UNIVERSITI PUTRA MALAYSIA

EFFECTIVENESS OF SOCIAL MEDIA AND FACE-TO-FACE FAMILY-BASED INTERVENTION IN IMPROVING ADIPOSITY AMONG MALAY SCHOOL CHILDREN IN BANGI, SELANGOR, MALAYSIA

NORLIZA BINTI AHMAD

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By

NORLIZA BINTI AHMAD

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the Degree of Doctor of Philosophy

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NORLIZA BINTI AHMAD

May 2017

Chairman : Professor Lye Munn Sann, DrPH
Faculty : Medicine and Health Science

Background: Childhood obesity causes short- and long-term health problems and its increasing prevalence demands urgent public health action. Parents can play an important role in combating childhood obesity and social media may be an effective way of delivering family interventions.

Objective: To develop, implement and evaluate the effectiveness of a family intervention based on REDUCE (REorganising Diet, Uncontrolled sCreen time and Exercise) delivered face- to-face and via social media, aimed at improving child adiposity that include BMI z-scores (primary outcome), waist circumference percentile (secondary outcome), and percentage body fat (secondary outcome) and intervening variables: i) parental factors (knowledge about nutrition, physical activity and obesity-related diseases; healthy lifestyle practices; authoritative feeding style; self-efficacy); ii) child factors (eating behaviour; consumption of sugar-sweetened beverages, fruit and vegetables, and unhealthy snacks; physical activity; screen time).

Methodology: A two-arm, double-blind, randomised controlled field trial, involving parent-child dyads from five schools in Bangi, Selangor. Parents were eligible if (a) their children were aged between seven and ten years at recruitment, with BMI z-scores at least +1*SD* and (b) they were computer literate, had access to the Internet and were willing to use social media. Parents were excluded if their children had a chronic medical illness, physical or learning disabilities. All eligible parent-child dyads (134 parent-child dyads) were randomly allocated to intervention group (67 parent-child dyads) or the wait-list control group (67 parent-child dyads). The REDUCE intervention programme was based on social cognitive theory and was delivered in two phases. Phase one was a four-week training programme consisting of two face-to-face sessions

and two Facebook contacts; phase two consisted of weekly boosters delivered via WhatsApp over a three-month period. Factor analysis and reliability of the questionnaire were conducted before collection of data. Data consisted of validated self-administered parental questionnaires, three-day food records and measurements of children's height, weight and percentage body fat at baseline, immediately post-training, and at three- and six-months post-training. Data were analysed using generalised linear mixed models with covariates (child's age, child's gender, parents' BMIs, parents' education, family income, and baseline measurements), implemented in SPSS version 22. The level of significance was set at alpha = 0.05. Subgroup analyses were performed for overweight and obese children. Results are presented for the whole sample and for subgroups of overweight and obese children.

Results: The response rate was 91%. At the six-month post-training, the intervention group had significantly reduced BMI z-scores compared to the wait-list group for the whole sample ($F(6, 517) = 2.817$, $p = 0.008$) and obese subgroup ($F(6, 297) = 6.072$, $p < 0.001$). Waist circumference percentile was significantly reduced in the intervention group compared to the wait-list group for obese subgroup ($F(6, 297) = 3.998$, $p = 0.001$). The percentage of total body fat was significantly reduced compared to the wait-list group ($F(6, 201) = 2.526$, $p = 0.022$) for overweight subgroup. There were also significant differences between the intervention and control groups with respect to parental and child factors. The intervention group showed an increase in total parental knowledge score (whole sample; obese subgroup; overweight subgroup), improvements in dietary practice (whole sample; obese subgroup), improvements in physical activity practices (whole sample; obese subgroup), increased self-efficacy with respect to their child's physical activity (whole sample; overweight subgroup) and a more authoritative parenting style (overweight subgroup). With respect to child factors the intervention group showed decreased enjoyment of food (whole sample; obese subgroup; overweight subgroup) and increased fruit and vegetable intake (whole sample; obese subgroup).

Conclusion: The four-month REDUCE intervention programme, which was delivered face-to-face and via social media, was effective in reducing children's adiposity for both overweight and obese subgroups and improving some of the parental factors and child factors associated with excess weight. These results suggest that the REDUCE intervention programme can be incorporated into child obesity prevention programmes delivered by primary health care centres.

Keywords: Childhood obesity, family-based intervention, social media, randomised controlled trial, BMI z-score.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

KEBERKESANAN INTERVENSI KELUARGA MENGGUNAKAN MEDIA SOSIAL DAN BERSEMUKA DALAM MENAMBAHBAIK ADIPOSITI KANAK-KANAK MELAYU YANG BERSEKOLAH DI BANGI, SELANGOR, MALAYSIA

Oleh

NORLIZA BINTI AHMAD

Mei 2017

Pengerusi : Profesor Lye Munn Sann, DrPH
Fakulti : Perubatan dan Sains Kesihatan

Latarbelakang: Obesiti dalam kalangan kanak-kanak boleh mengakibatkan komplikasi jangkamasa pendek dan panjang. Ibubapa boleh memainkan peranan dalam memerangi obesiti kanak-kanak dan media sosial mungkin merupakan kaedah yang berkesan dalam menyampaikan intervensi keluarga.

Objektif: Untuk membangun, melaksana dan menilai keberkesanan program intervensi keluarga yang berasaskan REDUCE (penyusunan semula diet, masa skrin yang tak terkawal dan senaman) yang disampaikan secara bersemuka dan melalui media sosial yang bertujuan untuk menambahbaik adipositi kanak-kanak termasuk indeks jisim badan (IJB) z-skor (hasilan utama), persentil lilitan pinggang (hasilan kedua), dan peratusan jumlah lemak badan (hasilan kedua) serta faktor perantara: i) faktor ibubapa (pengetahuan mengenai pemakanan, aktiviti fizikal dan penyakit yang berkaitan dengan kegemukan; amalan gayahidup sihat; gaya memberi makan yang autoritatif; efikasi-kendiri), ii) faktor kanak-kanak (tingkahlaku pemakanan; pengambilan minuman manis, buah-buahan dan sayur-sayuran, dan snek tidak sihat; aktiviti fizikal; masa skrin).

Metodologi: Percubaan lapangan rawak terkawal, rabun dua pihak, dua kumpulan yang melibatkan pasangan ibubapa dan kanak-kanak sekolah dari lima buah sekolah di Bangi, Selangor. Ibubapa adalah layak jika (a) anak mereka berusia di antara tujuh dan sepuluh tahun semasa perekrutan dengan IJB z-skor +1SD atau lebih dan (b) celik komputer, mempunyai akses kepada internet dan bersedia menggunakan media sosial. Ibubapa dikecualikan jika mereka melaporkan anak mereka menghidapi penyakit perubatan kronik, atau ketidakupayaan fizikal atau masalah pembelajaran. Semua

pasangan ibubapa-anak (134 pasangan ibubapa-anak) yang layak diperuntukkan secara rawak ke dalam kumpulan intervensi (67 pasangan ibubapa-anak) atau kawalan (67 pasangan ibubapa-anak). Program intervensi REDUCE adalah berasaskan kepada teori sosial kognitif dan disampaikan dalam dua fasa. Fasa satu ialah latihan empat minggu yang terdiri dari dua sesi secara bersemuka dan dua sesi melalui Facebook; fasa kedua terdiri dari booster mingguan melalui WhatsApp selama tiga bulan. Analisis faktor dan reliabiliti borang soal selidik telah dijalankan sebelum pengumpulan data. Data terdiri dari borang soal selidik yang telah divalidasi dan rekod pemakanan yang diisi oleh ibubapa serta pengukuran kanak-kanak iaitu tinggi, berat dan peratusan jumlah lemak badan yang dilakukan pada peringkat permulaan kajian, sejurus selepas latihan dan bulan ke-tiga dan bulan ke-enam selepas latihan. Data dianalisa menggunakan *generalised linear mixed model* dengan kovariat (umur kanak-kanak, jantina kanak-kanak, IJB ibubapa, tahap pendidikan ibubapa, pendapatan keluarga, dan pengukuran pada permulaan kajian), dilaksanakan dalam SPSS versi 22. Tahap signifikan ditetapkan pada alfa 0.05. Analisa subkumpulan dilakukan untuk kanak-kanak berlebihan berat dan obes. Keputusan dipersembahkan bagi keseluruhan sampel dan bagi subkumpulan kanak-kanak berlebihan berat dan obes.

Hasil kajian: Kadar respons ialah 91%. Pada enam-bulan pasca latihan, kumpulan intervensi mempunyai penurunan IJB z-skor yang signifikan berbanding kumpulan kawalan bagi semua sampel ($F(6, 517) = 2.817$, $p = 0.008$) dan subkumpulan obes ($F(6, 297) = 6.072$, $p = 0.000$). Penurunan signifikan bagi persentil lilitan pinggang bagi kumpulan intervensi berbanding kumpulan kawalan bagi subkumpulan obes ($F(6, 297) = 3.998$, $p = 0.001$). Peratusan lemak badan telah turun secara signifikan berbanding kumpulan kawalan ($F(6, 201) = 2.526$, $p = 0.022$) bagi subkumpulan berlebihan berat badan, Terdapat juga perbezaan yang signifikan antara kumpulan intervensi dan kawalan bagi faktor ibubapa dan kanak-kanak. Kumpulan intervensi menunjukkan peningkatan dalam jumlah skor pengetahuan ibu bapa (sampel keseluruhan; subkumpulan obese; subkumpulan berlebihan berat badan), penambahbaikan dalam amalan pemakanan (sampel keseluruhan; subkumpulan obese), peningkatan efikasi-kendiri berkenaan aktiviti fizikal anak mereka (sampel keseluruhan; subkumpulan berlebihan berat badan) dan gaya keibubapaan autoritatif (subkumpulan berlebihan berat badan). Bagi faktor kanak-kanak, kumpulan intervensi menunjukkan pengurangan menikmati makanan (sampel keseluruhan; subkumpulan obese; subkumpulan berlebihan berat badan) dan peningkatan pengambilan buah-buahan dan sayur-sayuran (sampel keseluruhan; subkumpulan obes).

