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## **'Feet are second class citizens': exploring the perceptions of Scottish and Portuguese older adults about feet, falls and exercise - a qualitative study**

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1 **Title of the paper**

2 'Feet are second class citizens': Exploring the perceptions of Scottish and Portuguese  
3 older adults about feet, falls and exercise- A qualitative study.

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21

22 **Abstract**

23 **Introduction:** Foot problems are likely to contribute to falls risk in older adults. Foot  
24 and ankle exercises may be beneficial, but uptake may be influenced by cultural  
25 factors. Few studies have explored the views of older adults from different cultural  
26 backgrounds about foot-specific falls risk factors, and foot and ankle falls prevention  
27 exercises.

28 **Objectives:** To explore the views of Scottish and Portuguese community-dwelling older  
29 adults who have experienced a fall, about any foot risk factors for falls, and foot and  
30 ankle.

31 **Methods:** Cross-cultural qualitative study with (n=6) focus groups exploring the  
32 perceptions of Scottish (n=10, mean age 76 yrs) and Portuguese older adults (n=14,  
33 mean age 66 years) aged, applying thematic analysis.

34 **Results:** One main theme 'evolving awareness about feet and falls prevention' and  
35 three subthemes; (i) Feet are often forgotten, (ii) the important role of footwear, (iii)  
36 need to look at my feet and do the exercises were identified. Scottish participants had  
37 more experience of falls prevention but there was a lack of knowledge surrounding  
38 foot-specific falls risk factors, and the role of ankle and foot exercise in the prevention  
39 of falls. Portuguese participants exhibited a fatalistic approach to falls.

40 **Conclusions:** Older adults from both nations had little knowledge of foot-specific falls  
41 risk factors, being initially unaware of the functional status of their feet and of the role  
42 of exercise in foot care and falls management. There were differences between  
43 national groups that should be accounted for when developing culturally adequate  
44 interventions.

45 **Keywords:** feet, falls, foot care, exercise, cross-cultural research

## 46 **Background**

47 Ageing brings changes to foot health and foot function<sup>1</sup>, with a greater prevalence of  
48 foot problems in later life<sup>2</sup>. Hallux valgus, lesser toe deformities, and foot pain become  
49 common foot problems and these may increase falls risk<sup>3</sup>. Foot care seeks to address  
50 symptoms and prevent foot problems, and includes treatments ranging from nail care  
51 to foot and ankle exercises<sup>4</sup>. Furthermore, management of foot complaints and  
52 understanding foot related exercise may reduce the risk of falls in this population  
53 group<sup>5</sup>.

54 Qualitative evidence shows that self-footcare is perceived as challenging for both  
55 healthy<sup>4</sup> and condition-specific groups of community-dwelling older adults<sup>6</sup>.  
56 Knowledge and awareness on general foot health and foot function also appears to  
57 vary greatly in this age group<sup>4,6</sup>. Nonetheless, there appears to be a gap in the  
58 literature concerning specific perceptions surrounding the link between foot problems  
59 and falls risk.

60 Little is known about older people's decision-making process regarding exercise for  
61 falls prevention, particularly from culturally and linguistically diverse backgrounds<sup>7,8</sup>.  
62 Although falls prevention seems to be a low priority for older people in the United  
63 Kingdom, as they rarely perceive falls can be prevented with exercise, there are  
64 differences in beliefs and attitudes between ethnic groups<sup>8,9</sup>. Jang et al. (2016) found  
65 that cultural values and beliefs had a profound and lasting impact on how older adults  
66 perceived and defined ageing and health, their outlooks of cultural appropriateness,

67 family obligations and gender roles and the connotations they attributed to exercise  
68 and fall prevention strategies<sup>10</sup>.

69 Falls prevention interventions need to be culturally suitable, as programme  
70 participation is influenced by cultural and motivational, social and environmental  
71 values<sup>11</sup>. Negative cultural perceptions result in a wide range of implications from  
72 hiding falls episodes, to rejecting walking aids or deeming exercise as not age or  
73 gender appropriate<sup>7,12</sup>. The meaning of exercise also displays a great cultural  
74 variability, having been shown to influence an older people's engagement in exercise-  
75 based falls prevention interventions<sup>7</sup>. Therefore, it's important to consider those  
76 factors to confirm evidence-based recommendations and interventions<sup>11</sup>.

77 To the best of our knowledge, there is a lack of comparative research concerning older  
78 people's perceptions about falls prevention across European countries<sup>13</sup>. It is well  
79 known that the effectiveness of falls prevention interventions depends on the uptake  
80 and adherence rates<sup>14</sup>. Given that these appear to be influenced by the beliefs,  
81 perceptions and preferences of older adults<sup>15-17</sup>, it seems relevant to ascertain any  
82 underlying cultural variation within the European context. Particularly, considering  
83 that variations of ageing perceptions, within social contexts, have been already  
84 identified on the north-south European axis<sup>18</sup>.

