

### **Table C.1.e. Sarcopenia**

#### **Search and selection strategy**

A search for existing systematic reviews was conducted in PubMed for reviews published from 2008 up to November 2019 (Appendix 2).

Two reviewers independently screened titles and abstracts of potential systematic reviews. Where there was uncertainty about the eligibility of a study, the full text was retrieved. Two independent reviewers read full-texts and assessed eligibility criteria using an electronic screening form. Disagreements regarding the eligibility of studies were resolved through discussion and, when necessary, with the help of a third reviewer.

Since we did not find any eligible systematic reviews, we identified reviews that included potentially eligible studies and screened all included studies against our questions. We included individual studies (instead of reviews).

One reviewer extracted information into standardised forms and a second reviewer checked all data. We extracted all outcome measures relevant to sarcopenia and frailty reported by the studies that were included. We selected the most commonly reported outcomes across the included studies to provide an overview of the evidence.

#### **Physical activity classification**

We used the Prevention of Falls Network Europe (ProFANE) taxonomy to classify the physical activity and exercise programmes in the included studies (Appendix 3).<sup>(30)</sup> The programmes were classified as primarily involving the following exercise categories: (i) gait, balance, coordination and functional task training (referred to as 'balance and functional exercises' for simplicity); (ii) strength/resistance training (including power training, using resistance so referred to as 'resistance exercises'); (iii) flexibility; (iv) three-dimensional (3D) exercise (with Tai Chi or dance subcategories); (iv) general physical activity (walking programmes); (v) endurance; (vi) overall physical activity; (vii) other.

#### **Grading the body of evidence**

Using the GRADE framework, we examined the quality of primary research and assessed the overall quality of evidence in terms of presence and extent of five factors: risk of bias, inconsistency, imprecision, indirectness and publication bias. Details on the criteria used to apply the GRADE approach are provided in Appendix 4. We also undertook random-effects meta-analyses to summarise the effects of physical activity where there was more than one study.

## The relationship between physical activity and frailty/sarcopenia prevention in older people

| No. of studies   | Design                          | Quality assessment                   |                                       |                                      |                                  |       | No. of participants | Summary   | Quality               |
|--|---------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|----------------------------------|-------|---------------------|---|-----------------------|
|  |                                 | Risk of bias                         | Inconsistency                         | Indirectness                         | Imprecision                      | Other |                     |   |                       |
| <b>The association between physical activity and frailty prevention</b>  |                                 |                                      |                                       |                                      |                                  |       |                     |   |                       |
| Only 1 RCT investigated the association between physical activity and frailty prevention. The follow-up length was 12 months. Frailty outcome was defined as the presence of three or more Fried criteria: (1) unintentional weight loss, (2) exhaustion, (3) low physical activity, (4) slow walking speed, and (5) poor grip strength.   |                                 |                                      |                                       |                                      |                                  |       |                     |   |                       |
| 1  | RCT <sup>a</sup>                | Serious risk of bias <sup>b</sup>    | No serious inconsistency              | No serious indirectness              | Serious imprecision <sup>e</sup> | None  | 133                 | Physical activity interventions may prevent frailty. <sup>f</sup>   | Low <sup>g</sup>      |
| <b>The association between physical activity and sarcopenia prevention</b>   |                                 |                                      |                                       |                                      |                                  |       |                     |   |                       |
| Only 1 longitudinal study investigated the association between physical activity and sarcopenia prevention. The follow-up length was 48 months. Sarcopenia was defined as low muscle mass, low muscle strength and/or low physical performance.  |                                 |                                      |                                       |                                      |                                  |       |                     |   |                       |
| 1  | Longitudinal study <sup>h</sup> | No serious risk of bias <sup>i</sup> | No serious inconsistency <sup>j</sup> | No serious indirectness <sup>d</sup> | Serious imprecision <sup>k</sup> | None  | 4,000               | We are uncertain whether physical activity prevents sarcopenia.   | Very low <sup>m</sup> |
| <b>Exercise vs control on frailty-related outcomes</b>   |                                 |                                      |                                       |                                      |                                  |       |                     |   |                       |
| A total of 4 RCTs investigated the effects of physical activity on frailty-related outcomes. The frailty-related outcomes were: (1) muscle mass measured with leg press with 1RM method, isokinetic dynamometer and hand dynamometer; (2) physical function measured with 6-m, 10-m and 12-m walk, Timed up and go and Short Physical performance Battery test (SPPB); (3) muscle mass measured with dual-energy x-ray absorptiometry (DXA). |                                 |                                      |                                       |                                      |                                  |       |                     |   |                       |
| 4  | RCTs <sup>n</sup>               | Serious risk of bias <sup>o</sup>    | No serious inconsistency <sup>p</sup> | No serious indirectness <sup>q</sup> | Serious imprecision <sup>r</sup> | None  | 326                 | 16/18 comparisons showed a positive effect for physical activity, 1/18 showed a neutral effect, and 1/18 showed negative effect for physical activity for frailty-related outcome. Physical activity interventions may prevent frailty-related outcomes. <sup>s</sup> | Low <sup>t</sup>      |
| <b>Exercise vs control on sarcopenia-related outcomes</b>  |                                 |                                      |                                       |                                      |                                  |       |                     |   |                       |
| A total of 2 RCTs investigated the effects of physical activity on sarcopenia-related outcomes. The sarcopenia-related outcomes were: (1) muscle strength measured with isokinetic dynamometer; (2) muscle mass measured with dual-energy x-ray absorptiometry (DXA).  |                                 |                                      |                                       |                                      |                                  |       |                     |   |                       |
| 2  | RCTs <sup>u</sup>               | Serious risk of bias <sup>v</sup>    | No serious inconsistency <sup>w</sup> | No serious indirectness <sup>q</sup> | Serious imprecision <sup>x</sup> | None  | 204                 | All studies (4/4) showed a positive effect for physical activity on sarcopenia-related outcomes. Physical activity interventions may prevent sarcopenia-related outcomes. <sup>y</sup>  | Low <sup>z</sup>      |

