

CA20104 – Network on evidence-based physical activity in old age (PhysAgeNet)

Deliverable D1.5

D1.5- Consensus paper and roadmap on EBM for PA interventions submitted for publication

Contributors

Working Group 1

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1. INTRODUCTION

Comprehensive reporting of exercise interventions is essential for reproducibility, systematic reviews and meta-analyses, and the development of evidence-based exercise programs for older adults [Wollesen et al., 2024]. Complete reporting increases transparency, allowing readers to assess methodological quality and potential bias [Blanco et al., 2024], and helps identify gaps in the evidence base.

The EQUATOR Network (Enhancing the Quality and Transparency of Health Research) promotes discipline-specific reporting guidelines to improve accuracy and reliability in health research [Page, Hoogenboom & Voight, 2017; Whyte et al., 2021]. However, inconsistent and incomplete reporting hinders replication, synthesis, and translation into practice.

Exercise interventions present unique challenges due to their complexity, multimodal nature, and need for personalization. Compared to drug trials, exercise trials often show lower methodological quality, higher bias risk, and less frequent reporting of adverse events [Hansford et al., 2022; Hansford et al., 2024]. Studies comparing reporting tools such as TIDieR, CERT, and i-CONTENT [Kattackal et al., 2020; Hoogeboom et al., 2021; Davidson et al., 2021] indicate that supplemental intervention details improve reproducibility, though existing guidelines lack specificity for exercise-based interventions.

While current tools help standardize reporting (cf. [Slade et al., 2016; Hoffmann et al., 2014]), they miss aspects specific to older adults. High heterogeneity, multimorbidity, and psychosocial variability [WHO, 2024; Cesari, Calvani & Marzetti, 2017; Beard et al., 2016] increase the risk of incomplete reporting. Factors such as multimorbidity profiles [Martínez-Velilla et al., 2022], baseline functional status [Layne et al., 2017], cognitive impairment [Di Lorito et al., 2020; Dieckelmann et al., 2023], and mental health [Noetel et al., 2024; Shaw et al., 2022] influence intervention effects and adherence. Moreover, digital literacy and technology access affect engagement in technology-supported exercise [Buyl et al., 2020; Jiang et al., 2024]. Thus, careful documentation of study design and participant characteristics is needed [Hardy, Allore & Studenski, 2009; Hawley-Hague et al., 2016; Lau et al., 2023].

Detailed reporting of exercise parameters—frequency, intensity, time, and type (FITT) [ACSM 2022]—as well as setting, adherence, and dropout reasons [Picorelli et al., 2014] is often missing. This hampers replication, bias assessment, and meta-analytic synthesis [El Hadouchi et al., 2024; Milat et al., 2020]. Additionally, links between hypotheses, outcomes, and theoretical models are frequently underreported [Conn et al., 2003].

Existing reporting guidelines [Slade et al., 2016; Signal et al., 2024] were not designed for older adults and often lack specificity regarding FITT principles or digital delivery. Consequently, key intervention descriptors remain incomplete [El Hadouchi et al., 2024]. These limitations highlight the need for PETIO, a population- and context-specific reporting extension for exercise in older adults.

Although non-randomized designs are common in this field, our focus on randomized controlled trials is intentional, as they represent the methodological gold standard. Standardized and comprehensive reporting of exercise interventions—including FITT

characteristics—will enhance generalizability, replication, and the development of tailored, evidence-based exercise programs for diverse aging populations.

2. AIM OF THE CONSENSUS PAPER

Building on the existing Consolidated Standards of Reporting Trials (CONSORT) guidelines for randomized controlled trials and taking into account the specific characteristics of exercise interventions in old age, we present an extended reporting guideline designed to improve the transparency, quality, and completeness of exercise intervention descriptions, and to ensure that the demonstrated benefits for older adults can be accurately interpreted, replicated, and translated into practice

3. DEVELOPMENT OF THE CONSENSUS PAPER

The consensus paper was derived out of the guideline process (cf. Deliverable 1.3). The guideline was developed through a six-stage process using a rigorous, systematic approach that included a review of existing reporting standards, expert consultations, and iterative refinement based on stakeholder feedback, following the principles of Moher [39]. An interdisciplinary group was formed (e.g., exercise and movement scientists, physiologists, health professionals, psychologists). The process comprised an initial Delphi survey (Stage 1), literature reviews (Stage 2), face-to-face meetings and group discussions (Stages 3 and 5), and consensus questionnaires (Stages 4 and 6). The focus was on reporting randomized controlled trials (RCTs) evaluating physical exercise interventions in older adults. Afterwards the results were summarized in a manuscript for publication for the Journal “European Review of Aging and Physical Activity” (IF: 3.5).