85 Furthermore, the available qualitative evidence does not address the views of older  
86 adults surrounding foot related falls risk factors and foot care and the role of falls  
87 prevention strategies such as exercise. The aim of this study is to explore the views of  
88 Portuguese and Scottish community-dwelling older adults, who have experienced at  
89 least one fall in the past year, about these topics.

## 90 **Methods**

### 91 **Study design**

92 This qualitative study using focus group discussions was part of a larger programme of  
93 research exploring older adults' views on a tailored home-based lower limb, ankle and  
94 feet exercise programme<sup>19</sup>. After participants took part in an introductory group  
95 session and a one-week trial of the exercise programme; three focus groups were  
96 conducted in Scotland and three in Portugal. Further information about the home-  
97 based exercise programme, views of participants on undertaking the programme and  
98 the outcome measures proposed are reported elsewhere <sup>19</sup>. Focus groups were used  
99 as this approach offers high ecological validity, and is adequate for groups less  
100 experienced in research participation <sup>20</sup>. All advantageous features when conducting  
101 cross-national research.

### 102 **Participants and Recruitment**

103 Scottish and Portuguese community-dwelling older adults, aged  $\geq 60$  years, who had at  
104 least one fall in the previous 12 months were invited to participate. Participants were  
105 recruited via a variety of convenience sampling methods through local community-  
106 based organisations for older adults [gatekeepers- (e.g. ROAR connections for life-UK,  
107 Envelheseres network -PT), snowballing] and also through a newspaper advertisement  
108 (UK). Recruitment strategies differed between nations due to contextual factors (e.g.  
109 country--specific differences in how gatekeepers manage access to prospective  
110 participants) and available resources.

111

112

### 113 **Eligibility criteria**

114 Participants were required to be able to ambulate and travel independently to venues,  
115 able to read and write in English (Scotland) or in Portuguese (Portugal). Participants  
116 were excluded if they were with diagnosed central nervous system diseases and  
117 cognitive impairment, self-reported depression, significant visual impairment or  
118 registered blindness, recent lower limb fractures (<6 months), recent joint  
119 replacements (< 1 year), or other medical contraindications that would not allow  
120 participants to exercise safely (e.g. Acute medical condition).

### 121 **Data collection**

122 A semi-structured interview guide was used [see Additional file 1 Appendix 2,  
123 Supplementary Data]. Its structure was inspired by interview guides used in previous  
124 research projects<sup>21,22</sup>. Focus group interviews were adaptable to the participants'  
125 contributions, allowing further questioning<sup>23,24</sup>. One researcher (MC), trained in this  
126 approach, led the interviews with support for flipchart note taking by another  
127 researcher (UK) or assistant (Portugal-PT). For data validation, participants were asked  
128 if notes in flipcharts expressed their views accurately. Focus group took place in a  
129 meeting room either at the University (UK) or at the community centre (PT) and lasted  
130 between 45 and 120 minutes. Focus groups discussions were digitally recorded using a  
131 sound recorder (Model MICD-UX560 Sony™).

### 132 **Qualitative data analysis**

133 All focus group audio recordings were transcribed verbatim and anonymised<sup>23,24</sup>. The  
134 anonymised Portuguese transcripts were translated to English, and then proofread by

135 a certified translator. Data was uploaded and managed in NVIVO 11™ software.  
136 Qualitative analysis followed the six phases of thematic analysis framework defined by  
137 Braun & Clarke<sup>23</sup>: 1) Familiarization with the data, 2) Generating codes, 3) Generating  
138 themes, 4) Reviewing potential themes, and 5) Defining and naming themes. This  
139 qualitative analysis approach was selected as it captures people's unique views on the  
140 researched topics and is also suitable to analyse data derived from focus groups<sup>23</sup>.  
141 Flipchart and field notes were considered alongside the transcripts. Three researchers  
142 independently analysed 3 randomly selected transcripts each in order to enhance  
143 validity of the researcher's coding procedures through collaborative discussion. Minor  
144 discrepancies in terms of the procedures were resolved between the team. The  
145 researcher then developed the coding frame for all transcripts, which informed her  
146 search for initial themes. These were reviewed in agreement with the research team.  
147 Illustrative quotes of the theme and subthemes were extracted from the data.

## 148 **Results**

### 149 **Participants**

150 15 Scottish and 24 Portuguese participants agreed to enrol in the study, but focus  
151 group analysis only included 10 and 14 participants respectively, due to a variety of  
152 reasons [see Additional file 1 Appendix 1, Supplementary Data].

153 Ten Scottish adults (mean age 76 years; range 68-80 years, 7 women), and fourteen  
154 Portuguese adults (mean 66 years; range 64-74 years, 12 women) participated in this  
155 study. The three focus groups in Scotland took place, with 3, 3, and 4 participants  
156 respectively. In Portugal, the focus groups occurred in three different small size cities,  
157 with 2, 6 and 6 participants each.



