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Investigating eating behaviours as predictors of body composition and dietary intake in New Zealand European, Māori and Pacific women – the women's EXPLORE study.

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Abstract

Background/Aim: Internationally, eating behaviour has been linked with an optimal and adverse body composition in women. However no study to date has examined eating behaviour in female New Zealand ethnic groups. Therefore, the aim of this study was to investigate eating behaviours as predictors of different body composition factors and dietary intake in New Zealand European (NZE), Māori and Pacific women, aged 16-45 years, participating in the women's EXPLORE study.

Methods: Women (N=368) were assessed for basic anthropometry, total adiposity, regional adipose distribution and lean mass using height, weight, circumferences, dual x-ray absorptiometry and air-displacement plethysmography. Body composition profiles (normal-fat, hidden-fat and apparent-fat) were established using parameters of body mass indices and body fat percentages. The validated Three-Factor Eating Questionnaire (TFEQ) and New Zealand Women's Food Frequency Questionnaire were both used to examine eating behaviour and dietary intake, respectively. The TFEQ examined Restraint (Flexible and Rigid), Disinhibition (Habitual, Emotional and Situational) and Hunger (Internal and External). Combinations of behaviour (sub-groups) were established from the main categories and also examined.

Results: Restraint was significantly higher in NZE than Pacific women ($p = 0.015$). Disinhibition) was significantly higher in the apparent-fat profile than normal-fat profile ($p < 0.001$). Likewise, Hunger was significantly higher in Pacific ($p < 0.001$) and the apparent-fat profile ($p = 0.034$) than NZE women and women with normal-fat profile, respectively. Adverse tendencies of Habitual Disinhibition, and External Hunger were more prominent in Pacific and the apparent-fat profile than NZE women and normal-fat profile, respectively (all $p < 0.05$). External Hunger was more prominent in the hidden-fat profile than normal-fat profile ($p = 0.001$). When accounting for age and ethnicity the most significant predictors of BMI and BF % were Restraint ($p = 0.007$ and $p = 0.005$ respectively), Disinhibition (both $p < 0.001$), Habitual Disinhibition (both $p < 0.001$) and Emotional Disinhibition (both $p < 0.001$). Non-ideal behaviour combinations (Low Restraint High Disinhibition and High Hunger High Disinhibition) generally corresponded to significantly higher body composition markers and dietary intake ($p < 0.05$). Pacific women were three times more likely to have High Hunger High Disinhibition than NZE women ($p = 0.004$). Low Restraint High Disinhibition and High Hunger High Disinhibition increased by 12% and 11%, respectively from the normal-fat profile to hidden-fat profile (both $p < 0.001$).

Conclusions: The TFEQ eating behaviour categories, sub-categories and sub-groups can significantly vary between ethnicities and body composition groups. Tailored interventions to promote Restraint

(particularly Flexible Restraint) and counteract Disinhibition (particularly Habitual Disinhibition and Emotional Disinhibition), Hunger (particularly External Hunger), Low Restraint High Disinhibition and High Hunger High Disinhibition could enhance eating behaviour and dietary intake and help optimise weight management in young New Zealand women.

