that, as previous research suggests, speci cally focus on executive functioning processes [17] as training parameters, and especially on divided attention [18]. Intervention settings should thereby include enriched environments that provide physical activities with decision-making opportunities because these are believed to be able to facilitate the development of both motor performance and brain functions [19,20]. Unclear, however, is whether these improvements translate to a more behavioural level, e.g. to gait under dual task test conditions.

New treatments usually have to go through a series of phases to test whether they are safe and e ective [21]. e aim of this pilot study was to perform a phase II trial according the model for complex interventions advocated by the British Medical Research Council [22] to test the e ects of a traditional strength and balance training program that also included a dance simulation computer game in a group of elderly people. e study aimed to (1) develop an exercise intervention based on principles of exercise physiology and motor learning and to deliver it to older individuals, (2) evaluate the feasibility of the intervention and the ability to recruit and retain elderly subjects, and (3) assess whether the treatment had some e ect on relative dual task costs of walking.

Methods

Participants

A sample of 35 older people living in assisted living facilities volunteered to take part in the study. e project was given ethical approval by the Canton Zurich's research ethical committee (EK-Nr. 02/2009 (ETH)), and all volunteers provided written informed consent to take part in the study. e trial was registered under ISRCTN05545178.

Study design and procedures

Procedures: A controlled clinical trial was conducted where participants were recruited from three senior citizens assisted living facilities (Trotte, Stampfenbach & Oberstrass) in Zurich, Switzerland. Inclusion criteria were residential status, age over 65 years, signed informed consent statement, and the ability to walk 6 m and stand upright for at least 5 minutes. Participants were excluded if they had severe cognitive impairment (Mini-Mental State Examination below 22 points [23]), rapidly progressive or terminal illness, acute illness or unstable chronic illness, and had impaired vision that prevented them to watch a wall screen projection. All eligible residents were invited to attend an information session in which the content of the intervention and the study design were explained. Participants who attended the information session and agreed to participate in the study were allocated into the control group usual care (UC; residents of Stampfenbach) and the exercise-game group (EGame; residents of Trotte & Oberstrass).

Computer game exercise program: Participants allocated to EGame underwent a regimen of twice weekly progressive resistance training of the core and lower extremities muscle groups, progressive postural balance training and progressive computer game dancing for twelve weeks.

e muscle groups for the strength training were chosen because of their importance in functional activities [24,25], and were trained in standing position. During standing participants were secured with ropes they could hold on to (Redcord AS, NO-4920 Staubo, Norway). e ropes were xated on the ceiling or on frames (Figure 1A). e focus of exercise was on functional activities of daily living such as walking, standing up from a chair, sitting down or stair climbing. e

position and timing information that was then used to provide participants with real-time visual feedback.

A room in every assisted living facility that was easily accessible to the older people was dedicated for the set-up of the training equipment. All classes started with 5-10 minutes of warm-up activities, followed by 10-15 minutes of strength training exercises, 10-15 minutes of balance skills training, 1.5-7.5 minutes of computer game dancing, and 5-10 minutes of cooling-down activities. Training sessions lasted 45-60 minutes and were separated by at least one day of rest. All exercise sessions were supervised individually by two quali ed exercise trainers.

Usual care: All participants in UCare underwent a regimen of once a week 30 to 45 minutes of training that was o ered in the assisted living facility under the guidance of quali ed leaders in "Sports for Seniors" (Seniorensportleiter). is is a quali cation received from the Swiss Federal O ce of Sport (BASPO; www.baspo.admin.ch) and acknowledges that the exercise leader has been educated and is quali ed to develop and implement health enhancing physical activity programs for adult populations. Participants in UCare were performing exercises in a group while mainly seated on a chair. e seats were aligned circularly. e chairs were un a on1 a leri6(e)-43(l)-143(71.222 T]TJT*[("26(c)-14((r)4(i)5(62(5))-1-7123(r)JT4)

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the SPSS (version 17.0) so ware program (SPSS Inc. Chicago, IL, USA). All available data were analysed by initial group assignment. A comparison of the dichotomous variables (male/female gender; walking aids/no-walking aids) was undertaken using the chi squared test. Demographic characteristics were compared with Student's t-tests. A repeated-measures general linear model was used to test chantegoudioup ePiek124(Pie6(c)-15(-103(d)-20(a)2a(a)-20(s)-()34D)-8(eT-1(pC11(t))-184(o)3(f)-284(o)-11(a)-37(l)-32(k)-40(i)-24(n)-4(g)-184(f)52

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