158 Socio-demographic characteristics of the participants are presented (table 1).

159 **Table 1. Characteristics of participants**

Characteristics		Portugal	Scotland
Age	Median (P25; P75)	66 (64; 74)	76 (68; 80)
Sex			
Male	<i>n</i> (%)	2 (14.3)	3 (30.0)
Female	<i>n</i> (%)	12 (85.7)	7 (70.0)
Occupation			
Retired	<i>n</i>	9	10
Worker	<i>n</i>	5	0
Education			
Primary school	<i>n</i>	6	0
Secondary school	<i>n</i>	8	4
College diploma	<i>n</i>	0	4
University degree	<i>n</i>	0	2
Number of falls in last 12 months	Median (P25; P75)	2 (1; 3)	2 (1; 4)

160

161 Qualitative findings were categorized into one main overarching theme and three  
162 subthemes (figure 1). Supporting quotes for each theme are presented as (pseudonym,  
163 Focus Group number and Country (UK/PT)). Further illustrative quotes for each  
164 subtheme can be found in Appendix 3, Supplementary Data [see Additional file 1].

165

**Figure 1. Theme and subthemes**

166 ***Evolving awareness about feet, falls and falls prevention***

167 This theme encompasses the views expressed by focus groups participants regarding  
168 foot health, foot function and falls, both independently and in relation to each other;  
169 as well as to their general health and functional status. Both national groups appear to  
170 lack awareness and previous knowledge about these topics, particularly the  
171 Portuguese participants.

172 There was a lack of awareness surrounding foot health, foot function, foot related falls  
173 risk factors and foot care management. Participants admitted that feet were largely  
174 neglected.

175 *“They pamper their hands, they pamper their faces, they pamper everything else (...)*  
176 *But mostly the Feet... they are second class citizens.” (Anthony, FG3\_UK)*

177 It was evident through discussions with participants that there was limited  
178 understanding between the link between falls risk and foot related issues. This was  
179 highlighted while participants were recalling their individual falls events, they had not  
180 considered that their feet could have been a contributing factor to their fall.

181 *“Well...I tell you what I thought: Nothing! Not at all about my feet. I’ve thought it was*  
182 *something either in my head or my ear...” (Lisa, FG2\_UK)*

183 Poor awareness on these topics was potentially derived from lack of information. Even  
184 the Scottish participants who had been enrolled in falls prevention programmes did  
185 not recall being given information on foot-specific falls risk factors.

186 *“The feet are there and we use them and we don’t think about them. Therefore this has*  
187 *been quite an eye opener.” (Louise, FG1\_UK)*

188 Participants did sometimes elaborate on their reflections about specific foot falls risk  
189 factors.

190 *"I think that if the foot is a healthy foot that has support...and even...I mean...even if*  
191 *one loses balance...But can regain balance better than if...Even if the legs are good, but*  
192 *the foot isn't... One falls more easily. I think!" (Julia, FG3\_PT)*

193 A fatalistic perception of falls was conveyed by quite a few Portuguese participants,  
194 attributing these events to fate or chance. The belief in a protective external force was  
195 also portrayed.

196 *"No! Thank God! I didn't fall this week! Oh my God! Thank God!" (Mariana, FG1\_PT)*

197 Such comments were sometimes accompanied by hands in praying position, or  
198 followed by the cross sign.

199 It was also common for Portuguese participants to depict their falls as unexplainable,  
200 as they appeared to not be aware of any main causes that could be triggering such  
201 events. This seemed to be closely related to lack of information on the topic, which  
202 could be derived from either not recalling or not being given any explanation by health  
203 professionals.

204 *"I fall often, but (...) I don't know...I don't really know how to explain it... I don't need to*  
205 *stumble on anything. Nothing. And when I feel it (...) It's happens whenever." (Vera,*  
206 *FG3, PT)*

207 *"I don't know...No one has ever told me, and I don't have knowledge for those*  
208 *things...But I question myself..." (Sofia, FG3, PT)*

209 ***(i) Feet are often forgotten***

210 Neglecting their feet appeared to be rooted in a combination of aesthetic, social and  
211 functional expectations. Foot care was described as reliant on other people's aesthetic  
212 judgement of body appearance. Since feet are often covered by footwear, and not on  
213 display, they ended up being less prioritized.

214 *"(...) your feet are poor relations in your body, you know? no one sees your feet".*

215 *Anthony (FG3, UK)*

216 However, those who perceived their feet as key elements to perform valued activities  
217 of daily living (e.g. sports) acknowledged their importance. Interestingly, these  
218 participants would portray themselves to be an exception to the norm.