Key words: *Eating behaviour, body composition profiles, New Zealand women*

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Table of Contents

Abstract 1

Acknowledgements 3

List of Tables 6

List of Figures 7

List of Appendices 7

List of Abbreviations 7

Chapter 1 10

Introduction 10

1.1 Background 10

1.2 Justification and statement of the research problem 12

1.3 Purpose of the research study 14

1.3.1 Aim 15

1.3.2 Objectives 15

1.3.3 Hypothesis 15

1.4 Structure of the thesis 16

1.5 Researchers contribution 17

Chapter 2 18

Literature review 18

2.1 Obesity 18

2.2 Measuring body composition 21

2.3 Measuring eating behaviour 29

2.4 The relationship between eating behaviour, body composition, dietary intake and ethnicity 36

2.4.1 Restraint 38

2.4.2 Disinhibition 41

2.4.3 Hunger 46

2.4.4 Sub-groups of Restraint, Disinhibition and Hunger 49

2.5 Conclusion 50

Chapter 3 52

Research Study Manuscript 52

Abstract 52

3.1 Introduction 53

3.2 Materials and methods 54

3.2.1 EXPLORE Study design 54

3.2.2 Study participants and screening procedures 54

3.2.3 Measures 55
3.2.4 Statistical analysis 58
3.3 Results 59
3.3.1 Participant characteristics in relation to ethnicity and BCP 59
3.3.2 TFEQ categories and sub-categories influence on body mass index and body fat percentage 65
3.3.3 Sub-groups of Restraint and Disinhibition 68
3.3.4 Sub-groups of Hunger and Disinhibition 70
3.4 Discussion 74
3.4.1 Restraint 74
3.4.2 Disinhibition 76
3.4.3 Hunger 78
3.4.4 Sub-groups of Restraint and Disinhibition 80
3.4.5 Sub-groups of Hunger and Disinhibition 80
3.4.6 Recommendations, strengths and weaknesses 81
3.5 Conclusion 82
Chapter 4 83
Conclusions and Recommendations 83
4.1 Overview 83
4.2 Aims and objectives 83
4.3 Strengths and weaknesses of the study 88
4.4 Recommendations 89
4.4.1 Recommendations for improving eating behaviour 89
4.4.2 Recommendations for future research 91
References 93
Appendix 103

List of Tables

Table 1.1 Researcher's contributions to the thesis 17

Table 2.1 Body mass index categories and the associated risks of morbidity (World Health Organisation, 2017)..... 18
Table 2.2 The prevalence of overweight and obesity in New Zealand women, in relation to age and ethnicities (Ministry of Health, 2018a). 20
Table 2.3 The purpose, strengths and weaknesses of laboratory-based body composition assessments (Lee and Nieman, 2007, Gibson, 2005)..... 22
Table 2.4 The purpose, strengths and weaknesses of manual anthropometric assessment methods of body composition (Gibson, 2005, Lee and Nieman, 2007). 25
Table 2.5 Body fat percentage categories, for women > 18 years, in relation to health (Shuster et al., 2012). 27
Table 2.6 Body composition profiles and their associated body mass indices and body fat percentages (Kruger et al., 2015). 28
Table 2.7 Metabolic biomarkers and measurements, across different body composition profiles, in young women (Oliveros et al., 2014). 28
Table 2.8 Dietary behaviour assessment methods used in epidemiological studies (Hunot et al., 2016, Framson et al., 2009, Clementi et al., 2017, James et al., 2017, Schembre et al., 2009, Schembre and Geller, 2011, Kliemann et al., 2016, Van Strein et al., 1986, Gormally et al., 1982, Herman and Mack, 1975, Pudel et al., 1975)..... 30
Table 2.9 A summary of the Three Factor Eating Questionnaire categories and sub-categories (Bond et al., 2001, Westenhoefer, 1991). 34
Table 2.10 Studies investigating the relationship between Restraint and body composition in normal weight, overweight and obese adults. 39
Table 2.11 Studies investigating the relationship between Disinhibition and body composition in normal weight, overweight and obese adults. 42
Table 2.12 Studies investigating the relationship between Hunger and body composition in normal weight, overweight and obese adults..... 47

Table 3.1 Participant characteristics in terms of demographic, anthropometric and body composition data. 60
Table 3.2 Participant characteristics in terms of dietary intake and TFEQ scores. 63
Table 3.3 Linear regression for Three Factor Eating Questionnaire main categories correlation to body mass index and body fat percentage. 65
Table 3.4 Linear regression for Three Factor Eating Questionnaire sub-categories correlation to body mass index and body fat percentage. 66
Table 3.5 Sub-groups of Restraint and Disinhibition in relation to participant characteristics. 69
Table 3.6 Sub-groups of Hunger and Disinhibition in relation to participant characteristics. 73

Table 4.1 Recommendations for improving eating behaviour in relation to ethnicity and body composition profiles 90

List of Figures

Figure 2.1 Potential complications and diseases associated with increased adiposity (Rochester Medical Weight Loss Center, 2018). 19

