PALGRAVE HANDBOOKS

THE PALGRAVE HANDBOOK OF AGEING AND PHYSICAL ACTIVITY PROMOTION

Edited by
Samuel R Nyman, Anna Barker, Terry Haines,
Khim Horton, Charles Musselwhite,
Geeske Peeters, Christina R Victor,
and Julia K. Wolff

The Palgrave Handbook of Ageing and Physical Activity Promotion

"With advancing years people find themselves out of breath climbing the stairs or walking uphill, so they take to the lift or the wheels, thereby exacerbating the problem.
I always advocate physical activity whether to be able to keep climbing stairs, regain confidence, or to just feel good. This Handbook provides the latest scientific evidence for why we all need to keep active in later life and the different ways we can support older people to keep active and well."

—Jane Asher, aged 86, is an elite Masters swimmer. She set her first Masters World Record in 1986 in the 55–59 age group and has since set another 186 records across different age groups, strokes, and distances.

"It is evident that we must meet the challenges of old age not only at the level of the individual but also at the level of society. This timely Handbook provides the first interdisciplinary review of physical activity—perhaps our most valuable strategy to enhance wellbeing in late life. With topics ranging from exercise physiology and the well-established clinical benefits to broader issues such as epidemiology, population health, and psychological and social considerations, this volume will be an indispensable reference for researchers, practitioners, and advanced students."

—John W. Rowe, *MD, President, International Association of Gerontology and Geriatrics*

"Given the hugely important topic of physical activity in the context of healthy ageing, this Handbook will be a 'go to' source for some time. It is comprehensive in its coverage and will appeal to students, researchers, and practitioners. In addition to the importance of covering the health outcomes of physical activity among older adults, the Handbook gives appropriately extensive coverage to what physical activity to promote, how to maximize participation, how to implement activities for this population, the social and environmental factors influencing participation, and issues and debates. This is a marvellous resource."

—Professor Stuart Biddle, *University of Southern Queensland*

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Foreword

In my experience, people are more concerned about the problems of ageing than they are enthused about the benefits of advancing years. Common worries are physical and mental decline, losing friends and loved ones, financial limitations, and loss of function and independence. These overshadow the advantages of wisdom, greater freedom in use of time for enjoyable pursuits, opportunity to contribute more to society, emotional equanimity, and ability to put life's inevitable turmoil in perspective. Wouldn't it be great if there was something that could diminish the complications and amplify the joys of ageing? Fortunately, there is one thing that has the ability to grant most people a seemingly impossible long list of wishes. Of course, physical activity is that thing that could make the ageing process less debilitating and more fulfilling.

Unfortunately, people become less active as they grow older, and in some countries the reduction is dramatic. Even worse, industrial and technological forces over the past couple of centuries have produced never-ending innovations to make physical activity unnecessary. Tragically, we have been designing cities, roads, and buildings that make physical activity unpleasant, unsafe, or even impossible. At this historical moment, we are seeing the collision of a global population explosion of older people and a world that is increasingly well designed to discourage physical activity. The result is a global public health train wreck, resulting in needless loss of life and preventable suffering.

The *Palgrave Handbook of Ageing and Physical Activity Promotion* comes at a critical time with the goal of providing evidence-based solutions to some of the world's biggest health and economic problems. Late-life healthcare costs are expected to threaten the viability of not only healthcare systems but national economies as well. Physical activity is a unique solution because of the range of documented benefits that lead to both longer life and better

quality of life. However, physical activity also may be unique in the difficulty of intervening effectively. The barriers to physical activity range from biological factors that reduce people's ability to obtain pleasure from movement as they grow older, to cultures that devalue physical activity, to economic forces and environments designed to discourage active living.

This book has many elements of a real solution. It is organised by ecological levels, so the reader will learn about effective approaches at multiple levels. To implement the multi-level interventions that will be needed, multiple disciplines and sectors will need to work together. The interdisciplinary thought leadership of the book editors helps break down disciplinary boundaries that impede integrated solutions. The book has a variety of audiences who will need to understand the problems and solutions so they can design and implement effective interventions: researchers, practitioners, and students from multiple disciplines. Thus, this book can be viewed from distinctly different perspectives, like a 3-D puzzle. The book has a depth of information for each audience, for each discipline, and at each level of intervention.

