The use of measures of obesity in childhood for predicting obesity and the development of obesity-related diseases in adulthood: a systematic review and meta-analysis

Mark Simmonds,¹ Jane Burch,¹ Alexis Llewellyn,¹ Claire Griffiths,² Huiqin Yang,¹ Christopher Owen,³ Steven Duffy¹ and Nerys Woolacott¹*

¹Centre for Reviews and Dissemination, University of York, York, UK
²School of Sport, Leeds Metropolitan University, Leeds, UK
³Division of Population Health Sciences and Education, St George’s, University of London, London, UK

*Corresponding author

Declared competing interests of authors: none

Published June 2015
DOI: 10.3310/hta19430

Plain English summary

Predicting obesity and development of obesity-related diseases in adulthood

Health Technology Assessment 2015; Vol. 19: No. 43
DOI: 10.3310/hta19430

NIHR Journals Library www.journalslibrary.nihr.ac.uk
Plain English summary

Obesity in adults increases the risk of health problems such as diabetes, heart disease and cancer. It is unclear whether or not being obese as a child is also linked to these adult diseases. It is also unclear if body mass index (BMI) is the best way of assessing whether or not a child is a healthy weight.

Our research investigated how useful it is to assess whether or not a child is obese. We also investigated if there was any evidence that using other measures, such as waist-to-hip ratio or waist circumference, might be better than BMI. We also assessed how accurate BMI and other measures are in children.

We performed systematically conducted reviews of the medical literature to find all the best research evidence to address these questions.

Our research found that obesity frequently persists from childhood to adulthood and that BMI is a reasonably accurate measure of obesity in children, which can help identify children who are likely to be obese in adulthood and who may benefit from losing weight. However, it does not identify the many healthy-weight children who will become obese or develop obesity-related diseases in adulthood. Most obesity-related diseases occur in adults who were of healthy weight in childhood.

There is a lack of evidence to help determine whether or not any other measure is better or worse than BMI for assessing childhood weight status. Children, parents and nurses found BMI was generally acceptable and easy to use.
Criteria for inclusion in the Health Technology Assessment journal

Reports are published in Health Technology Assessment (HTA) if (1) they have resulted from work for the HTA programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

Reviews in Health Technology Assessment are termed ‘systematic’ when the account of the search appraisal and synthesis methods (to minimise biases and random errors) would, in theory, permit the replication of the review by others.

HTA programme

The HTA programme, part of the National Institute for Health Research (NIHR), was set up in 1993. It produces high-quality research information on the effectiveness, costs and broader impact of health technologies for those who use, manage and provide care in the NHS. ‘Health technologies’ are broadly defined as all interventions used to promote health, prevent and treat disease, and improve rehabilitation and long-term care.

The journal is indexed in NHS Evidence via its abstracts included in MEDLINE and its Technology Assessment Reports inform National Institute for Health and Care Excellence (NICE) guidance. HTA research is also an important source of evidence for National Screening Committee (NSC) policy decisions.

For more information about the HTA programme please visit the website: http://www.nets.nihr.ac.uk/programmes/hta

This report

The research reported in this issue of the journal was funded by the HTA programme as project number 12/80/01. The contractual start date was in September 2013. The draft report began editorial review in February 2014 and was accepted for publication in June 2014. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HTA editors and publisher have tried to ensure the accuracy of the authors’ report and would like to thank the reviewers for their constructive comments on the draft document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, NETSCC, the HTA programme or the Department of Health. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the HTA programme or the Department of Health.

© Queen’s Printer and Controller of HMSO 2015. This work was produced by Simmonds et al. under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Published by the NIHR Journals Library (www.journalslibrary.nihr.ac.uk), produced by Prepress Projects Ltd, Perth, Scotland (www.prepress-projects.co.uk).
Editor-in-Chief of *Health Technology Assessment* and NIHR Journals Library

**Professor Tom Walley**  Director, NIHR Evaluation, Trials and Studies and Director of the HTA Programme, UK

NIHR Journals Library Editors

**Professor Ken Stein**  Chair of HTA Editorial Board and Professor of Public Health, University of Exeter Medical School, UK

**Professor Andree Le May**  Chair of NIHR Journals Library Editorial Group (EME, HS&DR, PGfAR, PHR journals)

**Dr Martin Ashton-Key**  Consultant in Public Health Medicine/Consultant Advisor, NETSCC, UK

**Professor Matthias Beck**  Chair in Public Sector Management and Subject Leader (Management Group), Queen’s University Management School, Queen’s University Belfast, UK

**Professor Aileen Clarke**  Professor of Public Health and Health Services Research, Warwick Medical School, University of Warwick, UK

**Dr Tessa Crilly**  Director, Crystal Blue Consulting Ltd, UK

**Dr Peter Davidson**  Director of NETSCC, HTA, UK

**Ms Tara Lamont**  Scientific Advisor, NETSCC, UK

**Professor Elaine McColl**  Director, Newcastle Clinical Trials Unit, Institute of Health and Society, Newcastle University, UK

**Professor William McGuire**  Professor of Child Health, Hull York Medical School, University of York, UK

**Professor Geoffrey Meads**  Professor of Health Sciences Research, Faculty of Education, University of Winchester, UK

**Professor John Powell**  Consultant Clinical Adviser, National Institute for Health and Care Excellence (NICE), UK

**Professor James Raftery**  Professor of Health Technology Assessment, Wessex Institute, Faculty of Medicine, University of Southampton, UK

**Dr Rob Riemsma**  Reviews Manager, Kleijnen Systematic Reviews Ltd, UK

**Professor Helen Roberts**  Professor of Child Health Research, UCL Institute of Child Health, UK

**Professor Helen Snooks**  Professor of Health Services Research, Institute of Life Science, College of Medicine, Swansea University, UK

Please visit the website for a list of members of the NIHR Journals Library Board:
www.journalslibrary.nihr.ac.uk/about/editors

**Editorial contact:** nihredit@southampton.ac.uk