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Original paper

Exercise for falls prevention in older people: Assessing the knowledge of exercise science students

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Abstract

Participation in appropriate exercise can help reduce the risk of falls and falls injury in older people. Delivery of population-level exercise interventions requires an expert workforce with skills in development and delivery of group exercise programs and prescription of individually targeted exercise. This study assessed the current knowledge of university exercise science students (as future exercise professionals) across different levels of study. A structured survey designed to assess knowledge in relation to falls in older people and exercise prescription for falls prevention was administered during second, third and fourth year lectures in seven Australian universities. Students' knowledge was assessed as the percent of correct responses. Overall, 566 students completed the survey and knowledge levels increased significantly with study year. Mean knowledge levels were significantly <70%, indicating limited knowledge. They were lowest for falls risk factor questions and highest for issue/cost related questions in second and third year students. Fourth year students had best knowledge about falls interventions and this was the only group and topic with a mean score >70%. In conclusion, knowledge about falls and exercise prescription for falls prevention in current students does not meet a desired competency level of 70% and is therefore insufficient to ensure an adequately equipped future workforce in this area. There is a clear need for the development and widespread delivery of an evidence-based "exercise for falls prevention" curriculum module for exercise professionals.

Keywords: Exercise; Accidental falls; Aged; Injury prevention; Exercise prescription; Capacity building; Curriculum development; Undergraduate education; Workforce; Training

1. Introduction

Falls present one of the most serious and costly problems associated with older adulthood. One in three community-dwelling people aged >65 years experience at least one fall each year[1] and more than 30% of fallers sustain injuries severe enough to require medical attention.[1,2] Falls are the leading cause of injury-related hospitalisation in older people and often mark the beginning of a decline in function and independence. In economic terms, the direct and indirect costs associated with falls are great and are predicted to contribute a considerable burden on the health care system in future years.[3]

There is evidence that falls are not an inevitable part of ageing and are in fact preventable. Exercise plays a major role in modifying falls injury risk factors and preventing falls in older people,[4,5] with clinically significant reductions in falls rates following exercise interventions demonstrated in randomised controlled trials and recent meta analyses.[6–8]

There are increasing health agency policy directives and clinical recommendations promoting exercise as a key strategy for falls and injury prevention.[9–11] Historically, particular health professionals, such as physiotherapists, have been largely responsible for the prescription and delivery of exercise for older people in Australia. However, workforce

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capacity needs indicate that the reliance on these professionals as the only deliverers of exercise interventions for falls prevention is unsustainable and a non-generalisable approach. There is a clear role for trained exercise professionals to deliver these necessary exercise interventions to prevent falls in older people.[12]

This paper presents the surveyed knowledge levels of a future exercise professional workforce in relation to falls prevention. In particular, the extent to which current Australian undergraduate human movement and exercise/sport science students and postgraduate exercise rehabilitation students have the pre-requisite knowledge to prescribe exercise for falls prevention in older people was assessed. The survey focussed on students' knowledge about falls risk, falls injury prevention and exercise prescription for older adults. As there is a lack of specific courses dedicated to the issue of falls in older people and exercise for falls prevention, it was hypothesised that students would have limited knowledge levels. Due to the integration of some topics related to ageing in existing courses, it was also hypothesised that there would be greater knowledge with increasing year of study.

2. Methods

The sampling units were classes of students, identified according to university and year of study. Seven universities across the Australian states of Victoria (three urban, one regional) and New South Wales (two urban, one regional) were invited to participate. Universities were chosen because they had well-recognised exercise science/human movement training programs and together offered a maximum of 1041 second, third and fourth year student places. Sampling ensured a broadly representative and large enough sample to give a reasonably precise (i.e. ±5%) estimate of the proportion of correct responses to the survey.

Initial telephone contact with relevant university staff was followed up by a formal letter of invitation that was accepted by all seven universities. The department head or year level coordinator nominated classes across three years of study. One university did not nominate a second year class and another did not nominate a fourth year class.

During September–October 2007, a researcher visited each university to administer the survey. During nominated lecture times, students were given brief information about the survey and completion of the survey was taken as implied consent to participate. In all but two classes, all students attending the nominated lecture agreed to participate. The survey was completed during lecture times, usually within 10–15 min and collected immediately.

The survey examined knowledge in relation to falls in older people and exercise prescription for falls prevention. Preliminary questions categorised each student's university, degree, year of study, age and gender. The knowledge component consisted of 41 items, including multi-choice (Part A), true/false (Part B) and ranking (Part C) questions, chosen in the interest of time efficiency and objective scoring. Although the survey was not formally validated, it drew heavily on similar assessment questions previously used by the researchers and underwent extensive expert validation and pilot testing. The knowledge survey is presented in Supplemental File 1.

The 31 questions in Part A required students to choose one of four stated alternatives. Each correct answer scored one mark, with a maximum Part A score of 31. Items were further categorised according to topic area: burden and cost of falls (ten questions); risk factors and assessment (five questions); physiology and biomechanics of balance and gait (nine questions); falls prevention interventions (seven questions). The percentage of correct items overall and in each topic was calculated.

Seven Part B questions required students to indicate a yes/no response to given statements. Up to seven statements were given per question. Correctly answered statements were allocated one mark. The final score was the percent correct (from a maximum of 52).

Three Part C questions required students to rank a list of specified exercises as would be appropriately progressed. Each correct sequence was awarded one mark; a half mark was given where only one mistake existed in the ranking order. The final score was the percent correct (from a maximum of 3).

To provide exercise services to older people, exercise professionals should have a high level of knowledge about falls injury risk and exercise for reducing this risk. For this reason, the survey results were assessed against a desired baseline benchmark level of 70% correct, corresponding to university standards of what is regarded as enhanced knowledge in students.[13] The survey was designed, so that the difficulty of questions reflected the requisite level of knowledge that would be commensurate with someone responsible for developing exercise programs and prescribing exercise in this area.

The study was approved by the University of Ballarat Human Research Ethics Committee. Survey scoring and analysis was undertaken using SPSS 15.0 for Windows (SPSS Inc., Chicago, USA). Results are presented separately for each of Parts A, B and C.

To account for the sampling frame, whereby students were sampled through group classes at a given year level within a specific university, adjustment for clustering effects was made.[14] Differences between universities/states/regions were not of interest and therefore not assessed; however, potential university effects were accounted for in the analysis. Hierarchical Generalised Linear Modelling (GLM)[15] was used to calculate estimated marginal mean (EM) scores overall, and across survey sub-components. The Hierarchical GLM-EM model tested differences across year levels for all survey parts, and across topics within Part A, against the 70% null hypothesis level by the Wald Chi-square statistic.