The reader will learn that research has generated effective interventions at each level. The biggest problem is that very few of the solutions are being implemented widely. This book is a well-designed instrument for putting into practice what we have learned—and doing so across the globe. This book is a big step towards improving physical activity among older adults so they can avoid the decline in quality of life that people fear and enhance physical and mental vigour so people can thrive and enjoy their later years. As you read this book, please consider what contribution you can make, working with interdisciplinary groups, to implement the effective strategies summarized in the following pages.

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Preface

In this handbook, our aim was, for the first time, to provide a text that brought together the different relevant disciplines required to understand the multidisciplinary issue of how to promote physical activity among older people. This required a section devoted to each relevant discipline and a co-editor with expertise from that discipline. Therefore, this handbook is organised into sections by an editor who has reviewed every chapter in their section and written an introductory preface. In addition, as the lead editor, Samuel Nyman has reviewed every chapter to provide a second peer-review of the content and to bring consistency across all the chapters and sections for the whole handbook.

This handbook has been a large undertaking, with 83 authors from 15 different countries from 5 continents. We would like to thank the authors of all the chapters for their contributions and for striving to make the nuances of their particular research fields accessible to a wider audience. We also thank the authors who all contributed to the glossary and subject index which has been compiled by the lead editor. In addition, we are grateful to Professor Sallis for his foreward and Jane Asher and Professors Rowe and Biddle for their endorsements. Without the combined effort of such a large and multidisciplinary team this handbook would not have been possible.

Dr Samuel R. Nyman, and section co-editors: Dr Anna Barker, Professor Terry Haines, Dr Khim Horton, Dr Charles Musselwhite, Dr Geeske Peeters, Professor Christina Victor, and Dr Julia K. Wolff.

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Terry Haines has a background in physiotherapy and health economics (B.Phty Hons, G. Cert. Health Econ, PhD) and has led a diverse programme of research imbedded in health service provision. He has published over 230 full peer-reviewed publications with high-profile papers in *The Lancet*, *BMJ*, *JAMA Internal Medicine*, and *Journal of Clinical Epidemiology*. He has investigated the use of physical activity interventions in oncology, geriatric, orthopaedic, neurological, critical care, and cardiopulmonary populations.

Khim Horton is an experienced registered nurse with specialist interest in social gerontology (BSc (Hons), PhD). With an interest in the sociology of ageing, Dr Horton's initial study on falls among older people focused on the negotiations and gender issues that older people and their family members have in the prevention of falls. The importance of active and healthy ageing has led Dr Horton, with other EU partners, to coordinate Intensive Programmes on Active and Healthy Ageing involving EU students to participate in summer schools in Slovenia and the Netherlands.

Charles Musselwhite's has research interests in ageing; travel and transport; addressing technological, environmental, health, and sustainability contexts

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Samuel R. Nyman has a background in psychological research (BSc, MSc, PhD). His research interests centre on falls prevention and physical activity promotion among older people and people with dementia. He is currently a National Institute for Health Research Career Development fellow and chief investigator for The TACIT Trial: TAi ChI for people with demenTia.

Geeske Peeters has a background in epidemiology, human movement science, and occupational therapy (BA, MSc, PhD). Her research interests are on the prevention of ageing-related problems such as dementia, falls, and frailty. She received a Global Brain Health Institute Fellowship (2016) to develop strategies to optimize physical and cognitive functioning across the adult lifespan.

Christina R. Victor is a social gerontologist with a background in public health. Her research interests focus upon promoting healthy and active ageing. As such she has an established research programme focusing upon the development and evaluation of interventions to promote physical activity among older adults.

Julia Katharina Wolff is a psychologist who combines developmental and health psychology topics in her research. In her scientific career, she developed an intervention to promote physical activity in old age and worked as deputy head of the German Ageing Survey at the German Centre of Gerontology. The main focus of her research is on health and protective factors for health in older adults including personal resources, such as social support, self-perceptions of ageing, as well as health behaviours, such as physical activity.