219 *"I've always been aware of foot health because I look on it 'If you're not on your feet,*  
220 *you're in your bed!'" (Lisa, FG2\_UK).*

221 Across both nations, participants generally seemed unaware of how relevant feet are  
222 to human movement unless they had foot problems (pain or deformities). Most  
223 undertones around feet tended to be negative, with participants picturing themselves  
224 as having 'bad feet`.

225 *"(..) all deformed...and the toes are like this, they don't lift up" (Sofia, FG3\_PT)*

226 Feet were mostly either ignored or perceived as a source of discomfort, in both  
227 national groups. Foot problems appeared sometimes to be the main motivators for  
228 individuals to take any measures regarding foot health and foot function.

229 *“Yes. because they’re there and mine haven’t broken...So I hadn’t anything to think*  
230 *about it” (Louise, FG1\_UK).*

231 *“No! I didn’t think that because I don’t have other than cramps I don’t have a lot of*  
232 *stuff in my feet” (Ana, FG1\_PT)*

233 Regarding participants’ perceptions about foot care, these mainly concerned hygiene  
234 with some mention of skin and nail care.

235 *“(…) They’re there...They get washed and they cleaned and that’s it. ((Laughter))”*  
236 *(Louise, FG1\_UK)*

237 Care towards feet was more apparent in those with pre-existing problems (e.g.  
238 Diabetes Mellitus). These participants also demonstrated relatively more knowledge of  
239 other aspects of foot health (e.g. sensitivity), due to regular health check-ups.

240 *“I have been advised about foot health because I am a diabetic.”*  
241 *(Catarina, FG3\_PT)*

242 The Portuguese focus groups displayed overall more negative perceptions, with  
243 negative internal representation of feet. Sometimes fear of movement and low self-  
244 efficacy derived from previous injuries would come across participants’ remarks:

245 *“(..) And when it hurts, I say alright! I am not going to walk more. I’m going to stop it*  
246 *here. The pain is on the foot, but the head thinks.” Vera (FG3\_PT)*

247 Interestingly, there was an initial lack of awareness with participants from both nations  
248 on the range and type of movement available within the foot. The limited

249 understanding regarding the functional abilities of the foot as well as recognising the  
250 complexity of movement within the foot was evident across cultures.

251 *"I think when you know how you have to exercise your feet you (are) suddenly aware of*  
252 *how similar they are to your hands...Same bones (...) And I am horrified of how poor my*  
253 *feet are."* Louise (FG2\_UK)

254 *"Between tip toes and heel I didn't...I mean, I didn't think that it was as important as it*  
255 *really is."* Catarina (FG3\_PT)

256 In fact, going through the experience of doing the exercises and discussing them was  
257 portrayed as enlightening in many ways:

258 *"You know? (...) you take your feet for granted that you never give them a second*  
259 *thought...But this made you think about it"* (Sarah, FG3, UK)

260 *"No, I didn't think about it a lot. No one had explained it to me before. That walking on*  
261 *your tip toes or heels could be so important for balance. "* (Leonor, FG3\_PT)

262 This subtheme has emphasized how older adults hold a wide range of views about  
263 constructs surrounding feet, including self-awareness regarding movement and  
264 function, discomfort, and aesthetic and social features. Negative views were prevalent  
265 across national groups, particularly in Portugal.

266

267

268 ***(ii) Need to look at my feet and do the exercises***

269 Participating in the study appeared to influence older people's views on the value of  
270 specific ankle and foot exercise and self-management. Many admitted it had changed  
271 their awareness of the functional status of their ankle and foot complex.

272 *"It has raised awareness of the need to look at my feet and do the exercises. (...) I*  
273 *hadn't really thought very much about what we needed to do... And this was a wake-up*  
274 *thing". (Louise, FG1, UK)*

275 Most focus groups' members had not been aware that such exercises could be  
276 integrated into a falls prevention plan:

277 *"I also didn't, right, didn't know that these exercises were beneficial for falls and that."*  
278 *(Ana, FG2\_PT)*

279 Overall, participants were not used to doing specific foot exercises and expressed  
280 frustration at times with how challenging moving their toes could be.

281 *"My toes are all crippled (...) they don't lift up. Lowering even less so"*  
282 *(Sofia, FG3\_PT)*

283 Foot problems (e.g. toes deformities, arthritis) also posed an additional challenge to  
284 some of them.

285 *"And I've got arthritis... Well it's not severe...but doing the exercises was actually heavy*  
286 *going for me...on the barefoot ones..." (John, FG2\_UK)*

287 After they had tried the exercises, the idea of lower limb, ankle and foot exercises  
288 being beneficial to foot movement and feeling more stable, was repeatedly expressed  
289 by participants of both countries.

290 Some participants mentioned immediate improvements from the one-week trial,  
291 which seemed to relate with a sense of increased self-efficacy. Many participants  
292 appeared more confident of being able to self-manage their functional status, which  
293 helped with overcoming any initial difficulties that they had.