Kesimpulan: Program empat bulan intervensi REDUCE yg disampaikan melalui media sosial dan sesi bersemuka ini adalah efektif dalam mengurangkan adipositi kanak-kanak berlebihan berat badan dan obes dan menambahbaik beberapa faktor ibubapa dan kanak-kanak. Keputusan ini menunjukkan bahawa program intervensi REDUCE ini boleh dimasukkan ke dalam program pencegahan kegemukan kanak-kanak yang disampaikan oleh pusat penjagaan kesihatan primer.

Kata kunci: Kegemukan kanak-kanak, intervensi berasaskan keluarga, media sosial, percubaan lapangan rawak terkawal, IJB z-skor.

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I certify that a Thesis Examination Committee has met on 18 May 2017 to conduct the final examination of Norliza binti Ahmad on her thesis entitled "Effectiveness of Social Media and Face-To-Face Family-Based Intervention in Improving Adiposity among Malay School Children in Bangi, Selangor, Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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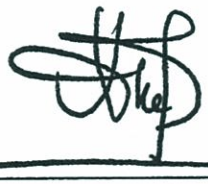

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS/NOTATIONS/GLOSSARY OF TERMS

<	Less than
>	Greater than
≤	Less than or equals to
≥	Greater than or equals to
BMI	Body mass index
BMI z-scores	Body mass index z-scores
BIA	Bioelectrical impedance analysis
CEBQ	Children's eating behaviour questionnaire
CDC	Centre for Disease Control
CFA	Confirmatory factor analysis
CFSQ	Caregiver's feeding style questionnaire
CI	Confidence interval
CONSORT	Consolidated Standards of Reporting Trials
DD	Desire to drink
DXA	Dual energy X-ray absorptiometry
EF	Enjoyment of food
EFA	Exploratory factor analysis
EOE	Emotional overeating
EUE	Emotional undereating
FF	Food fussiness
FR	Food responsiveness
FV	Fruit and vegetable
GDP	Gross domestic product

GLMM	Generalised linear mixed model
HDL	High-density lipoprotein
ICC	Intraclass correlation
IJB	Indeks jisim badan
IOTF	International Obesity Task Force
IT	Information technology
KMO	Kaiser-Meyer-Olkin
LBC	Lifestyle behaviour checklist
LDL	Low-density lipoprotein
MET	Metabolic equivalent
MOE	The Ministry of Education
MOH	The Ministry of Health
MVPA	Moderate-to-vigorous physical activity
NCDP-1M	Non-communicable disease prevention-1Malaysia
PCA	Principal component analysis
PECHWB	Parent Efficacy for Child Healthy Weight Behaviour Scale
REDUCE	Reorganise diet, uncontrolled screen time and exercise
RCT	Randomised controlled trial
SD	Standard deviation
SCT	Social cognitive theory
SE	Slowness in eating
SEANUTS	South East Asian Nutrition Surveys
SPSS	Statistical package for the social science
SR	Satiety responsiveness

SSB	Sugar-sweetened beverages
TG	Triglycerides
TOPSE	Tool to measure parenting self-efficacy
USA	The United States of America
USD	United State dollar
UK	The United Kingdom
WC	Waist circumference
WHO	The World Health Organisation

CHAPTER 1

INTRODUCTION

1.1 Background

The prevalence of overweight and obesity is increasing in both adult and child populations throughout the world. The World Health Organisation (WHO) reported that the worldwide obesity prevalence had doubled since 1980 (World Health Organization, 2016). In 2014, more than 1.9 billion adults, over the age of 18, were classified as overweight (39%), with 600 million classified as obese (13%) (World Health Organization, 2016). Globally, 42 million infants and young children younger than five years old were classified as overweight and obese in 2013, compared to 32 million in 1990 (World Heath Organization, 2017). The majority of these children live in low- and middle-income countries where the rate of increase is 30% higher than that of developed countries. WHO had estimated that, if the current trends continue, by the year 2025, the global number of overweight and obese infants and young children will increase to 70 million (World Health Organization, 2017).

Overweight and obesity are leading causes of increased risk of death throughout the world (World Health Organisation, 2015). The immediate health effects include greater risk for cardiovascular disease, such as dyslipidaemia, hypertension, insulin resistance and metabolic syndrome (Bridger, 2009). In a population-based sample of children aged 5 to 17 years, 70% of obese youth had at least one risk factor for cardiovascular disease (Freedman, 2007). They were also more likely to have type 2 diabetes, non-alcoholic fatty liver disease, (Kelsey, Bjornstad, & Nadeau, 2014), bone and joint problems (Han, 2010; Taylor, 2006), sleep apnoea and asthma (Han, 2010; Sutherland, 2008), and social and psychological problems, such as stigmatisation and poor self-esteem (Tang-Peronard, 2008; Puhl, 2007). Obese children are more likely to become obese as adults and are, therefore, more at risk for adult health problems such as cardiovascular disease, type 2 diabetes, infertility, orthopaedic complications, psychiatric disease and several types of cancer (Kelsey et al., 2014).

Besides the short term and long term health complications of obesity on individuals, it is also costly at a national level. The United States estimated total obesity-related costs at USD316 billion in 2010 (Ogden, Carroll, Kit, & Flegal, 2014), and this cost is predicted to exceed USD850 billion in 2030 (Wang, Beydoun, Liang, Caballero, 2008).

Malaysia is also facing the problem of childhood obesity with increasing prevalence from 1% in 1990 (Ismail & Vickneswary, 1999) to 12% in 2015 (Ministry of Health Malaysia, 2015). Unless something is done, Malaysia will continue to produce overweight and obese children and, hence, there will be an increase in the population of overweight and obese adults, leading to a reduction in the productivity of its human

resources and bearing the greater burden of increasing health care costs. Thus, effective programmes, targeting the masses to prevent and treat childhood obesity, and thus subsequently reverse these rates, are urgently needed.

1.2 Statement of problem

Parents play a vital role in shaping and maintaining healthful eating and physical activity habits in their children and subsequently preventing childhood overweightness and obesity (Lindsay, Sussner, Kim, & Gortmaker, 2006). Parents influence their children by promoting certain attitudes, by reinforcing specific behaviours and by serving as role models. Parents make daily decisions for children's eating and physical activity e.g. food selection and recreational opportunities (Institute of Medicine, 2004). Thus, parents can promote healthy habits and alter unhealthy habits.

However, urbanisation and socio-economic advancement have led to changes in lifestyle where parents are cooking less, and feeding their families more fast foods (Maher, 2017). Trends of food intake patterns, derived from the food balance sheet data, showed that the calorific intake increased from 2,430 kcal per person per day, in 1961, to 2,990 kcal per person per day, in 1997. Comparing between 1961 and 1997, this increase in caloric intake resulted from increased intake of meat, eggs, and fish (from 6.2% to 14.3%); sweeteners (from 9.5% to 18%); and oils and fats (from 11.4% to 14.8%). In contrast, the calories obtained from cereals decreased from 61%, in 1961, to 41% in 1997. The SEANUTS Malaysia found that Malaysian children aged seven to 12 did not meet Malaysian Dietary Guidelines' recommendations, except for meat/poultry. These include cereals/grains, legumes, fruits, vegetables, fish, and milk/dairy products (Hui et al., 2016). This could be due to more children eating food outside their homes, rather than home prepared meals, where parents have minimal control over the food content.

The increase in eating out practices among families resulted from more working mothers, with fewer having domestics maids, as well as spending more time as families during weekends and entertaining relatives and friends (Noraziah & Mohd Azlan, 2012). The trend of eating out was evident from the increase in monthly household consumption expenditure from 10.9%, in 2009, to 12.7%, in 2014 (Department of Statistics, 2014). Fast food consumption could also have contributed to the unmet dietary recommendations for these children. A survey showed that only 3.4% respondents reported that he/she did not eat at fast-food restaurants and that the majority either eat fast food less than once per week (50.8%) or one to three times per week (36.1%) (Statista, 2016). Even though the survey did not specify the age of the respondents, this reflected the fast-food preferences among Malaysians and and it is quite possible that Malaysian children may have similar preferences. A study among Selangor urban community showed that 17% of of the respondents aged 12 to 65 years consumed fast food for at least once per week and 53% of them were young people aged less than 24 years (Abdullah, Mokhtar, Bakar, & Al-Kubaisy, 2015).

For sedentariness, the SEANUTS Malaysia found that children aged seven to 12 years spent 6.7 hours on sedentary activities per day, with half of the time spent on screen time (3.1 hours) (Lee et al., 2015). The same survey found that overweight and obese children were significantly less active (mean physical activity score of 2.46, SD = 0.03) than normal weight children (mean physical activity score of 2.54, SD = 0.03). Pedometer steps counts were 8,271 steps for overweight and obese children and 9,326 steps for normal weight children.

Childhood obesity had become one of the major public health concerns (de Onis, Blössner, & Borghi, 2010; Organization, 2015; World Health Organization, 2014), including in Malaysia. The prevalence of children under five that are underweight has reduced from 22.1%, in 1990, to 12.9%, in 2006 (World Bank, 2013). The SEANUTS Malaysia found that the prevalence of thinness and stunting among children aged six months to 12 years was 5.4% and 8.4%, respectively, in contrast with the higher prevalence of overweight and obesity within the same period (9.8% and 11.8% respectively) (Poh et al., 2013).