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A Multidisciplinary Approach to Promoting Physical Activity Among Older People

Samuel R. Nyman

1.1 Introduction

It has been known since the 1950s that physical activity is linked with physical and mental health benefits for people of all ages (Kohl III et al. 2012). For example, leisure time physical activity is associated with a reduction in risk of 13 types of cancer, regardless of body size or smoking history (Moore et al. 2016). Further, participation in physical activity in mid-life can reduce the risk of poor health in later life, such as developing dementia, disability, and frailty (National Institute for Health and Care Excellence 2015). It seems that older people would like to live for many years in later life on the condition that they live a 'healthy old age', that is, with continued independence (Karppinenm et al. 2016). Thus, physical activity is key to helping people achieve 'healthy ageing' (World Health Organization [WHO] 2015).

However, we also know that many people are not as physically active as they could be, and thus their potential to maximise their health and well-being is not realised. For example, an estimated 9% of worldwide premature mortality is caused by lack of physical activity (Lee et al. 2012). As adults grow older, they are less likely to be physically active, and this decline in physical activity continues so that older people are the least likely to be physically active of all age groups (Hallal et al. 2012; McKee et al. 2015). This is

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why physical activity is a key component of policies aimed at improving the health and well-being of older people, such as 'successful ageing' in the USA and 'active ageing' in Europe. Successful ageing refers to the avoidance of disability and disease to enable continued activity in later life (Foster and Walker 2015). Active ageing, similarly, refers to facilitating older people to remain active—in terms of physical activity, employment, and social, economic, cultural, spiritual, and civic participation—to enable continued quality of life in later life (WHO 2002). While successful and active ageing policies are broader in scope, the focus of this handbook will solely be on physical activity promotion, a central element to any ageing well strategy. In response to current low levels of physical activity participation among older people, this handbook seeks to comprehensively answer the question, 'How can we best promote physical activity among older people?'

1.2 An Outline of the Rationale, Scope, and Contents of the Handbook

This handbook is for researchers, practitioners, postgraduates, and final year undergraduate students. It is to meet the need for a text on the best evidence about how to achieve physical activity promotion among older people. Our handbook meets this need by providing a multidisciplinary text co-edited by a panel of experts from the relevant disciplines. The chapters provide a series of overviews from experts in the field to give the reader an understanding of the current evidence base and associated key theoretical concepts. Each chapter covers what is known about the topic, what is unknown, and the practical implications of current theory and empirical evidence.

1.2.1 The Book's Unique Contribution to the Literature

Despite advances in the fields of gerontology and geriatrics, sports and exercise science, sociology, health psychology, and public health, knowledge is largely contained within disciplines as reflected in the current provision of academic texts on this subject. However, to address the present and substantial societal challenges such as population ageing, a multidisciplinary and collaborative approach is required. This edited volume will review the current evidence for what physical activities need to be promoted among older people and how these physical activities can be implemented to maximise engagement. The unique feature of this handbook is the team of editors and

authors who represent a variety of disciplines and countries that have collaborated to produce for the first time a multidisciplinary handbook on this subject.

1.2.2 Scope of the Book

In accordance with ecological approaches to health promotion, the book will be divided into sections that follow a gradual progression from focusing on determinants of physical activity at the individual level, to the community level, and then finally to the structural level (Dahlgren and Whitehead 1991). The first section of the book will highlight the importance of promoting physical activity among older people from an epidemiological perspective. The second and third sections of the book will focus on the individual level in terms of what physical activities to promote (physiology) and how to maximise participation in physical activity (psychology). The fourth section will focus on the social and community network level (implementation of physical activities in different settings). The fifth and sixth sections will focus on the general socio-economic, cultural, and environmental conditions level in relation to both the physical (landscape and built environment architecture) and social environment (sociology). The final section will provide a discussion of current issues and debates in promoting physical activity among older people. From this handbook, the reader will benefit from the scientific knowledge of the following: why we need to promote physical activity in later life, which activities to promote and how to maximise participation, how the physical, social, and cultural environment facilitates/hinders activity, and future developments in this thriving field.

In the sections that follow, the focus of the handbook is introduced, and in particular, definitions are given for the terms 'physical activity' and 'older people'. An ecological approach is then provided as the framework for the handbook, along with a brief explanation of how this maps on to the handbook's different sections. The chapter then concludes with some applications of the material covered for practitioners working with older people.