294 *“It’s just the fact that my toes didn’t do it, sit down and think about it, lack of*  
295 *use...Therefore get on and do something about it.” (Louise, FG1\_UK)*

296 The idea of ‘having a problem and doing something about it’ appeared to resonate  
297 across focus groups.

298 Other participants reported improvement of confidence, function or symptoms, such  
299 as pain, following doing the specific ankle and foot exercises.

300 *“I mean... even in a week (...) I feel as if I’m stronger.” (Lisa, FG2\_UK)*

301 *“The foot arch...These [the exercises] helped me...Helped with the pain that I had to go*  
302 *away...” (Catarina, FG3\_PT).*

303 Many participants demonstrated recognizing improved motor skills, but also being  
304 aware that their maintenance and improvement needs consistency over time.

305 *“Right, but this we need to continue doing it afterwards. I couldn’t lift my big toe*  
306 *either. And now I can...I can.” (Júlia, FG2\_PT)*



307 Links between disuse, functional importance of strength training and specificity of  
308 certain movement patterns could be traced across focus groups. Balance training was  
309 associated with an ability to better perform activities of daily living.

310 *“So, if someone does these exercises, improves their balance, mobility to...To being*  
311 *able to walk better and have a different balance. That’s what I think” (Vera, FG3\_PT)*

312 At times, participants clearly expressed believing that these exercises could contribute  
313 to maintaining their functional status on the longer term, including their ability to walk  
314 independently:

315 *“The stronger your legs get, the less chance you’ll need a Zimmer*  
316 *frame! “(Thomas, FG2\_UK)*

317 Even the most active participants seemed to identify specific functional gains that  
318 could be obtained from the exercises. They recognised that these would be working  
319 different muscles groups and attributes, completing other physical activities.  
320 Interestingly, these more in-depth reflections were more evident in the Scottish than  
321 Portuguese focus groups.

322 *“Although I think I’m like you, I’m quite active and I am out everyday walking. You’re*  
323 *not using the same muscles...You don’t feel you’re using the same muscles as the*  
324 *exercises pinpoint...They pinpoint the muscles being used “(Jean, FG2\_UK)*

325 This subtheme renders a growing understanding of the relevance of specific exercises  
326 as part of foot care by the participants, awareness of their own foot function; self-  
327 perceived value and implications of specific exercises within a falls prevention scope.

328 These were common underlying experiences in both national groups, despite an  
329 apparent lower physical literacy by Portuguese participants.

330 ***(iii) The important role of footwear***

331 Participants spontaneously brought up the role of footwear in their discussions.  
332 Footwear preferences were mainly driven by a search for comfort, without any specific  
333 guidance from health professionals. Even in the presence of health conditions such as  
334 injury or joint deformity.

335 *“No I’m the one who has to check what fits me” (Leonor, FG3\_PT)*

336 Several participants also expressed adjusting their footwear choice over the life  
337 course, as result of the ageing process.

338 *“It’s been many years since I’ve only used flat shoes” (Leonor, FG3\_PT)*

339 Scottish participants discussed more the idea of what “safe” footwear was in relation  
340 to their capabilities.

341 *“Aye. Have any of yous ever fell when ye had high heels on? Shoes with high heels?”*

342 (Thomas, FG2\_UK)

343 *“I don’t wear high heels now. I wouldn’t trust myself to be honest with high  
344 heels...Because I go over my ankle quite a lot... (...)”*

345 (Jean, FG2\_UK)

346 Despite exhibiting some concerns around footwear safety, inquiring about wearing  
347 loose slippers and being barefoot, participants were slightly surprised that footwear  
348 could influence falls.

349 *“I wasn’t aware of the role...The important role of footwear.” (Elaine, FG1, UK)*

350 An increased awareness that footwear could influence normal foot function,  
351 potentially increasing falls risk, appeared to arise from participating in this study for  
352 both national groups.

353 *“you brought up a point that I find with these... super comfortable [brand of trainers*  
354 *with gel insoles] ...But I... If they stick, I do tend to go forward. I’m not lifting my foot,*  
355 *obviously, high enough. Because it’s only since I got these that I’ve noticed that” (Jean,*

356 *FG2\_UK)*

357 Participants offered mixed remarks about being barefoot. Portuguese participants  
358 admitted to being barefoot more often and were more likely to wear sandals or flip  
359 flops because of the weather. Interestingly, different to the Scottish focus groups, no  
360 considerations about footwear preferences and falls episodes were expressed by  
361 them.

362 This subtheme shows how participants perceived footwear as a coadjutant to  
363 maintain/improve foot function, its contribution to falls risk; and both their reasoning  
364 and preferences when choosing shoes in their daily lives. Contextual differences  
365 between nations played a role on the latter.