4. ROADMAP ON EBM FOR PA INTERVENTIONS

Altogether, the process led to the final guideline, which included all items and their explanations (cf. Supplemental Material - <https://zenodo.org/communities/egrapa/records>). The Figure provides an overview of the key considerations for reporting exercise intervention studies with older adults.

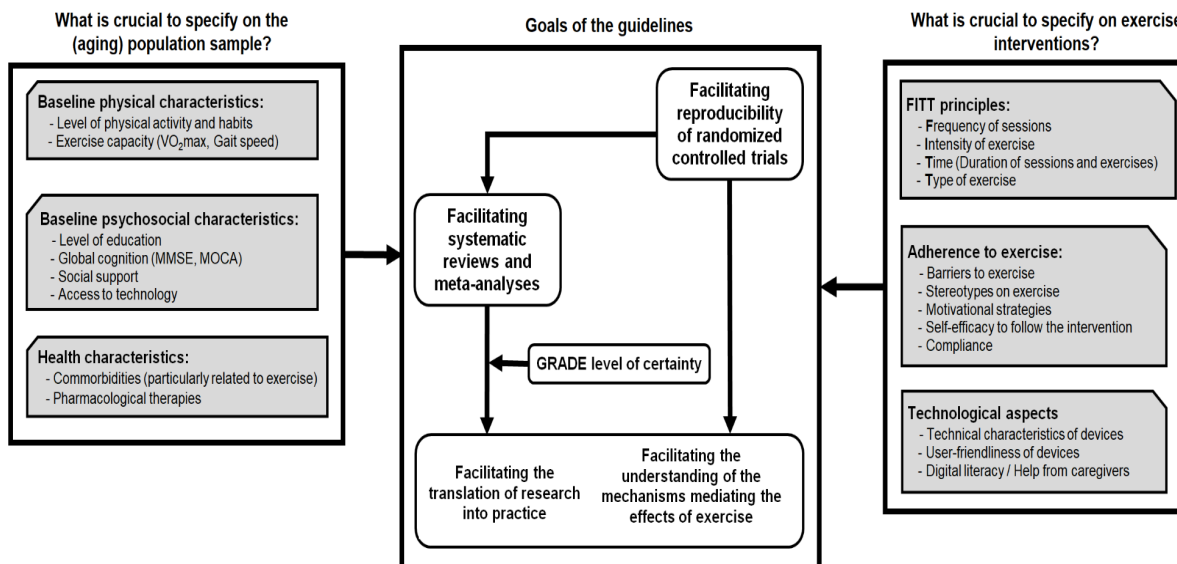


Figure 1 Final overview of the guideline context factors of PETIO reporting guidelines

Implementation of the newly developed reporting guideline for exercise interventions in older adults will enhance the clarity, completeness, and clinical applicability of study reporting in this field. Piloting the guideline across research groups would assess its feasibility and perceived value among end users. A mixed-methods evaluation could combine quantitative surveys to assess clarity and usefulness with qualitative interviews exploring benefits such as improved reporting of adherence, adverse events, and participant feedback.

Editors have indicated that the guideline could strengthen reporting, particularly regarding tailoring to age-related limitations, safety adaptations, and adherence tracking. Training materials and resources (e.g., templates, online presentations) will be essential for uptake, with future steps including development of supporting materials and a digital implementation tool (e.g., interactive checklist or form). Broader stakeholder engagement, including journal editors and older adult representatives, as well as translation into other languages via PhysAgeNet, is planned.

PETIO is designed as a reporting tool, not a quality rating scale. Empirical validation (potentially integrating GRADE or ROB2 frameworks) may help establish quality thresholds. The GRADE approach provides a framework for evaluating evidence based on study design, bias, inconsistency, imprecision, and effect size [GRADE working group, 2004]. Risk of bias in RCTs is often assessed with the ROB2 tool [Higgins et al., 2019], covering five domains: (1) bias from randomization; (2) deviations from intended interventions; (3) missing data; (4) outcome measurement; and (5) selective reporting.

In behavioral studies (e.g., exercise, cognitive behavioural therapy), blinding is often infeasible, increasing risk of bias, particularly in Domain 2. This can be mitigated by tracking external physical activity, measuring participant preference before randomization, and assessing satisfaction post-intervention. Domain 4 bias may arise from self-reported outcomes (e.g., mood, quality of life); using blinded external assessors can reduce this. Improved assessment tools for reporting quality may further minimize bias in behavioral trials.

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