1.3 What Do We Mean by Physical Activity?

Terms such as 'physical activity' and 'exercise' are often used interchangeably, but they actually refer to distinct concepts. 'Physical activity refers to body movement that is produced by the contraction of skeletal muscles and that increases energy expenditure' (Chodzko-Zajko et al. 2009, p. 1511).

In contrast, 'exercise refers to planned, structured, and repetitive movement to improve or maintain one or more components of physical fitness' (Chodzko-Zajko et al. 2009, p. 1511), with physical fitness defined as a set of measurable health- or skill-related attributes (Caspersen et al. 1985). Exercise is therefore a subcategory of physical activity and is planned, structured, and repetitive, whereas physical activity can be spontaneous and fluid. Exercise has the express purpose of improving/maintaining physical fitness, whereas physical activity could be conducted with a different intention. For example, someone may walk home because it is a sunny day and to enjoy the weather. They have been walking for 30 minutes, but not for the purpose of getting fit, and they decided to do this spontaneously. Likewise, some physical activities such as playing in the park with grandchildren may be for fun, and while they meet the criteria for physical activity, they would not meet the criteria for exercise.

1.3.1 Rationale for This Handbook's Focus on Physical Activity

While some chapters may focus more on exercise, for example, specific prescribed body movements for the purpose of rehabilitation and to recover strength in a certain area of the body, the handbook has an overall focus on physical activity. Physical activity encompasses a broader range of activity and so has been adopted for this handbook to encompass activities such as sports, activities of moderate intensity, vigorous intensity, muscle training, and lifestyle-based strategies for increasing physical activity. Moderate intensity activities include for example brisk walking, bike riding, dancing, swimming, and active travel (Department of Health, Physical Activity, Health Improvement, & Protection 2011). Vigorous intensity activities include for example running, playing sport, taking part in aerobic exercise classes, and using cardiovascular gym equipment (Department of Health et al. 2011). Muscle strengthening includes for example, weight training, working with resistance bands, carrying heavy loads, heavy gardening, push ups, and sit ups (Department of Health et al. 2011). In contrast to prescriptive exercise, lifestyle-based strategies for increasing physical activity are attempts to incorporate physical activity into people's everyday routines, such as encouraging people to walk to the shops rather than drive and to use the stairs rather than escalators in public buildings (Kerr et al. 2001).

There are different levels by which physical activity and exercise can be described (Chodzko-Zajko et al. 2009). People can carry out physical activity of different types (the activity being undertaken, e.g. brisk walking or

swimming), frequency (how often they do the activity, e.g. weekly), duration (for how long they do the activity, e.g. for 30 minutes), and intensity (how strenuous, e.g. light, moderate, or vigorous). There are also other ways to categorise physical activity, for example, planned vs. unplanned, leisure vs. occupational (Caspersen et al. 1985), and various exercise categories, for example, aerobic exercise training, resistance exercise training, flexibility exercise, and balance training (Chodzko-Zajko et al. 2009).

There is also the issue of fidelity; are people carrying out the activity in the manner prescribed? This is important when a specific exercise intervention is being prescribed and deviation from the programme may either pose a risk to the participant or reduce its benefit. Therefore, fidelity is required when designing programmes to ensure they are congruent with any underlying theory or principles (Keller et al. 2009) and that they are delivered in the way intended (Moore et al. 2015).

1.3.2 Physical Activity Participation as Adherence

There is a debate on which term we should use when we are referring to the extent that an older person is following recommendations (e.g. by national governments) to be physically active, that is, the degree of 'adherence' or 'compliance' (e.g. Kyngäs et al. 2000). In this handbook different terms may be used interchangeably. Furthermore, there is a debate as to how we classify whether or not someone is currently adhering to physical activity recommendations (Hawley-Hague et al. 2016). Despite these debates, the approach taken in this handbook is one that considers older people's participation in physical activity as a voluntary choice and not one imposed upon them. Further, non-adherence or non-participation in physical activity is not perceived as deviant behaviour but can be considered as 'reasoned decision-making' (Donovan and Blake 1992). Both the motivations to be or not to be physically active are important to the study of the promotion of physical activity among older people, and decisions not to be physically active often represent complex situations that cannot be easily reduced to lack of will power (see the ecological approach adopted in this handbook described below). A stance that dictates to older people that they should be physically active and blames people for not being physically active fails to respect both the individual's autonomy and the complex interaction of factors at the individual level, social and community network level, and general socio-economic, cultural, and environmental conditions level (Dahlgren and Whitehead 1991; Michie et al. 2011; WHO 2002). The approach taken in this handbook is not

to dictate to older people what they should do. Rather, this handbook seeks to aid the promotion of physical activity in a variety of ways to make physical activity more useful, convenient, relevant, and fun for older people to enjoy.