In the1990s, the prevalence of obesity among children aged 13 to 17 years was 1% in 1990, which later increased to 6% in 1997 (Ismail & Vickneswary, 1999). Another study among children aged seven to 16 years found the prevalence to be 3.5% and 6.0% for obesity and overweight, respectively (Kasmini et al., 1997). In 2007, a cross-sectional study involving 3,333 children aged 13 to 17 years showed 8.2% were obese and 11.4% were overweight (Rampal et al., 2007).

In recent data, the prevalence of obesity among children under 18 was 4% in 2011, and increased to 12% in 2015 (Ministry of Health Malaysia, 2015; Ministry of Health Malaysia, 2011). The highest obesity prevalence among children was observed among children aged five to 14 years (14%) (Ministry of Health Malaysia, 2015). Another survey, the South East Asian Nutrition Surveys (SEANUTS) Malaysia involving 3,542 children aged six months to 12 years, found that the prevalence of overweight and obesity were 9.8% and 11.8%, respectively (Poh et al., 2013). Thus, the prevalence of both overweighted and obesity accounted for about one-fifth of the total population of this age group. This high percentage has placed Malaysia as the top ranking country, in terms of the prevalence of childhood obesity, in South East Asia (Ng et al., 2014).

Childhood obesity poses increased risks of developing many adverse health effects either during childhood or during adulthood (Biro & Wien, 2010; De Pergola & Silvestris, 2013; Kalarchian & Marcus, 2012; Nathan & Moran, 2008; Pulgarón, 2013). Furthermore, there is tendency that these obese children will become obese adults and, thus, be at increased risk of developing adult health problems (Kelsey et al., 2014). A reduction of children's adiposity which comprised of BMI z-score, waist circumference and percentage of total body fat may reduce the risk of these overweight and obese children from having complications in later life especially cardio-metabolic disorders.

Studies showed that reduction in BMI z-score was associated with improvement in components of metabolic syndrome e.g. insulin, total cholesterol, low-density lipoprotein (LDL), total/ high-density lipoprotein (HDL) cholesterol ratio and hypertension (Reinehr et al., 2016; Kolsgaard et al., 2011; Reinehr, Kleber and Toschke, 2009). A longitudinal study of 4,603 ethnically diverse adolescents (6th and 8th grade) found that change in BMI z-score was associated with change in the majority of the cardiovascular risk factors (Jago, Mendoza, Chen & Baranowski, 2013).

Waist circumference (WC) was found to be a better predictor of abnormal blood levels of substances critical to metabolism than BMI z-scores (Lárusdóttir, Bjarnason, Björnsdóttir, Brynjólfsdóttir, Ólafsdóttir, 2015). One of the recommendations was that WC to be used to screen children to identify those who should be under medical supervision because they are at risk of developing metabolic disorders. A reduction in WC measurement was associated with changes in fasting glucose levels (Jago, Mendoza, Chen & Baranowski, 2013) whereas high WC (≥ 90th percentile) was associated with low level of HDL and high level of triglycerides and high fasting insulin level when compared with those with a WC in the normal range (Bassali, Waller, Gower, Allison, & Davis, 2011). This suggests that it is vital to reduce obese children's WC in order to reduce their risk of developing cardiovascular disease. Despite the clinical importance of reduction in WC there is still a dearth of studies investigating what constitutes a clinically meaningful reduction in WC by relating WC to clinical outcomes.

Another aspect of adiposity that may be a more effective indicator of early cardiovascular risk than BMI is percentage of body fat (Yamashita et al., 2012; Zeng, Dong, Sun, Xie, & Cui, 2012). Hence, effective programmes that prevent and treat childhood obesity, which will subsequently reduce the cardio-metabolic risk and other risks, are urgently needed.

Even though the prevalence of childhood obesity in Malaysia has increased from 4% in 2011 to 12% in 2015 (Ministry of Health Malaysia, 2015; Ministry of Health Malaysia, 2011), appropriate intervention strategies targeting this issue are still lacking and fragmented (Vikneswaran et al., 2015). Obesity should be regarded as a disease in order that it is treated more actively to achieve weight loss (Jensen et al., 2014). Despite guidelines and strategies that have been put in place by the Ministry of Health for the management of childhood obesity in the community, there is the possibility for certain programmes to be neglected due to staff shortages (Vikneswaran et al., 2015). Parents, on the other hand seldom underestimate their child's weight status (Muhammad et al, 2008). This is not only in Malaysia, but in other parts of the world as well, as a meta-analysis showed that half of the parents underestimated their children's overweight/obese status (Lundahl, Kidwell, & Nelson, 2014).

Parents could play an important role in reducing the childhood obesity epidemic as they can have a strong influence on their children's energy intake and energy output. Unfortunately some parents do not understand the relationships between dietary intake, physical activity, body weight and the related health risks (McGarvey et. al., 2006). Thus, parents need to be educated, provided with relevant skills and motivated to help and assist their children to have a better weight. As children are growing, it is not necessary for them to attain weight reduction in order to have reduced cardiovascular risks. They can maintain their weight, with the exception of those who have reached their final height, who should make efforts to lose weight (CPG Obesity, 2003).

Family-based behavioural treatment programmes, which include only the parent or both parent and child, have been demonstrated to be effective over the past several decades (Berge & Everts, 2011; Golan & Crow, 2004; Golley, Hendrie, Slater, & Corsini, 2011; Golley, Magarey, Baur, Steinbeck, & Daniels, 2007). A recent systematic review and meta-analysis, which involved 42 weight-related health interventions, showed that interventions which required the parents' participation were more effective in reducing body mass indexes of child and adolescent participants (Niemeier, Hektner, & Enger, 2012). In addition, longer interventions that included parents appeared to have greater success. Unfortunately, a large proportion of participating families, ranging from about 20% to 73%, dropped out of treatment, and most often the reasons were scheduling issues and programmes failing to meet family needs or expectations (Skelton & Beech, 2011).

Weight management programmes delivered over the internet could be an attractive option because participants are not subjected to common barriers to obesity treatment, such as difficulties with scheduling or transportation or the need to be near to a specialty clinic, as well as having the advantages of accessibility at all times, being offered at lower cost than traditional, labour-intensive counselling, and having increased personal convenience (Harvey-Berino, Pintauro, & Gold, 2002; Winett, Tate, Anderson, Wojcik, & Winett, 2005). A recent systematic review of internet-based intervention for childhood obesity among school children concluded that such intervention is useful (Antwi et al., 2013). However, there is a scarcity of research examining the effectiveness of using the internet in family-based interventions. About 65% of the Malaysian population are internet users (Burson-Marsteller, 2011), making it possible to test the effectiveness of such an intervention among Malaysian parents. There is also a recognised need for Malaysian primary health care personnel to "catalyse intervention efforts in the family and in the community" in order to reduce the prevalence of obesity (Technical Committee on Strategies for the Prevention of Obesity Malaysia, 2005, p.62).

Interventions that were based on sound theory were found to be more efficacious than non-theory based interventions (Diep, Chen, Davies, Baranowski, & Baranowski, 2014). Therefore, this study used social cognitive theory (SCT) which is one of the recommended theories to be used for studies that involved parents as agents of change for treating childhood obesity by American Heart Association (Faith et al , 2012).

SCT is also one of the most frequently used theories in studies that used the Internet to promote health behaviour change (Webb, Joseph, Yardley, & Michie, 2010). This research intends to evaluate the effectiveness of this newly developed family-based intervention by conducting a randomized controlled field trial and, if effective, to apply it at primary health care centres.

1.3 Significance of study

The issue of overweight and obesity among children seldom receives attention, either from their parents or health care providers, until they have developed complications. Some parents do not realise that children who are overweight and obese are associated with health problems during their childhood period or in later life. Parents perceived overweight and obese children as well-fed children and as a symbol of both health and wealth (Jones, Parkinson, Drewett, Hyland & Pearce, 2011).

Health care providers, on the other hand, are mainly occupied with other serious illnesses in children, leaving the overweightness and obesity issue among children to be left unattended until it poses problems to the children. Therefore, this intervention if proven effective will be useful for improvement in the current health programme, whereby:

i) Overweight and obese children can be referred to health care centres for management of their weight problem, as the weight management programme is available.
ii) Parents can be empowered and act as an 'available resource' and as agents of change to assist in managing weight of their children and the family as a whole.
iii) Healthcare personnel can be the catalyst in the intervention efforts for the family and community in order to reduce the prevalence of obesity.
iv) The cost in providing a weight management programme for the overweight and obese children is expected to be minimal, as the programme only hinges on the existing resources, i.e., the internet and relevant trained health personnel (nurses, nutritionists or health promotion officers).

It is envisaged that this will improve the quality of life of the children, by empowering and facilitating parents to improve healthy family lifestyle practices. This research aims to evaluate the effectiveness, for parents and children, of a new and innovative family-based intervention, harnessing social media to educate and provide skills to parents, using a randomised controlled field trial.

1.4 Research questions

1. Is the REDUCE intervention programme effective in:
   a) Increasing parents' healthy lifestyle knowledge and practices?
   b) Improving parents' authoritative feeding styles?
   c) Improving parental self-efficacy?

2. Is the REDUCE intervention programme effective in:
   a) Improving "food approach" components of children's eating behaviours (food responsiveness, enjoyment of food and satiety responsiveness)?
   b) Decreasing children's sugar-sweetened beverages intake?
   c) Increasing children's fruit and vegetable intake?
   d) Decreasing children's unhealthy snack intake?
   e) Increasing children's moderate to vigorous physical activity?
   f) Decreasing children's screen time?
3. Is the REDUCE intervention programme effective in:
   a) Decreasing children's BMI z-score?
   b) Decreasing children's waist circumference percentile?
   c) Decreasing children's percentage of body fat?

1.5 Objectives

1.5.1 General objective

To develop, implement, and evaluate the effectiveness of the REDUCE (reorganised diet, uncontrolled screen time and exercise) programme, a family-based intervention delivered face-to-face and via social media, to reduce BMI z-scores, waist circumference percentile and percentage of total body fat amongst overweight and obese Malay school children in Bangi, Selangor.