Figure 3.1 Flow diagram of the EXPLORE sub-study participants, procedures and measures..... 57
Figure 3.2 Sub-groups of Restraint and Disinhibition in relation to body composition profiles. 68
Figure 3.3 Sub-groups of Hunger and Disinhibition in relation to ethnicity..... 71
Figure 3.4 Sub-groups of Hunger and Disinhibition in relation to body composition profiles..... 72

List of Appendices

Appendix A. Participant personal health, demographics and screening questionnaire 103
Appendix B. New Zealand Women's Food Frequency Questionnaire 107
Appendix C. Three Factor Eating Questionnaire 137
Appendix D Correlations between air displacement plethysmography and dual x-ray absorptiometry for fat mass and body mass percentage 146
Appendix E Scatter plot of air displacement plethysmography and dual x-ray absorptiometry fat mass for women with a normal body mass index, in relation to ethnicity. 146
Appendix F Scatter plot of air displacement plethysmography and dual x-ray absorptiometry fat mass for women with a high body mass index, in relation to ethnicity. 147
Appendix G Scatter plot of air displacement plethysmography and dual x-ray absorptiometry body fat percentage for women with a normal body mass index, in relation to ethnicity. 148
Appendix H Scatter plot of air displacement plethysmography and dual x-ray absorptiometry body fat percentage for women with a high body mass index, in relation to ethnicity..... 149
Appendix I Linear Regression for Three Factor Eating Questionnaire main categories correlation to body mass index and body fat percentage 149
Appendix J Linear Regression for Three Factor Eating Questionnaire sub-categories correlation to body mass index and body fat percentage 151
Appendix K.1 Sub-groups of Restraint and Disinhibition in relation to ethnicity 153
Appendix L.2 Sub-groups of Restraint and Disinhibition in relation to demographic information ... 153
Appendix M Sub-groups of Hunger and Disinhibition in relation to demographic information 154

List of Abbreviations

ADP	Air displacement plethysmography
AEBQ	Adult Eating Behaviour Questionnaire
AT	Adipose tissue

BCP	Body composition profile
BD	Body density
BF	Body fat
BF %	Body fat percentage
BIA	Bioelectrical impedance analysis
BMD	Bone mineral density
BMI	Body mass index
BV	Body volume
CT	Computerised tomography
DEBQ	Dutch Eating Behaviour Questionnaire
DXA	Dual x-ray absorptiometry
EAT	Eating Attitude Test
EDI	Eating Disorder Inventory
EXPLORE	Examining Predictors Linking Obesity Related Elements
FFM	Fat-free mass
FFQ	Food Frequency Questionnaire
FPS	Food Pleasure Scale
G	Gram
HC	Hip circumference
HDL-C	High density lipoprotein cholesterol
IES	Intuitive Eating Scale
IL-6	Inflammatory marker 6
KG	Kilogram
LBM	Lean body mass
LDL-C	Low density lipoprotein cholesterol
M	Metre
MEQ	Mindful Eating Questionnaire
Mrem	Millirem
MRI	Magnetic resonance imagine
N	Number
NZ	New Zealand

NZE	New Zealand European
NZWFFQ	New Zealand Women's Food Frequency Questionnaire
OGTT	Oral glucose tolerance test
PET	Positron emission tomography
PSS	Perceived Stress Scale
rEI	Reported energy intake
RMR	Resting metabolic rate
SAT	Sub-cutaneous adipose tissue
SEIC	Satter Eating Competency Inventory
SREBQ	Self-Regulation Eating Behaviour Questionnaire
STAI	State Trait Anxiety Inventory
TAC	Tissue time activity curves
TBW	Total body water
TEE	Total energy expenditure
TEF	Thermic effect of food
TFEQ	Three Factor Eating Questionnaire
VAS	Visual Analogue Scale
WC	Waist circumference
WHR	Waist to hip ratio
WREQ	Weight Related Eating Questionnaire
WTHR	Waist to height ratio
YFAS	Yale Food Addiction Scale