<sup>a</sup> Includes 1 RCT(31)

<sup>b</sup> We downgraded the evidence by one level as the study had a PEDro score <6/10

<sup>e</sup> The single included study had a total of 133 participants analysed. Therefore, we downgraded the evidence.

<sup>f</sup> The effects for the study can be found in Table 3.

<sup>g</sup> Quality of the evidence was downgraded from high to low because of serious risk of bias and serious imprecision.

<sup>h</sup> Includes 1 longitudinal study(32)

<sup>i</sup> We did not downgrade the evidence as the study was at low risk of bias

<sup>j</sup> Not applicable.

<sup>k</sup> We downgraded the evidence as there was only one included study.

<sup>l</sup> The effects for the study can be found in Table 4.

<sup>m</sup> Quality of the evidence was downgraded from low to very low because of serious imprecision.

<sup>n</sup> Includes 4 RCTs.(33-36)

<sup>o</sup> We downgraded the evidence by one level as 3/4 studies (75%) had a PEDro score <6/10.

<sup>p</sup> We did not downgrade the evidence due to heterogeneity of included studies as most comparisons (16/18 comparisons) showed a positive effect.

<sup>q</sup> Since we only included similar studies in terms of population, intervention, comparator and outcome, we did not downgrade the evidence based on this criterion.

<sup>r</sup> The 4 included studies had a total of 326 participants analysed. Therefore, we downgraded the evidence.

<sup>s</sup> The effects for each individual study can be found in Table 5.

<sup>t</sup> Quality of the evidence was downgraded from high to low because of serious risk of bias and serious imprecision.

<sup>u</sup> Includes 2 RCTs.(37, 38)

<sup>v</sup> We downgraded the evidence by one level as 1/2 studies (50%) had a PEDro score <6/10.

<sup>w</sup> We did not downgrade the evidence due to heterogeneity of included studies as all comparisons (4/4 comparisons) showed a positive effect.

<sup>x</sup> The 2 RCTs had a total of 204 participants analysed. Therefore, we downgraded the evidence.

<sup>y</sup> The effects for each individual study can be found in Table 6.

<sup>z</sup> Quality of the evidence was downgraded from high to low because of serious risk of bias and serious imprecision.