University of Groningen

Physical activity and cardiometabolic health

Byambasukh, Oyuntugs

DOI:
[10.33612/diss.112903501](https://doi.org/10.33612/diss.112903501)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2020

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):
Byambasukh, O. (2020). *Physical activity and cardiometabolic health: Focus on domain-specific associations of physical activity over the life course*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen. <https://doi.org/10.33612/diss.112903501>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

PHYSICAL ACTIVITY AND CARDIOMETABOLIC HEALTH

Focus on domain-specific associations of physical activity over the life course

The work was funded by Mongolian State Training Fund and Groningen University Institute for Drug Exploration (GUIDE), Graduate School of Medical Sciences. The printing of this thesis was financially supported by the University of Groningen, University Medical Center Groningen, GUIDE, and the Netherlands Association for the Study of Obesity.

The author gratefully acknowledges the financial support for printing of this thesis by: Centre for East Asian Studies Groningen (CEASG) and Monfa Trade Co., Ltd.

PHYSICAL ACTIVITY AND CARDIOMETABOLIC HEALTH

Focus on domain-specific associations of physical activity over the life course
Thesis, University of Groningen, the Netherlands

Author: Oyuntugs Byambasukh
Lay-out: Batbold Boldbaatar
Printing: Ridderprint BV – www.ridderprint.nl
ISBN: 978-94-034-2407-1 (ebook)
978-94-034-2406-4 (printed)

Copyright © Oyuntugs Byambasukh, Groningen 2020.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means mechanically, by photocopying, recording or otherwise, without the written permission of the author.

university of
 groningen

Physical activity and cardiometabolic health

Focus on domain-specific associations of physical activity over
the life course

PhD thesis

to obtain the degree of PhD at the
University of Groningen
on the authority of the
Rector Magnificus Prof. C. Wijmenga
and in accordance with
the decision by the College of Deans.

This thesis will be defended in public on
Monday 17 February 2020 at 12.45 hours

by

Oyuntugs Byambasukh

born on 8 January 1984
in Ulaanbaatar, Mongolia

Supervisors

Dr. ir. E. Corpeleijn

Prof. S.J.L. Bakker

Assessment Committee

Prof. R. Dekker

Prof. U. Bultmann

Prof. M. Visser

Paranymphs

E.B.Lamé
P.C.Vinke

For my parents
(Хайрт аав, ээждээ)

CONTENTS

Chapter 1	General introduction	9
Chapter 2	Physical activity, fatty liver, and glucose metabolism over the life course: The Lifelines Cohort <i>American Journal of Gastroenterology. 2019;114(6):907-915.</i>	23
Chapter 3	The relation between leisure time, commuting and occupational physical activity with blood pressure in 125,402 adults: The Lifelines cohort <i>Journal of The American Heart Association 2019;8:e014313</i>	49
Chapter 4	Physical activity and 4-year changes in body weight in 52,498 non-obese people: the Lifelines cohort <i>Under review</i>	75
Chapter 5	Physical activity and the development of post-transplant diabetes and cardiovascular and all-cause mortality in renal transplant recipients <i>Under review</i>	101
Chapter 6	Body Fat Estimates from Bioelectrical Impedance Equations in Cardiovascular Risk Assessment: the PREVEND Cohort Study. <i>European Journal of Preventive Cardiology. 2019;26(9):905-916.</i>	123
Chapter 7	The Lifelines physical activity score: revising data processing of the SQUASH questionnaire	155
Chapter 8	General discussion and conclusions	181
Chapter 9	Summary	201
	Nederlandse samenvatting	207
	Mongolian-language summary	211
	Acknowledgements	215
	About the author	221
	Abbreviations	224