NUTRITION AND PHYSICAL ACTIVITY FOR PRE-SCHOOLERS: EARLY CHILDHOOD EDUCATION TEACHERS' KNOWLEDGE AND PERSPECTIVES

A thesis presented in partial fulfilment of the requirements for the degree of

Masters of Science

In

Nutrition and Dietetics

Massey University, Albany

New Zealand

Jeanette Rapson

2017

ABSTRACT

Background Caregivers' knowledge of the links between nutrition, diet and physical activity is increasingly being recognised as important for children's health and body size. Evidence is limited for early childhood education (ECE) teachers' knowledge about nutrition and physical activity for pre-schoolers, especially in New Zealand. Identifying knowledge gaps amongst teachers may direct professional development, health promotion and obesity prevention strategies in childcare settings.

Aims The primary aim was to measure early childhood education (ECE) teachers' nutrition knowledge for pre-schoolers (2-5-year-olds); and their perspectives towards nutrition and physical activity. In order to achieve this, a secondary aim was to design an ECE teacher nutrition knowledge questionnaire that satisfies psychometric criteria of validity and reliability.

Methods Questionnaire items were generated based on New Zealand Ministry of Health nutrition guidelines for pre-schoolers, a literature search and expert advice. Nutrition (n=40) and non-nutrition (n=51) university students completed the questionnaire once; 35 of the nutrition students completed the questionnaire twice.

Psychometric tests for construct and test-retest reliability were conducted. The cross-sectional online validated questionnaire of New Zealand ECE teachers' nutrition knowledge for pre-schoolers was then used to measure ECE teachers' nutrition knowledge for pre-schoolers. Knowledge was scored and measured against the Ministry of Health *Food and Nutrition Guidelines for Healthy Children and Young People (Aged 2-18 years): A background paper* (2015c). Teachers' perspectives towards nutrition and physical activity for pre-schoolers were assessed using Likert scales within the questionnaire. Analysis included descriptive statistics, correlation and linear regression.

Results The questionnaire achieved an acceptable level of content and construct validity and test-retest reliability. ECE teachers (n=386) from New Zealand childcare centres

completed the validated questionnaire. Teachers' knowledge of nutrition was lacking; overall score was 22.56 ± 2.83 (mean ± SD), or 61% correct. Age, qualification level, employment role and years of experience did not predict overall nutrition knowledge scores. Teachers' increased years of experience significantly predicted an increase in knowing that New Zealand nutrition and physical activity guidelines existed (B=0.02 [95% CI, 0.00-0.03], r^2=0.13, P=0.033). Teachers' increased agreement in feeling they were confident talking about nutrition to parents significantly predicted an increase in overall nutrition knowledge scores, (B=0.34 [95% CI, 0.06-0.63], r^2=0.15, P=0.019). The belief that ECE teachers play a vital role in promoting pre-schoolers' healthy eating and physical activity was widespread. Teachers generally held positive perspectives towards feeding practices and perceived themselves to understand key physical activity concepts. Common barriers for ECE teachers' nutrition and physical activity knowledge included a lack of staff training, confidence and resources.

Conclusion The questionnaire achieved an acceptable level of construct validity and test-retest reliability and is suitable to measure ECE teachers' nutrition knowledge for pre-schoolers (2-5-year-olds) in New Zealand. ECE teachers may lack nutrition knowledge for pre-schoolers in New Zealand, particularly with regards to basic nutrition recommendations (servings, food/beverage choices and portion sizes).

Keywords: childhood obesity, childcare, kindergarten, day care, pre-school, nutrition environment, psychometric validation, nutrition literacy

ACKNOWLEDGEMENTS

I must express my greatest appreciation to everyone who made this research possible. Firstly, I would like to thank all childcare staff who volunteered their time to participate in this research and for completing the study questionnaire in a timely and thorough manner. A special thanks to BestStart and the Heart Foundation for their support and for distributing the questionnaire to their networks.

My deepest gratitude to my two supervisors Cathryn Conlon and Ajmol Ali, who guided me with their extensive expertise: your knowledge and experience in research, statistical analysis, liaising with key stakeholders and the media and interpretation/presentation of study results was invaluable. Thank you for investing your time and being a great inspiration to me. Pamela von Hurst, thank you for your assistance with validating the questionnaire. Thank you Kathryn Beck for also helping with the questionnaire validation, as well as sharing your wide expertise in statistical analyses. Daniel Gordon, your assistance with Qualtrics was invaluable. Thank you Owen Mugridge for supporting the research process. Thank you to Massey University and the Ethics committee, I am privileged and pleased to be able to present this thesis with your support.

I was overwhelmed by the support and interest from childcare centres, the public and media during the recruitment phase. Thank you Jenna Ward and Genevieve Westcott for liaising with the press and managing the study's press release. Special thanks to *RadioLive* and *News Talk ZB* for inviting me to talk about this study on your radio shows and *The North Shore Times* for publishing articles on this study.

To my family: Mum, Dad, Gran, Gareth, Vicki and Willow. It is difficult to put into words the sincere gratitude I have for you. You have supported me emotionally and financially throughout my studies and helped me face some enormous life challenges that presented themselves along the way. Your interest, feedback and advice throughout this research was invaluable. You have believed in me and given me unconditional love throughout my whole life and most of all you have been my best friends and confidants. Thank you to all my friends who have stood by me no matter what. I have an extremely blessed and fulfilled life because of you all.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND SYMBOLS

Table I. List of abbreviations and symbols

Abbreviation or symbol	Definition
%	Percentage
<	Less than
=	Equal to
>	Greater than
±	Plus-minus
≤	Equal to or Less than
≥	Equal to or Greater than
ANOVA	Analysis of variance
AUS	Australia
BMI	Body mass index
CACFP	Child and Adult Care Food Program
CDC	Centers for Disease Control and Prevention
CI	Confidence Interval (i.e. Upper and Lower Bounds)
cont.	Continued
d	Cohen's effect size index
df	Degrees of freedom
Dr	Doctor
e.g.	Example
ECE	Early childhood education
et al.	and others
F	F-ratio
HHA	Healthy Heart Award
IBM	International Business Machines Corporation
kg	Kilogram
MEDLINE	Medical Literature Analysis and Retrieval System Online

MeSH	Medical Subject Headings
METs	Metabolic equivalents
mg	Milligram
MoH	Ministry of Health
MS	Mean squares
MSc	Master of Science
MVPA	Moderate-vigorous intensity physical activity
N	Population size
n	Sample size
NAP SACC	Nutrition and Physical Activity Self-Assessment for Child Care
NK	Nutrition knowledge
NSW	New South Wales
NZ	New Zealand
OECD	Organisation for Economic Co-operation and Development
PAHA	Physical Activity Health Alliance
PAK	Physical activity knowledge
PubMed	Public/Publisher MEDLINE
P-value	The probability of rejecting the null hypothesis when it is true
r	Pearson's product-moment correlation coefficient
r^2	Coefficient of determination (r-squared)
RCT	Randomised control trial
RDA	Recommended daily allowance
RDI	Recommended daily intake
r_s	Spearman's correlation coefficient
SD	Standard deviation
SPANS	Schools Physical Activity and Nutrition Survey
SPSS	Statistical Package for the Social Sciences
U	Mann-Whitney U (Wilcoxon) statistic
UK	United Kingdom
US or USA	United States of America

USDA	United States Department of Agriculture
VPA	Vigorous intensity physical activity
WHO	World Health Organization
y	Years
z	Standard score
zBMI	Body mass index-for-age z-score (or standard deviation score)
β	Greek Beta (the probability of a Type II error)