## 366 Discussion

367 This is the first qualitative study to explore community-dwelling Scottish and  
368 Portuguese older adults' views about feet within a falls prevention scope. It is also the  
369 first study to offer insight into Portuguese older adults' perceptions about falls and  
370 exercise-based falls prevention. The main focus of the findings were participants'  
371 perception of their feet and how this links to understanding risk factors associated  
372 with falling and managing/minimising this risk potentially through specific foot  
373 exercises. It provides key information concerning a lack of awareness towards foot  
374 related falls risk factors and self-foot care within a falls prevention scope; including  
375 specific foot and ankle exercise in both national groups. Portuguese participants  
376 expressed more fatalistic views about falls, with some typifying their falls as  
377 unexplainable. This national group was also apparently less aware and informed that  
378 exercise could prevent falls.

379 A lack of awareness of falls related risk factors associated with their feet was  
380 predominant across both nations, even among Scottish participants who had previous  
381 experience with exercise-based falls prevention programmes. A recent meta-analysis  
382 suggests that foot problems are associated with falls in older adults; recommending  
383 health screening and specific referral within falls assessment<sup>3</sup>. Most participants  
384 mentioned having foot problems, which meant that they could potentially benefit  
385 from this information to their falls risk.

386 Portuguese participants presented more fatalistic views about falls; concurring with  
387 previous literature about other national groups<sup>8,9,25</sup>. *Fado* (destiny or faith) and  
388 catholic doctrine are rooted in Portuguese culture. Although religious beliefs can

389 contribute to developing a feeling of acceptance of falls, they can also act as a coping  
390 mechanism for older adults<sup>8</sup>. Faith-based social networks can also facilitate exercise  
391 engagement<sup>26</sup>. These could be considered when planning programmes in Portugal.

392 Some Portuguese participants characterised their falls as *unexplainable*, similar to  
393 older adults with visual impairment<sup>27</sup>. They were at a loss as to why they would fall,  
394 emphasizing that they had not received any information from health professionals.  
395 There are several reasons why participants may perceive that falls are not preventable  
396 or that they have not been provided with falls prevention education. Previous research  
397 has shown that older adults may not perceive themselves to be at risk of falling<sup>9,28,29</sup>,  
398 believe that falls are not a medical issue<sup>30</sup> or just assume that they are an inevitable  
399 consequence of ageing<sup>28</sup>. Believing that they should be more careful to avoid falls<sup>8</sup>,  
400 dismissing non injurious falls<sup>30</sup> or not wanting to burden family members<sup>25,31</sup> also  
401 appear to influence reporting of falls. Discussing falls may also cause anxiety<sup>30</sup>, being  
402 perceived as signs of functional decline and frailty<sup>28</sup>. All these aspects can contribute to  
403 older adults not discussing the issue of falls with health professionals<sup>9,28,29,30</sup>.

404 Concomitantly, health professionals also face several barriers to provide guidance to  
405 older patients regarding falls prevention and management, ranging from patient  
406 influence, to education training, to communication between staff and patients<sup>32</sup>. The  
407 lack of structured fall prevention guidelines and insufficient training has also been  
408 identified as a major barrier to health professionals providing advice on exercise to  
409 prevent falls<sup>33</sup>, which may be relevant in countries such as Portugal where there is not  
410 an established nationwide NHS guidance. Additionally, older adults often present  
411 competing clinical priorities with urgent medical issues being prioritized over falls in

412 the short time that health professionals have available to provide care<sup>34</sup>. Finally, it  
413 should also be noted that health messages may sometimes be misunderstood, or  
414 forgotten, by patients<sup>35,36</sup>. This might have also been reflected in our findings.

415 Interactions with health professionals can positively or negatively influence the uptake  
416 of falls prevention interventions, with older adults being more likely to participate in  
417 an exercise-based intervention if they are referred or encouraged to participate by a  
418 health professional<sup>30</sup>. Our findings appear to align with these findings, also highlighting  
419 that there is an opportunity for clinicians to address foot-related falls risk factors with  
420 their older patients. These aspects should be further researched from both the public  
421 and health providers' perspective and contemplated when planning interventions.

422 Participants admitted that feet are less prioritised than other body parts, agreeing with  
423 previous research<sup>4</sup>. Feet not being on display was the main reason given for this  
424 'neglect'. In our study, feelings of privacy were not mentioned by participants, unlike  
425 Mikkola et al's findings<sup>4</sup>. Appearance and body image are important to older adults, as  
426 they signpost personal identity, physical functionality, and social status; they are also  
427 influenced by sociocultural stereotypes of the ageing body<sup>37</sup>. Older adults may  
428 become self-conscious of age-related changes to feet morphology and appearance<sup>1</sup>,  
429 leading into overlooking them further. In fact, negative views of feet were common  
430 across focus groups, particularly among Portuguese. Foot problems were managed  
431 rather than prevented, a behaviour previously highlighted among other condition-  
432 specific and national groups of older adults<sup>4,6,38</sup>. Foot pain, discomfort and other  
433 problems were common complaints, concurring with strong quantitative evidence<sup>39</sup>.  
434 These were also the main motivators to seeking a medical appointment for foot

435 health<sup>4,38,40</sup>. Previous research has identified the importance of positive perceptions of  
436 healthcare to facilitate older adults' future foot consultations<sup>38,40</sup>. Our study reflects  
437 the same trend in both nations emphasizing the need for education.