1.5.2 Specific objectives

1. To develop a family-based healthy lifestyle intervention programme for managing overweight and obese children delivered face-to-face and via social media to reduce BMI z-scores, waist circumference percentile and percentage of total body fat amongst overweight and obese Malay school children in Bangi, Selangor.
2. To determine socio-demographic factors, children's adiposity (BMI z-score, waist circumference percentile and percentage of total body fat), parental factors (parental knowledge on nutrition, physical activity and obesity related health risks; healthy lifestyle practices; feeding styles and self-efficacy) and children's factors (eating behaviours; consumption of sugar sweetened beverages, fruit and vegetables and unhealthy snacks; physical activity and screen time) at baseline.
3. To implement and evaluate the effect of the intervention (between and within groups) for whole sample, overweight and obese subgroups at immediate post-training, 3 month and 6 month post-training on:
   a) Parental knowledge regarding nutrition, physical activity and obesity-related health risk, healthy lifestyle practices, authoritative feeding style and parents' self-efficacy.
   b) "Food approach" components of children's eating behaviour (food responsiveness, enjoyment of food and satiety responsiveness), healthy and unhealthy food/beverages intake (sugar-sweetened beverages, fruit and vegetables and unhealthy snacks), energy expenditure (moderate to vigorous

physical activity), and screen time (playing computer games and television viewing).

c) Children's anthropometric measurements (BMI z-scores, waist circumference percentile) and percentage of total body fat.

1.6 Hypotheses

H1. The REDUCE intervention programme is effective in:
a) Increasing parents' healthy lifestyle knowledge and practices.
b) Improving parents' authoritative feeding styles.
c) Improving parental self-efficacy.

H2. The REDUCE intervention programme is effective in:
a) Improving "food approach" components of children's eating behaviours (food responsiveness, enjoyment of food and satiety responsiveness).
b) Decreasing children's sugar-sweetened beverages intake.
c) Increasing children's fruit and vegetable intake.
d) Decreasing children's unhealthy snack intake.
e) Increasing children's moderate to vigorous physical activity.
f) Decreasing children's screen time.

H3. The REDUCE intervention programme is effective in:
a) Decreasing children's BMI z-score.
b) Decreasing children's waist circumference percentile.
c) Decreasing children's percentage of body fat.

This chapter has highlighted the issue of childhood obesity and the significance of this study in relation to public health, posed the research questions and stated the hypotheses and objectives. The next chapter will expand on what was laid out in chapter one, including definition of outcomes, prevalence of obesity in children, related factors, current childhood obesity prevention and control, family-based intervention and the theory used.

REFERENCES

Abraham, C. & Michie, S. (2008). A taxonomy of behaviour change techniques used in interventions. Health Pschology, 27(3), 379-387. http://doi.org/10.1037/0278-6133.27.3.379(NME/mvu) Kelley, G. a, & Kelley, K. S. (2013). Effects of exercise in the treatment of overweight and obese children and adolescents: a systematic review of meta-analyses. *Journal of Obesity*, *2013*(12), 1–10. http://doi.org/10.1155/2013/783103

Abdullah, N. N., Mokhtar, M. M., Bakar, M. H. A., & Al-Kubaisy, W. (2015). Trend on Fast Food Consumption in Relation to Obesity among Selangor Urban Community. *Procedia - Social and Behavioral Sciences*, *202*(December 2014), 505–513. http://doi.org/http://dx.doi.org/10.1016/j.sbspro.2015.08.189

ACAORN. (2010). Dietary intake assessment -24-hr recall. Retrieved from http://www.acaorn.org.au/streams/nutrition/assessment-methods/24hr-recall.php

Ahern, D. K., Phalen, J. M., Le, L. X., & Goldman, R. E. (2007). Childhood Obesity Prevention and Reduction: Role of eHealth. *Health E-Technologies*, 5–39.

Ainsworth, B. E., Haskell, W. L., Herrmann, S. D., Meckes, N., Bassett, D. R., Tudor-Locke, C., … Leon, A. S. (2011). 2011 Compendium of Physical Activities. *Medicine & Science in Sports & Exercise*, *43*(8), 1575–1581. http://doi.org/10.1249/MSS.0b013e31821ece12

Ali, N., & Abdullah, M. (2012). The food consumption and eating behaviour of Malaysian urbanites. issues and concerns. *Malaysian Journal of Society and Space*, *3*(1), 44–53.

Alkon, A., Crowley, A. A., Neelon, S. E. B., Hill, S., Pan, Y., Nguyen, V., … Kotch, J. B. (2014). Nutrition and physical activity randomized control trial in child care centers improves knowledge, policies, and children's body mass index. *BMC Public Health*, *14*(1), 215. http://doi.org/10.1186/1471-2458-14-215

Amarra, M. S. V, & Khor, Geok L Chan, P. (2016). Intake of added sugar in Malaysia: a review. *Asia Pacific Journal of Clinical Nutrition*, *25*(2), 227–240. http://doi.org/10.6133/apjcn.2016.25.2.13

Anand, S. S., Davis, A. D., Ahmed, R., Jacobs, R., Xie, C., Hill, A., … Yusuf, S. (2007). A family-based intervention to promote healthy lifestyles in an aboriginal community in Canada. *Canadian Journal of Public Health*, *98*(6), 447–452. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed8&NEWS=N&AN=19039880

Antwi, F. A., Fazylova, N., Garcon, M. C., Lopez, L., Rubiano, R., & Slyer, J. T. (2013). Effectiveness of web-based programs on the reduction of childhood obesity in school-aged children: A systematic review. *JBI Database of Systematic Reviews and Implementation Reports*, *11*(6), 1–44. http://doi.org/http://dx.doi.org/10.11124/jbisrir-2013-459

Au, L. E., Whaley, S., Rosen, N. J., Meza, M., & Ritchie, L. D. (2016). Online and In-Person Nutrition Education Improves Breakfast Knowledge, Attitudes, and Behaviors: A Randomized Trial of Participants in the Special Supplemental Nutrition Program for Women, Infants, and Children. *Journal of the Academy of Nutrition and Dietetics*, *116*(3), 490–500. http://doi.org/10.1016/j.jand.2015.10.012

Aziz, M. F. A., & Devi, M. N. (2012). Nutritional status and eating practices among children aged 4-6 years old in selected urban and rural kindergarten in Selangor, Malaysia. *Asian Journal of Clinical Nutrition*. http://doi.org/10.3923/ajcn.2012.116.131

Bandura, A. (1986). *Social Foundations of Thought and Action: A Social-Cognitive Theory*. *Prentice-Hall*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1989). Human agency in social cognitive theory. *The American Psychologist*, *44*(9), 1175–1184. http://doi.org/10.1037/0003-066X.44.9.1175

Bandura, A. (1997). *Self-efficacy: The Exercise of Control*. *Encyclopedia of human behavior* (Vol. 4). New York: WH Freeman and Co. http://doi.org/10.1002/9780470479216.corpsy0836

Bandura, A. (2012). On the Functional Properties of Perceived Self-Efficacy Revisited. *Journal of Management*, *38*(1), 9–44. http://doi.org/10.1177/0149206311410606

Barlow, S. E. (2007). Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. *Pediatrics*, *120 Suppl*, S164–S192. http://doi.org/10.1542/peds.2007-2329C

Bauman, A. E., Sallis, J. F., Dzewaltowski, D. A., & Owen, N. (2002). Toward a better understanding of the influences on physical activity: The role of determinants, correlates, causal variables, mediators, moderators, and confounders. *American Journal of Preventive Medicine*, *23*(2 SUPPL. 1), 5–14. http://doi.org/10.1016/S0749-3797(02)00469-5

Beattie, S., Woodman, T., Fakehy, M., & Dempsey, C. (2015). The Role of Performance Feedback on the Self-Efficacy-Performance Relationship. *Sport, Exercise, and Performance Psychology*, *5*(1), 1–13. http://doi.org/10.1037/spy0000051

Bentley, G. F., Goodred, J. K., Jago, R., Sebire, S. J., Lucas, P. J., Fox, K. R., … Turner, K. M. (2012). Parents' views on child physical activity and their implications for physical activity parenting interventions: a qualitative study. *BMC Pediatr*, *12*, 180. http://doi.org/1471-2431-12-180 [pii] 10.1186/1471-2431-12-180

Berge, J. M., & Everts, J. C. (2011). Family-Based Interventions Targeting Childhood Obesity: A Meta-Analysis. *Childhood Obesity (Formerly Obesity and Weight Management)*. http://doi.org/10.1089/chi.2011.07.02.1004.berge

Biro, F. M., & Wien, M. (2010). Childhood obesity and adult morbidities. *The American Journal of Clinical Nutrition*, *91*(5), 1499–1505. http://doi.org/10.3945/ajcn.2010.28701B.1

Bleakley, A., Jordan, A. B., & Hennessy, M. (2013). The relationship between parents' and children's television viewing. *Pediatrics*, *132*(2), e364-71. http://doi.org/10.1542/peds.2012-3415

Blissett, J. (2011). Relationships between parenting style, feeding style and feeding practices and fruit and vegetable consumption in early childhood. *Appetite*, *57*(3), 826–831. http://doi.org/10.1016/j.appet.2011.05.318

Bohman, B., Rasmussen, F., & Ghaderi, A. (2016). Development and psychometric evaluation of a context-based parental self-efficacy instrument for healthy dietary and physical activity behaviors in preschool children. *International Journal of Behavioral Nutrition and Physical Activity*, *13*(1), 110. http://doi.org/10.1186/s12966-016-0438-y

Boudreau, A. D. A., Kurowski, D. S., Gonzalez, W. I., Dimond, M. A., & Oreskovic, N. M. (2013). Latino families, primary care, and childhood obesity: A randomized controlled trial. *American Journal of Preventive Medicine*, *44*(3 SUPPL. 3). http://doi.org/10.1016/j.amepre.2012.11.026

Bridger, T. (2009). Childhood obesity and cardiovascular disease. *Paediatr Child Health*, *14*(3), 177–182.