1.4 What Do We Mean by Older People?

There are several ways in which we might decide what constitutes an 'older person' (Victor 2006). Chronological age is often used as the criterion by which one is categorised as either 'old' or not. For example, one might deem older people to be aged 65 years or above. While this may seem straightforward, it is however more complex to apply. For example, why should the age be set at 65 and not say 60 or 70? Some researchers have set the bar as low as 50 years of age when including older people (Aalbers et al. 2011; van Stralen et al. 2009). Others argue that people aged in their 60s in say the 1900s and 1950s would have different life expectancies than in current times. Contextually then, in today's age, we might better categorise old age in respect of how many years one might expect to have left, which would be more like 75 years and above for an individual in France up from 58 years in 1900 and 65 years in 1956 (Sanderson and Scherbov 2015). Life expectancy also varies markedly within and between countries. If being 'old' is in relation to how long one has left to live, this will then mean someone could be 'old' much younger in less affluent areas. There are at least two reasons why age has often been set at around 65 years: retirement and illness. In industrialised nations, the age of retirement has been around the age of 65. However, there is no uniform age of retirement across countries, and the custom age to retire differs by professions. Therefore, employment status is not a satisfactory criterion to categorise whether someone is 'old' or not.

In regard to illness, it is undeniable that as we grow older we become more at risk of developing chronic (long-term) illnesses, such as diabetes, arthritis, and heart disease (Hart 1990; Hoffman et al. 1996; Jacobs et al. 2012). Not only that, we are also more at risk of developing more than one chronic illness, that is, comorbidity (Hughes et al. 2013; Marengoni et al. 2009; Sadanand et al. 2013). In later life, this occurs because of senescence, the breakdown of the maintenance function of the body, which is observable in gradual declines of biological and psychological functioning (Seifert et al. 1997; Stuart-Hamilton 1991). From this pattern we might be inclined to suggest that people could be categorised as being older by deterioration in health status, for example, through the development of a debilitating chronic illness or development of comorbidity. However, in taking a lifespan perspective,

from the outset, people's rate of deterioration in health progresses at different rates. By old age, the heterogeneity of health status is far more pronounced than in younger decades and is larger than in any younger generation (Brody et al. 1987; Day 1985; Schaie 1988; Shephard 1997). Simply knowing the age of someone will actually tell you very little about the health status of an individual and vice versa (Ward 1984; WHO 2015).

1.4.1 Is Subjective Age a Viable Alternative?

Given the above unsatisfactory nature of using chronological age as an indicator of whether or not someone is 'old', some have suggested that subjective age is a viable alternative. One's subjective age—their perception of how old they are—is founded and continually moulded through the perceptions of ageing in one's culture and those around them (Settersten Jr. and Hagestad 2015). Part of the credence for using perceived age is that it is a better predictor than chronological age of an older person's health, independence, engagement in social activities, self-efficacy, and quality of life (Bowling et al. 2005). It appears that most adults perceive themselves to be younger than their chronological age, which is predictive of a slower decline in cognitive functioning (Stephan et al. 2016). Further, one's perceived age appears to be based on social comparisons and one feels younger if they have better functioning on age-relevant domains such as health and memory than their peers (Hughes and Lachman 2016).

However, this subjective approach will be difficult for some to accept who would much rather prefer more objective means of categorising if someone is old or not (e.g. by chronological age). Furthermore, subjective age is domain specific. For example, someone may feel physically younger than their chronological age, but older in terms of their social relationships (e.g. because of early grandparenthood). Also, information on someone's perceived age will not be readily available and will likely change with time and circumstances, and so one will not be able to fathom an individual's subjective age unless they use some form of validated questioning to obtain this information. One can foresee that this process and continual need for updating will be impractical and pose ethical dilemmas in circumstances where services are to be provided or not to people by age category.