438 Sometimes participants with a history of foot health problems admitted being  
439 protective of their feet, which would trigger some fear and avoidance of movement<sup>41</sup>.  
440 These potential manifestations of lower self-efficacy can perhaps relate to the fear-  
441 avoidance model of pain<sup>42</sup>. Reinforcing the role of health professionals in educating  
442 older adults about foot health and foot function management<sup>4,6,38</sup>, encouraging regular  
443 movement<sup>43</sup> and patient-provider communication processes<sup>44,45</sup> are important  
444 mediating agents in pain-related outcomes. Our findings also suggest that foot related  
445 issues could perhaps be further explored within the patient-provider communication  
446 processes.

447 As with Miikkola et al.<sup>4</sup>, our participants lacked knowledge of proper foot care which  
448 can negatively influence their foot health and foot function, and consequently their  
449 foot-specific falls risk factors. Only participants who had foot problems, or who were at  
450 a higher risk (diabetes mellitus) reported having received health information about  
451 foot self-care through their healthcare services<sup>6,38</sup>. However, assumptions about the  
452 quality of self-foot care cannot be made, as this was not explored in depth. This study  
453 found that specific foot and ankle exercises were not considered as a strategy for foot  
454 health, contrasting with other studies<sup>4</sup>. Most Scottish and Portuguese participants  
455 were unaware of the role of these exercises in falls prevention<sup>5</sup>, which had not been  
456 previously reported. Moreover, Portuguese participants had very little knowledge that  
457 exercise could prevent falls. Similar conclusions were found regarding other national

458 and ethnic groups <sup>7,8,11</sup>, but it is new for Portuguese older adults. Differences in the  
459 baseline characteristics of participants and healthcare resources between nations may  
460 have influenced our findings. Low health literacy and low education levels are  
461 predominant among Portuguese older adults<sup>46</sup>, which may have also contributed to  
462 the findings of this study. Our findings also suggest possible lower physical literacy  
463 among Portuguese participants<sup>47</sup>.

464 Some participants mentioned immediate benefits during the one-week trial (e.g. pain  
465 reduction, improvement of muscle strength, increased confidence). This may be a  
466 result of placebo effect related to exercise, particularly for those with negative beliefs  
467 about their physical abilities<sup>48</sup>. Furthermore, such self-perceived improvements may be  
468 coincidental. Motor learning may also have contributed to self-efficacy <sup>49</sup>, as  
469 participants reported observing an improvement in their motor performance. An  
470 increased self-awareness of foot function was often mentioned, with many reporting  
471 an improvement in observed motor function, potentially demonstrating  
472 responsiveness to the neuromuscular effects of specific ankle and foot exercises. This  
473 was shared across national groups, independent of previous experience with physical  
474 activity or exercise-based interventions, and it has not been previously reported in the  
475 literature; possibly, this may have been a manifestation of increased physical literacy<sup>47</sup>.

476 Focus groups reported that a specific exercise programme could improve the available  
477 range of motion, muscle strength, and balance in the longer-term, linking these as key  
478 abilities to performing their activities of daily living. The latter was highly valued,  
479 conforming with identified enablers of engagement in exercise-based falls  
480 interventions <sup>50</sup>. Scottish participants appeared to be more aware of the specificity of



481 these ankle and foot exercises, recognising extra functional elements to their regular  
482 physical activity routine. Portuguese were less expressive of specific contributions.  
483 Differences in physical literacy may explain these differences; the Scottish participants  
484 were overall more educated, more physically active, and considerably more  
485 experienced with exercise, all characteristics that contribute to greater levels of  
486 physical literacy<sup>47</sup>. However, Scottish participants also appeared to have increased  
487 their physical literacy in relation to foot function as a result of this study.

488 Preferences of footwear varied between nations due to weather conditions. Overall,  
489 participants expressed being originally unaware that footwear could influence falls,  
490 albeit being very curious about optimal footwear for foot health. Participants  
491 expressed that shoes should be individualised to their needs and comfort, aligning with  
492 existing evidence<sup>4</sup>. Most reported that they had not received any guidance about  
493 optimal footwear, with all admitting never been informed about footwear as a risk  
494 factor for falling. Footwear has been considered to possibly impact fall risk<sup>51</sup>, however,  
495 there is no conclusive evidence supporting a causal relationship between specific types  
496 of footwear and falls rates in healthy older adults<sup>52</sup>. Nonetheless, footwear impacts  
497 older adults' foot health<sup>53,54</sup>, including increasing the chances of acquiring foot  
498 problems (e.g. hallux valgus) associated with an increased falls risk<sup>3</sup>.