Brouwer, W., Kroeze, W., Crutzen, R., De Nooijer, J., De Vries, N. K., Brug, J., & Oenema, A. (2011). Which intervention characteristics are related to more exposure to internet-delivered healthy lifestyle promotion interventions? A systematic review. *Journal of Medical Internet Research*, *13*(1), 1–19. http://doi.org/10.2196/jmir.1639

Brown, H. E., Atkin, A. J., Panter, J., Wong, G., Chinapaw, M. J. M., & Van Sluijs, E. M. F. (2016). Family-based interventions to increase physical activity in children: A systematic review, meta-analysis and realist synthesis. *Obesity Reviews*, (April), 345–360. http://doi.org/10.1111/ obr.12362

Brown, R., & Ogden, J. (2004). Children's eating attitudes and behaviour: A study of the modelling and control theories of parental influence. *Health Education Research*, *19*(3), 261–271. http://doi.org/10.1093/her/cyg040

Burrows, T., Hutchesson, M., Chai, L. K., Rollo, M., Skinner, G., & Collins, C. (2015). Nutrition interventions for prevention and management of childhood obesity: What do parents want from an ehealth program? *Nutrients*, *7*(12), 10469–10479. http://doi.org/10.3390/nu7125546

Burson-Marsteller. (2011). Asia-Pacific social media statistics. Retrieved 3 July 2014, from http://www.digitalbuzzblog.com/infographic-asia-pacific-social-media-statistics-stats-facts/

Butryn, M. L., Clark, V. L., & Coletta, M. C. (2011). Behavioral approaches to the treatment of obesity. *Textbook of Obesity: Biological, Psychological and Cultural Influences, 1st Ed.*, 253–272.

Byrd-Bredbenner C., Martin-Biggers J, Koenings M., Quick V., H. N. & W. J. (2017). HomeStyles, A Web-Based Childhood Obesity Prevention Program for Families With Preschool Children: Protocol for a Randomized Controlled Trial. *Journal of Medical Internet Res*, *6*(4). Retrieved from http://www.researchprotocols.org/2017/4/e73/

Campbell, K., Hesketh, K., Silverii, A., & Abbott, G. (2010). Maternal self-efficacy regarding children's eating and sedentary behaviours in the early years: Associations with children's food intake and sedentary behaviours. *International Journal of Pediatric Obesity*, *5*(6), 501–508.

Caprio, S., Daniels, S. R., Drewnowski, A., Kaufman, F. R., Palinkas, L. A., Rosenbloom, A. L., & Schwimmer, J. B. (2008). Influence of race, ethnicity, and culture on childhood obesity: Implications for prevention and treatment: A consensus statement of Shaping America's Health and the Obesity Society. *Diabetes Care*, *31*(11), 2211–2221. http://doi.org/10.2337/dc08-9024

Catenacci, V., Barrett, C., Odgen, L., Browning, R., Schaefer, C. A., Hill, J., & Wyatt, H. (2014). Changes in physical activity and sedentary behavior in a randomized trial of an internet-based versus workbook-based family intervention study. *Journal of Physical Activity & Health*, *11*(2), 348–58. http://doi.org/10.1123/jpah.2012-0043

Cavallo, D. N., Tate, D. F., Ries, A. V, Brown, J. D., Devellis, R. F., & Ammerman, A. S. (2013). A Social Media–Based Physical Activity Intervention: A Randomized Controlled Trial, *43*(5), 527–532. http://doi.org/10.1016/j.amepre.2012.07.019.A

Center for Disease Control and Prevention. (2014). Childhood Obesity Facts. http://doi.org/2016-09-19

Chee, W., & Nor, M. I. (2010). Maintain body weight in a healthy range. *Malaysian Dietary Guidelines*. Retrieved from http://www2.moh.gov.my/images/gallery/Garispanduan/diet/KM2.pdf

Chen, J. L., Weiss, S., Heyman, M. B., Cooper, B., & Lustig, R. H. (2011). The efficacy of the web-based childhood obesity prevention program in Chinese American adolescents (Web ABC study). *Journal of Adolescent Health*, *49*(2), 148–154. http://doi.org/10.1016/j.jadohealth.2010.11.243

Children, O., Beverages, S., & Activity, P. (2005). Parents Can Play a Role in Preventing Childhood Obesity, (September 2004), 2004–2005.

Coates, J., Colaiezzi, B., Fiedler, J. L., Wirth, J., Lividini, K., & Rogers, B. (2012). A program needs-driven approach to selecting dietary assessment methods for decision-making in food fortification programs, *33*(3), 146–156.

Constine, J. (2014). Facebook's New 'Creative Labs' Lets The 6,000-Employee Giant Move Fast Like A Startup. Retrieved 21 December 2016, from https://techcrunch.com/2014/01/30/facebook-creative-labs/

Consumer Association Of Penang. (2009). Malaysians are the 8th largest sugar consumers in the world. Retrieved from http://www.consumer.org.my/index.php/food/diseases/161-malaysians-are-the-8th-largest-sugar-consumers-in-the-world

Cooperberg, J. (2013). *Food for Thought: A Parental Internet-based Intervention to Treat Childhood Obesity in Preschool-aged Children*.

Coppock, J. H., Ridolfi, D. R., Hayes, J. F., St. Paul, M., & Wilfley, D. E. (2014). Current Approaches to the Management of Pediatric Overweight and Obesity. *Current Treatment Options in Cardiovascular Medicine*, *16*(11), 1–15. http://doi.org/10.1007/s11936-014-0343-0

CPG Obesity. (2003). Management of Obesity. *Ministry of Health Malaysia*.

Croker, H., Viner, R. M., Nicholls, D., Haroun, D., Chadwick, P., Edwards, C., … Wardle, J. (2012a). Family-based behavioural treatment of childhood obesity in a UK national health service setting: randomized controlled trial. *International Journal of Obesity*, *36*(1), 16–26. http://doi.org/10.1038/ijo.2011.182

Croker, H., Viner, R., Nicholls, D., Haroun, D., Chadwick, P., Edwards, C., … Wardle, J. (2012). Family-based behavioural treatment of childhood obesity in a UK National Health Service setting: randomized controlled trial. *International Journal of Obesity 2005*, *36*(1), 16–26. Retrieved from http://discovery.ucl.ac.uk/1323101/

Cullen, K. W., Baranowski, T., Owens, E., Marsh, T., Rittenberry, L., & de Moor, C. (2003). Availability, accessibility, and preferences for fruit, 100% fruit juice, and vegetables influence children's dietary behavior. *Health Education & Behavior : The Official Publication of the Society for Public Health Education*, *30*(5), 615–626. http://doi.org/10.1177/1090198103257254

Dahl, A. A., Hales, S. B., & Turner-McGrievy, G. M. (2016). Integrating social media into weight loss interventions. *Current Opinion in Psychology*, *9*, 11–15. http://doi.org/10.1016/j.copsyc.2015.09.018

Davison, K. K., & Birch, L. L. (2001). Childhood overweight: a contextual model and recommendations for future research. *Obes Rev*, *2*(3), 159–171. http://doi.org/10.1186/1471-2458-11-484

De Onis, M., Blössner, M., & Borghi, E. (2010). Global prevalence and trends of overweight and obesity among preschool children. *The American Journal of Clinical Nutrition*, *92*(5), 1257–1264. http://doi.org/10.3945/ ajcn.2010.29786.1

De Pergola, G., & Silvestris, F. (2013). Obesity as a major risk factor for cancer. *Journal of Obesity*, *2013*, 291546. http://doi.org/10.1155/ 2013/291546

Denise E. Wilfley, PhD; Richard I. Stein, PhD; Brian E. Saelens, PhD; Danyte S. Mockus, MPH; Georg E. Matt, PhD; Helen A. Hayden-Wade, PhD; R. Robinson Welch, PhD; Kenneth B. Schechtman, PhD; Paul A. Thompson, P. L. H. E. (2007). Efficacy of Maintenance Treatment Approaches for Childhood Overweight A Randomized Controlled Trial. *JAMA : The Journal of the American Medical Association*, *298*.

Deurenberg, P., Deurenberg-Yap, M., & Guricci, S. (2002). Asians are different from Caucasians and from each other in their body mass index/body fat per cent relationship. *Obesity Reviews*, *3*(3), 141–146. http://doi.org/10.1046/j.1467-789X.2002.00065.x

Diep, C. S., Chen, T., Davies, V. F., Baranowski, J. C., & Baranowski, T. (2014). Influence of Behavioral Theory on Fruit and Vegetable Intervention Effectiveness Among Children : A Meta-Analysis. *Journal of Nutrition Education and Behavior*, *46*(6), 506–546. http://doi.org/10.1016/j.jneb.2014.05.012

Dinsa, G. D., Goryakin, Y., Fumagalli, E., & Suhrcke, M. (2012). Obesity and socioeconomic status in developing countries: A systematic review. *Obesity Reviews*, *13*(11), 1067–1079. http://doi.org/10.1111/j.1467-789X.2012.01017.x

Downing, K. L., Salmon, J., Hinkley, T., Hnatiuk, J. A., & Hesketh, K. D. (2017). A mobile technology intervention to reduce sedentary behaviour in 2- to 4-year- old children (Mini Movers): study protocol for a randomised controlled trial, 1–8. http://doi.org/10.1186/s13063-017-1841-7

Draxten, M., Fulkerson, J. A., Friend, S., Flattum, C. F., & Schow, R. (2014). Parental role modeling of fruits and vegetables at meals and snacks is associated with children's adequate consumption. *Appetite*, *78*, 1–7. http://doi.org/10.1016/j.appet.2014.02.017

Edelson, L., Mokdad, C., & van der Horst, K. (2015). Caregiver Feeding Style Questionnaire: Reduced Version for Toddlers. *Faseb J*, *29*(1_Supplement), 901.6-. Retrieved from http://www.fasebj.org/cgi/content/long/29/1_Supplement/901.6

Edward, R. (2016). Children exposed to junk food at schools. *The Star Online*. Retrieved from http://www.thestar.com.my/metro/community/2016/05/25/children-exposed-to-junk-food-at-schools-street-vendors-serve-up-unhealthy-fare-right-at-the-gates/

Edwards, C., Nicholls, D., Croker, H., Van Zyl, S., Viner, R., & Wardle, J. (2006). Family-based behavioural treatment of obesity: acceptability and effectiveness in the UK. *European Journal of Clinical Nutrition*, *60*(5), 587–592. http://doi.org/10.1038/sj.ejcn.1602353

Ekelund, U., Luan, J., Sherar, L. B., Esliger, D. W., Griew, P., & Cooper, A. (2012). Moderate to vigorous physical activity and sedentary time and cardiometabolic risk factors in children and adolescents. *Jama*, *307*(7), 704–712. http://doi.org/10.1001/jama.2012.156

Epstein, L. H. (1996). Family-based behavioural intervention for obese children. *International Journal of Obesity and Related Metabolic Disorders : Journal of the International Association for the Study of Obesity*, *20 Suppl 1*, S14–S21.

