervention development studies would do well to incorporate the findings of the

448   present study and implement and test ways of addressing the key barriers identified. The

449   study team has carried out such a study and aims to publish the results shortly. The mooted

450   mechanisms identified in the present study e.g. raising risk awareness, promoting self-

451   efficacy, also need to be tested, and the study team is carrying out a RCT in which these will

452   be investigated. It will be important to assess whether behavioural techniques included in

453   interventions address patients' psychological needs and issues (resignation, independence),

454   and influence behavioural and clinical outcomes. It would also be useful to identify which

455   food-related strategies work best to enable continued independence for older adults.

456   **Supplementary files**

457   S1: Topic guide

458   **Transparency Declaration**

459   *The lead author affirms that this manuscript is an honest, accurate, and transparent account*

460   *of the study being reported. The reporting of this work is compliant with COREQ guidelines.*

461   *The lead author affirms that no important aspects of the study have been omitted and that any*

462   *discrepancies from the study as planned have been explained.*

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