#### 499 **Implications for intervention development**

500 Our findings support the emphasis on regular educational components surrounding  
501 foot-related falls risk factors as part of specific ankle and foot exercise interventions  
502 for older adults. Participants exhibited a generally low physical literacy related to foot

503 function and specific ankle and foot exercises, these should be assessed and targeted  
504 by robust evidence-based educational components.

505 Falls prevention interventions developed for Portuguese older adults would benefit  
506 from accommodating the needs of a population with lower health and physical  
507 literacies. This may translate into reinforcing general falls educational components as  
508 well as providing greater individualized support when introducing exercise-based  
509 interventions to older adults.

### 510 **Limitations and future research**

511 This study has some limitations. Recruitment varied between nations due to  
512 contextual factors. Selection bias may have resulted in recruiting individuals more  
513 interested in these topics. It was not possible to interview those who declined to  
514 participate or dropped-out. Differences in characteristics of national groups  
515 (particularly age, education and current employment), and contextual settings, could  
516 have influenced our findings. Nonetheless, we used adequate approaches for each  
517 national setting and were able to capture cultural undertones across the data.

518 Participants had tried a lower limb, foot and ankle exercise programme for a week.  
519 Exploring views separately from participation in a programme may better differentiate  
520 between baseline and acquired knowledge, in future studies.

521 Future research should also explore the views of health professionals, involved in falls  
522 management, about the role of foot related conditions and their relationship to falls  
523 risk, as well as exercise-based interventions to assist reduce the risk of falls in older  
524 people. Resulting evidence could inform clinical practice. More qualitative studies

525 exploring Portuguese older adults' views about falls prevention would enable culturally  
526 adequate evidence to inform national public health policies.

## 527 **Conclusions**

528 By performing a thematic analysis of focus groups interviews, we found that Scottish  
529 and Portuguese older adults had little knowledge of foot related risk factors associated  
530 with feet, being unaware of the functional status of their feet and of the role of  
531 specific lower limb, ankle and feet exercise in foot care and falls management. Feet  
532 were described as neglected body parts, with problems being managed rather than  
533 prevented. Footwear was not considered for reducing falls risk. Participating in the  
534 study contributed to an evolved awareness about these topics. Furthermore,  
535 Portuguese participants demonstrated little knowledge about general falls-risk factors  
536 and falls prevention strategies, with some displaying a fatalistic outlook, or considering  
537 falls to be unexplainable. Such aspects could be considered when developing culturally  
538 appropriate interventions.

## 539 **List of abbreviations**

540 UK- United Kingdom

541 PT- Portugal

542 FG- Focus Group

543 NHS – National Health Service

544 **Declarations**

545 **Ethics approval and consent to participate**

546 Approval was granted by the School of Health and Life Sciences Research Ethics  
547 Committee of Glasgow Caledonian University (HLS/PSWAHP/17/147) and the  
548 Portuguese National Data Commission (CNPD nº 1760/ 2018). Participants gave  
549 written informed consent.

550 **Consent for publication**

551 Not applicable.

552 **Availability of data and materials**

553 The data excerpts supporting the conclusions of this article are included within the  
554 article (and its additional file 1). Further anonymized data may be available on  
555 reasonable request from the corresponding author. The original focus groups audio  
556 recordings are not available to ensure the anonymity and confidentiality of the  
557 participants.

558 **Competing interests**

559 Dr. Gordon Hendry is an Associate Editor UK of the Journal of Foot and Ankle Research.  
560 It is journal policy that editors are removed from the peer review and editorial  
561 decision-making processes for papers they have coauthored. Professor Dawn A.  
562 Skelton is a Director of Later Life Training, a not for profit training organisation  
563 delivering exercise training to health and fitness professionals in the UK and Europe.  
564 The remaining authors declare no conflicts of interest in relation to this work.

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570 study.

571

572 **Authors' contributions**

573 MC conceptualized the study and methodology, collected all data, performed thematic  
574 analysis, was responsible for all aspects of the project administration and funding  
575 acquisition, also wrote the original drat and the subsequent. GH and DAS supervised,  
576 contributed to the conceptualization and methodology, participated in data collection,  
577 gave inputs for the thematic analysis, and reviewed and edited the manuscript. JW  
578 supervised, provided support with the research resources, reviewed and edited the  
579 manuscript. All authors read and approved the final manuscript.

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587 **Additional material**

588 We have submitted an Additional file 1. pdf which contains 4 appendices: Appendix 1  
589 includes the recruitment flowcharts for both nations, appendix 2 is the focus group  
590 interview guide, appendix 3 includes more illustrative quotes for the theme and each  
591 subtheme, and appendix 4 is a completed reporting checklist for qualitative study.

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