Epstein, L. H., Gordy, C. C., Raynor, H. A., Beddome, M., Kilanowski, C. K., Paluch Abstract EPSTEIN, R., & Paluch, R. (2001). Increasing Fruit and Vegetable Intake and Decreasing Fat and Sugar Intake in Families at Risk for Childhood Obesity. *Obes Res*, *9*(26), 171–178. http://doi.org/10.1038/oby.2001.18

Epstein, L. H., McCurley, J., Wing, R. R., & Valoski, A. (1990). *Five-year follow-up of family-based behavioral treatments for childhood obesity. Journal of consulting and clinical psychology* (Vol. 58).

Epstein, L. H., Valoski, A., Wing, R. R., & McCurley, J. (1994). *Ten-year outcomes of behavioral family-based treatment for childhood obesity. Health psychology : official journal of the Division of Health Psychology, American Psychological Association* (Vol. 13).

Erkelenz, N., Kobel, S., Kettner, S., Drenowatz, C., & Steinacker, J. M. (2014). Parental activity as influence on children's BMI percentiles and physical activity. *Journal of Sports Science and Medicine*, *13*(3), 645–650.

Esfarjani, F., Khalafi, M., Mohammadi, F., Mansour, A., Roustaee, R., Zamani-Nour, N., & Kelishadi, R. (2013). Family-based intervention for controlling childhood obesity: An experience among iranian children. *International Journal of Preventive Medicine*, *4*(3), 358–365.

Etelson, D., Brand, D. a, Patrick, P. a, & Shirali, A. (2003). Childhood obesity: do parents recognize this health risk? *Obesity Research*, *11*(11), 1362–1368. http://doi.org/10.1038/oby.2003.184

Faith, M. S., Van Horn, L., Appel, L. J., Burke, L. E., Carson, J. A. S., Franch, A. H., ... Wylie-Rosett, J. (2012). Evaluating parents and adult caregivers as 'agents of change' for treating obese children: Evidence for parent behavior change strategies and research gaps: A scientific statement from the American heart association. *Circulation*, *125*(9), 1186–1207. http://doi.org/10.1161/CIR.0b013e31824607ee

Frankel, L. A., O'Connor, T. M., Chen, T. A., Nicklas, T., Power, T. G., & Hughes, S. O. (2014). Parents' perceptions of preschool children's ability to regulate eating. Feeding style differences. *Appetite*, *76*, 166–174. http://doi.org/10.1016/j.appet.2014.01.077

French, S. A., Epstein, L. H., Jeffery, R. W., Blundell, J. E., & Wardle, J. (2012). Eating behavior dimensions. Associations with energy intake and body weight. A review. *Appetite*, *59*(2), 541–549. http://doi.org/10.1016/j.appet.2012.07.001

Gaines, A., & Turner, L. W. (2009). Improving Fruit and Vegetable Intake Among Children: A Review of Interventions Utilizing the Social Cognitive Theory. *Californian Journal of Health Promotion*, *7*(1), 52–66. Retrieved from http://cjhp.fullerton.edu/Volume7_2009/Issue1/gaines.pdf

Gibson, S. (2008). Sugar-sweetened soft drinks and obesity: a systematic review of the evidence from observational studies and interventions. *Nutrition Research Reviews*, *21*(2), 134–147. http://doi.org/10.1017/ S0954422408110976

Golan, M. (2006). Parents as agents of change in childhood obesity - from research to practice. *International Journal of Pediatric Obesity*, *1*(2), 66–76. http://doi.org/10.1080/17477160600644272

Golan, M., & Crow, S. (2004). Targeting parents exclusively in the treatment of childhood obesity: long-term results. *Obesity Research*, *12*(2), 357–361. http://doi.org/10.1038/oby.2004.45

Golley, R. K., Hendrie, G. A., Slater, A., & Corsini, N. (2011a). Interventions that involve parents to improve children's weight-related nutrition intake and activity patterns - what nutrition and activity targets and behaviour change techniques are associated with intervention effectiveness? *Obesity Reviews*, *12*(2), 114–130. http://doi.org/10.1111/j.1467-789X.2010.00745.x

Golley, R. K., Hendrie, G. a., Slater, a., & Corsini, N. (2011b). Interventions that involve parents to improve children's weight-related nutrition intake and activity patterns - what nutrition and activity targets and behaviour change techniques are associated with intervention effectiveness? *Obesity Reviews*, *12*(2), 114–130. http://doi.org/10.1111/j.1467-789X.2010.00745.x

Golley, R. K., Magarey, A. M., Baur, L. A., Steinbeck, K. S., & Daniels, L. A. (2007). Twelve-Month Effectiveness of a Parent-led, Family-Focused Weight-Management Program for Prepubertal Children: A Randomized, Controlled Trial. *Pediatrics*, *119*(3), 517–525. http://doi.org/ 10.1542/peds.2006-1746

Golley, R. K., Perry, R. A., Magarey, A., & Daniels, L. (2007). Family-focused weight management program for five- to nine-year-olds incorporating parenting skills training with healthy lifestyle information to support behaviour modification. *Nutrition and Dietetics*, *64*(3), 144–150. http://doi.org/10.1111/j.1747-0080.2007.00106.x

Gruver, R.S., Bishop-Gilyard, C. T., Lieberman, A., Gerdes, M., Virudachalam, S., Suh, A.W., …& Fiks, A.G. (2016). A Social Media Peer Group Intervention for Mothers to Prevent Obesity and Promote Healthy Growth from Infancy: Development and Pilot Trial. *Journal of Medical Internet Res*, *5*(3).

Gubbels, J. S., Kremers, S. P., Stafleu, A., de Vries, S. I., Goldbohm, R. A., Dagnelie, P. C., … Thijs, C. (2011). Association between parenting practices and children's dietary intake, activity behavior and development of body mass index: the KOALA Birth Cohort Study. *Int J Behav Nutr Phys Act*, *8*(1), 18. http://doi.org/10.1186/1479-5868-8-18

Gupta, S. (2011). Intention-to-treat concept: A review. *Perspectives in Clinical Research*, *2*(3), 109. http://doi.org/10.4103/2229-3485.83221

Harvey-Berino, J., Pintauro, S. J., & Gold, E. C. (2002). The feasibility of using Internet support for the maintenance of weight loss. *Behavior Modification*, *26*(1), 103–116. http://doi.org/10.1177/0145445502 026001006

Hennessy, E., Hughes, S. O., Goldberg, J. P., Hyatt, R. R., & Economos, C. D. (2010). Parent behavior and child weight status among a diverse group of underserved rural families. *Appetite*, *54*(2), 369–377. http://doi.org/10.1016/j.appet.2010.01.004

Hernandez, R. G., Thompson, D. A., Cheng, T. L., & Serwint, J. R. (2012). Early-Childhood Obesity. *Clinical Pediatrics*, *51*(7), 663–670. http://doi.org/10.1177/0009922812440841

Herring, S. J., Cruice, J. F., Bennett, G. G., Davey, A., & Foster, G. D. (2014). Using Technology to Promote Postpartum Weight Loss in Urban, Low-Income Mothers: A Pilot Randomized Controlled Trial. *Journal of Nutrition Education and Behavior*, *46*(6), 610–615. http://doi.org/10.1016/j.jneb.2014.06.002

Hoerr, S. L., Hughes, S. O., Fisher, J. O., Nicklas, T. A, Liu, Y., & Shewchuk, R. M. (2009). Associations among parental feeding styles and children's food intake in families with limited incomes. *The International Journal of Behavioral Nutrition and Physical Activity*, *6*, 55. http://doi.org/10.1186/1479-5868-6-55

Holm, J. C., Nowicka, P., Farpour-Lambert, N. J., O'Malley, G., Hassapidou, M., Weiss, R., & Baker, J. L. (2014). The ethics of childhood obesity treatment-from the childhood obesity task force (COTF) of European association for the study of obesity (EASO). *Obesity Facts*, *7*(4), 274–281. http://doi.org/10.1159/000365773

Horton, L. A., Parada, H., Slymen, D. J., Arredondo, E., Ibarra, L., & Ayala, G. X. (2013). Targeting children's dietary behaviors in a family intervention: Entre familia: Reflejos de salud. *Salud Publica de Mexico*, *55*(SUPPL.3).

Hu, F. B. (2013). Resolved: There is sufficient scientific evidence that decreasing sugar-sweetened beverage consumption will reduce the prevalence of obesity and obesity-related diseases. *Obesity Reviews*, *14*(8), 606–619. http://doi.org/10.1111/obr.12040

Hughes, S. O., Cross, M. B., Hennessy, E., Tovar, A., Economos C. D., & Power, T. G. (2012). Caregiver's feeding styles questionnaire: Establishing cutoff points, *58*(1), 393–395. http://doi.org/10. 1016/j.appet.2011.11.011.Caregiver

Hughes, A. R., Stewart, L., Chapple, J., McColl, J. H., Donaldson, M. D. C., Kelnar, C. J. H., … Reilly, J. J. (2008). Randomized, controlled trial of a best-practice individualized behavioral program for treatment of childhood overweight: Scottish Childhood Overweight Treatment Trial (SCOTT). *Pediatrics*, *121*(3), e539–e546. http://doi.org/10.1542/ peds.2007-1786

Hughes, S. O., Power, T. G., Fisher, J.O, Mueller, S., & Nicklas, T. A. (2005). Revisiting a neglected construct: parenting styles in a child-feeding context. *Appetite*, *44*(1), 83–92. http://doi.org/10.1016/j.appet. 2004.08.007

Hui, C. K., Bee, K. P., Shoo, T. L., Kar, H. C., Bragdt, M. C. E., & Abd Talib, R. (2016). Are Malaysian children achieving dietary guideline recommendations? *Asia Pacific Journal of Public Health*, *June*(5 Suppl), 1–13. http://doi.org/10.1177/1010539516641504

Hunt, L. P., Ford, A., Sabin, M. a, Crowne, E. C., & Shield, J. P. H. (2007). Clinical measures of adiposity and percentage fat loss: which measure most accurately reflects fat loss and what should we aim for? *Archives of Disease in Childhood*, *92*(5), 399–403. http://doi.org/10.1136/ adc.2006.103986

Hunter, C. M., Peterson, A. L., Alvarez, L. M., Poston, W. C., Brundige, A. R., Haddock, C. K., … Foreyt, J. P. (2008). Weight Management Using the Internet. A Randomized Controlled Trial. *American Journal of Preventive Medicine*, *34*(2), 119–126. http://doi.org/10.1016/j.amepre.2007.09.026

Ibrahim, S., Karim, N. A, Oon, N. L., & Ngah, W. Z. W. (2013). Perceived physical activity barriers related to body weight status and sociodemographic factors among Malaysian men in Klang Valley. *BMC Public Health*, *13*(1), 275. http://doi.org/10.1186/1471-2458-13-275

Internet World Stats. (2014). Internet Users in the World by Regions June 2014. Retrieved 3 July 2014, from http://www.internetworldstats. com/stats.htm

Ismail, M. N., & Vickneswary, E. (1999). *Prevalence of obesity in Malaysia: Data from three ethnic groups. Country report at the Asian BMI/Obesity Workshop.*

Ismail, N., Karim, M. S. A., Adzahan, R. K. N. M., & Halim, N. A. (2013). Fruits and Vegetables Consumption Factor Based on Different Culture in Selangor State. *Academic Journal of Interdisciplinary Studies*, *2*(8), 524–530. http://doi.org/10.5901/ajis.2013.v2n8p524

Israel, A. C., Guile, C. A., & Baker, J. E. (1994). an Evaluation of Enhanced Self-Regulation Training in the Treatment of Childhood Obesity. *Journal of Pediatric Psychology*, *19*(6), 737–749. http://doi.org/10.1093/ jpepsy/19.6.737

Janicke, D. M., Sallinen, B. J., Perri, M. G., Lutes, L. D., Huerta, M., Silverstein, J. H., & Brumback, B. (2008). Comparison of parent-only vs family-based interventions for overweight children in underserved rural settings: outcomes from project STORY. *Archives of Pediatrics & Adolescent Medicine*, *162*(12), 1119–1125. http://doi.org/10.1001/ archpedi.162.12.1119

Jiang, J. X., Xia, X. L., Greiner, T., Lian, G. L., & Rosenqvist, U. (2005). A two year family based behaviour treatment for obese children. *Archives of Disease in Childhood*, *90*(12), 1235–1238. http://doi. org/10.1136/adc.2005.071753

John, J. H., & Ziebland, S. (2004). Reported barriers to eating more fruit and vegetables before and after participation in a randomized controlled trial: A qualitative study. *Health Education Research*, *19*(2), 165–174. http://doi.org/10.1093/her/cyg016

Jones, A.R., Parkinson, K.N., Drewett, R.F., Hyland, R.M., Pearce, M.S., Adamson, A.J., & the Gateshead Millennium Study Core Team. (2011). Parental perceptions of weight status in children: the Gateshead Millennium Study. *Int J Obes*, *35*(7), 953–962.

Kalarchian, M. A, & Marcus, M. D. (2012). Psychiatric comorbidity of childhood obesity. *International Review of Psychiatry (Abingdon, England)*, *24*(3), 241–6. http://doi.org/10.3109/09540261.2012.678818

Kalavainen, M., Korppi, M., & Nuutinen, O. (2011). Long-term efficacy of group-based treatment for childhood obesity compared with routinely given individual counselling. *International Journal of Obesity (2005)*, *35*(4), 530–533. http://doi.org/10.1038/sj.ijo.0803628

Kalavainen, M., Korppi, M. O. & Nuutinen, O. M. (2007). Clinical efficacy of group-based treatment for childhood obesity compared with routinely given individual counseling. *International Journal of Obesity*, *31*, 1500–1508.

Karanicolas, P. J., Farrokhyar, F., & Bhandari, M. (2010). Blinding: Who, what, when, why, how? *Canadian Journal of Surgery*, *53*(5), 345–348.

Kasmini, K., Idris, M. N., Fatimah, A., Hanafiah, S., Iran, H., & Asmah, M. N. (1997). Prevalence of overweight and obese school children aged between 7 to 16 years amongst the major 3 ethnic groups in Kuala Lumpur, Malaysia. *Asia Pacific Journal of Clinical Nutrition*.

Kelsey, M. M., Bjornstad, P., & Nadeau, J. (2014). Age-Related Consequences of Childhood Obesity, 222–228. http://doi.org/10.1159 /000356023

Kendall, S., & Bloomfield, L. (2005). Developing and validating a tool to measure parenting self-efficacy. *Journal of Advanced Nursing*, *51*(2), 174–181. http://doi.org/10.1111/j.1365-2648.2005.03479.x

Kim, S.A., Moore, L.V., Galuska, D., Wright, A.P. Harris, D. Grummer-Strawn, L.M., Merlo, C.L., Nihiser, A.J. & Rhodes, D. G. (2014). *Vital Signs: Fruit and Vegetable Intake Among Children — United States, 2003–2010*. Retrieved from http://www.cdc.gov/mmwr/ preview/ mmwrhtml/mm6331a3.htm?s_cid=mm6331a3_w

Kim, H. S., Park, J., Park, K., Lee, M., & Ham, O. K. (2016). Parent Involvement Intervention in Developing Weight Management Skills for both Parents and Overweight / Obese Children. *Asian Nursing Research*, *10*(1), 11–17. http://doi.org/10.1016/j.anr.2015.07.006

Kimble, A., Hubbs-Tait, L., Hayes, J., Sigman-Grant, M., Jahns, L., Dickin, K, Rafida, I. & Amy Mobley, A. (2014). Caregiver's feeding styles questionnaire — new factors and correlates (808.4). *Faseb J*, *28*(1S).

Kitzman-Ulrich, H., Hampson, R., Wilson, D. K., Presnell, K., Brown, A., & O'Boyle, M. (2009). An Adolescent Weight-Loss Program Integrating Family Variables Reduces Energy Intake. *Journal of the American Dietetic Association*, *109*(3), 491–496. http://doi.org/10.1016/ j.jada.2008.11.029

Knowlden, A., & Sharma, M. (2012). A feasibility and efficacy randomized controlled trial of an online preventative program for childhood obesity: Protocol for the EMPOWER intervention. *Journal of Medical Internet Research*, *14*(3). http://doi.org/10.2196/resprot.2141

Kosova, E. C., Auinger, P., & Bremer, A. A. (2013). The Relationships between Sugar-Sweetened Beverage Intake and Cardiometabolic Markers in Young Children. *Journal of the Academy of Nutrition and Dietetics*, *113*(2), 219–227. http://doi.org/10.1016/j.jand.2012.10.020

Kovalskys, I., Herscovici, C. R., Rougier, P. I., Gregorio, M. J. De, & Zonis, L. & Orellana, L. (2017). Study Protocol of MINI SALTEN : a technology-based multi-component intervention in the school environment targeting healthy habits of first grade children and their parents. *BMC Public Health*, 17(401), 1–10. http://doi.org/10.1186/s12889-017-4327-3

Krølner, R., Rasmussen, M., Brug, J., Klepp, K.-I., Wind, M., & Due, P. (2011). Determinants of fruit and vegetable consumption among children and adolescents: a review of the literature. Part II: qualitative studies. *International Journal of Behavioral Nutrition and Physical Activity*, *8*(1), 112. http://doi.org/10.1186/1479-5868-8-112

Krueger, C., & Tian, L. (2004). A comparison of the general linear mixed model and repeated measures ANOVA using a dataset with multiple missing data points. *Biol Res Nurs*, *6*(2), 151–157. http://doi.org/10.1177/1099800404267682

Lahti-Koski, M., & Gill, T. (2004). Defining childhood obesity. *Pediatr Adolesc Med.*, *9*, 1–19. Retrieved from http://www.karger.com/Article/PDF/78278

Langer, S., Crain, A., & Senso, M. (2014). Predicting child physical activity and screen time: parental support for physical activity and general parenting styles. *Journal of Pediatric*, 1–10. Retrieved from http://jpepsy.oxfordjournals.org/content/39/6/633.short

Lanza, E., Schatzkin, A., Daston, C., Corle, D., Freedman, L., Ballard-barbash, R., … Mateski, D. (2001). Implementation of a 4-y, high-fiber, high-fruit-and-vegetable, low-fat dietary intervention: results of dietary changes in the Polyp Prevention Trial. *Am J Clin Nutr*, 387–401.

Ledoux, T. A., Hingle, M. D., & Baranowski, T. (2011). Relationship of fruit and vegetable intake with adiposity: A systematic review. *Obesity Reviews*, *12*(501), 143–150. http://doi.org/10.1111/j.1467-789X.2010. 00786.x

Lee, S. T., Wong, J. E., Shanita, S. N., Ismail, M. N., Deurenberg, P., & Poh, B. K. (2015). Daily physical activity and screen time, but not other sedentary activities, are associated with measures of obesity during childhood. *International Journal of Environmental Research and Public Health*, *12*(1), 146–161. http://doi.org/10.3390/ijerph120100146

Lekhraj Rampal, G. R., Sidik, S. M., Rampal, S., Jie, D. W. Y., Lee, C. P., Shya, L. J., & Shun, S. Y. (2007). Prevalence of overweight among secondary school students in Klang District, Selangor. *Malaysian Journal of Nutrition*, *13*(1), 1–8.

Lindsay, A. C., Sussner, K. M., Kim, J., & Gortmaker, S. (2006). The role of parents in preventing childhood obesity. *The Future of Children*, *16*(1), 169–186. http://doi.org/10.1353/foc.2006.0006

Lingaraju, V. S. (2013). Why are people choosing WhatsApp Messenger over Facebook Messenger? Retrieved 3 January 2017, from https://www.quora.com/Why-are-people-choosing-WhatsApp-Messenger-over-Facebook-Messenger

Lloyd, L. J., Langley-Evans, S. C., McMullen, S., Luthans, F., Marcus, C., Nyberg, G., … Birch, L. L. (2005). Specific social influences on the acceptance of novel foods in 2-5-year-old children. *International Journal of Obesity (2005)*, *33*(4), 408–417. http://doi.org/10.1038/ijo.2009.38

Lochrie, A., Wysocki, T., Hossain, J., Milkes, A., Antal, H., Buckloh, L., … Lang, J. (2013). The Effects of a Family-Based Intervention (FBI) for Overweight/Obese Children on Health and Psychological Functioning. *Clin. Pract. Pediatr. Psychol.* http://doi.org/http://dx.doi. org/10.1037/cpp0000020

Loh, D. A., Moy, F. M., Zaharan, N. L., & Mohamed, Z. (2013). Eating behaviour among multi-ethnic adolescents in a middle-income country as measured by the self-reported Children's Eating Behaviour Questionnaire. *PloS One*, *8*(12), e82885. http://doi.org/10.1371/ journal.pone.0082885

Lundahl, A., Kidwell, K. M., & Nelson, T. D. (2014). Parental Underestimates of Child Weight: A Meta-analysis. *Pediatrics*, *133*(3), e689–e703. http://doi.org/10.1542/peds.2013-2690

Lustig, R. H. (2001). The neuroendocrinology of childhood obesity. *Pediatric Clinics of North America*, *48*(4), 909–930. http://doi.org/10.1016/S0031-3955(05)70348-5

Maher, C. A., Lewis, L. K., Ferrar, K., Marshall, S., De Bourdeaudhuij, I., & Vandelanotte, C. (2014). Are health behavior change interventions that use online social networks effective? A systematic review. *Journal of Medical Internet Research*, *16*(2), 1–13. http://doi.org/10.2196/jmir.2952

Maher, C., Ryan, J., Kernot, J., Podsiadly, J., & Keenihan, S. (2016). Social media and applications to health behavior. *Current Opinion in Psychology*, *9*, 50–55. http://doi.org/10.1016/j.copsyc.2015.10.021

Maher, H. (2017). It's 2017, Say Goodbye To Obesity And Start Educating Your Kids With Culinary Arts. *Malaysian Digest*. Retrieved from http://malaysiandigest.com/frontpage/282-main-tile/652093-it-s-2017-say-goodbye-to-obesity-and-start-educating-your-kids-with-culinary-arts.html

Malaysia, Department of Information. (n.d.). Population by states and ethnic group.

Malaysia, Department of Statistics. (2011). Population Distribution and Basic Demographic Characteristics. Retrieved 15 January 2016, from https://www.statistics.gov.my/index.php?r=column/ctheme&menu_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09&bul_id=MDMxdHZjWTk1SjFzTzNkRXYzcVZjdz09

Malaysia, Department of Statistics. (2017). Current population estimates, Malaysia, 2014 - 2016. Retrieved from https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=155&bul_id=OWlxdEVoYlJCS0hUZzJyRUcvZEYxZz09&menu_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09

Malik, V. S., Pan, A., Willett, W. C., & Hu, F. B. (2013). Sugar-sweetened beverages and weight gain in children and adults: a systematic review and meta-analysis. *The American Jounral of Clinical Nutrition*, *98*(4), 1084–102. http://doi.org/10.3945/ajcn.113.058362.1

Martínez-Vizcaíno, V., Sánchez-López, M., Notario-Pacheco, B., Salcedo-Aguilar, F., Solera-Martínez, M., Franquelo-Morales, P., … Rodríguez-Artalejo, F. (2014). Gender differences on effectiveness of a school-based physical activity intervention for reducing cardiometabolic risk: a cluster randomized trial. *The International Journal of Behavioral Nutrition and Physical Activity*, *11*, 154. http://doi.org/10.1186/s12966-014-0154-4

Mazzeo, S. E., Kelly, N. R., Stern, M., Gow, R. W., Cotter, E. W., Thornton, L. M., … Bulik, C. M. (2014). Parent skills training to enhance weight loss in overweight children: Evaluation of NOURISH. *Eating Behaviors*, *15*(2), 225–229. http://doi.org/10.1016/j.eatbeh.2014.01.010

McCallum, Z., Wake, M., Gerner, B., Baur, L. A., Gibbons, K., Gold, L., … Waters, E. (2007). Outcome data from the LEAP (Live, Eat and Play) trial: a randomized controlled trial of a primary care intervention for childhood overweight/mild obesity. *International Journal of Obesity (2005)*, *31*(4), 630–636. http://doi.org/10.1038/sj.ijo.0803509

McGarvey, E. L., Collie, K. R., Fraser, G., Shufflebarger, C., Lloyd, B., & Norman Oliver, M. (2006). Using focus group results to inform preschool childhood obesity prevention programming. *Ethnicity & Health*, *11*(3), 265–285. http://doi.org/10.1080/13557850600565707

Metcalf, B. S., & Henley, W. (2012). Effectiveness of intervention on physical activity of children: Systematic review and meta-analysis of controlled trials with objectively measured outcomes (EarlyBird 54). *BMJ (Online)*, *345*(7876). http://doi.org/10.1136/ bmj.e5888

Ministry of Health Malaysia. (2009). *Garis Panduan Perkhidmatan Berintegrasi di Klinik Kesihatan, 2009 (Guideline for Integrated Services in Health Clinics*.

Ministry of Health Malaysia. (2013). *Family Health Development Division: Annual Report 2012*.

Mohd Yazid, D. (2015). Program kesihatan sekolah dan program bersepadu sekolah sihat. Retrieved from http://ketuajabatanpendidikan jasmani.blogspot.my/2015/06/program-kesihatan-sekolah-dan-program.html

Morgan, P. J., Collins, C. E., Plotnikoff, R. C., Callister, R., Burrows, T., Fletcher, R., … Lubans, D. R. (2014). The 'Healthy Dads, Healthy Kids' community randomized controlled trial: A community-based healthy lifestyle program for fathers and their children. *Preventive Medicine*, *61*, 90–99. http://doi.org/10.1016/j.ypmed.2013.12.019

Muhammad, N. A., Omar, K., Shah, S. A., Muthupalaniappen, L. a P., & Arshad, F. (2008). Parental perception of their children's weight status, and its association with their nutrition and obesity knowledge. *Asia Pacific Journal of Clinical Nutrition*, *17*(4), 597–602.

Mustapha, F. I., Omar, Z. A., Mihat, O., Noh, K., Hassan, N., Bakar, R. A., … Allotey, P. (2014). Addressing non-communicable diseases in Malaysia : an integrative process of systems and community, *14*(Suppl 2), 2–7.

Myers, S., & Vargas, Z. (2000). Parental perceptions of the preschool obese child. *Pediatric Nursing*, *26*(1), 23–30.

Napolitano, M., Hayes, S., Bennett, G., Ives, A. K., & Foster, G. D. (2013). Using Facebook and text messaging to deliver a weight loss program to college students. *Obesity Journal*, *21*(1), 25–31. http://doi.org/10.1002/oby.20232

Nathan, B. M., & Moran, A. (2008). Metabolic complications of obesity in childhood and adolescence: more than just diabetes. *Current Opinion in Endocrinology, Diabetes, and Obesity*, *15*(1), 21–29. http://doi.org/10.1097/MED.0b013e3282f43d19

National Center for Chronic Disease Prevention and Health Promotion, D. of N. and P. A. (n.d.). Can eating fruits and vegetables help people to manage their weight ? *Research to Practice*, (1), 1–6. Retrieved from http://www.cdc.gov/nccdphp/dnpa/nutrition/pdf/rtp_practitioner_10_07.pdf

Nelson, M., & Davis, M. C. (2012). Development and Preliminary Validation of the Parent Efficacy for Child Healthy Weight Behaviour Scale. *Journal of Health Psychology*. http://doi.org/10.1177/1359105312439732

Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., … Gakidou, E. (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: A systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, *384*(9945), 766–781. http://doi.org/10.1016/S0140-6736(14)60460-8

NHS. (2011). A simple guide to classifying body mass index in children. https://khub.net/documents/31798783/32039025/A+simple+guide+to+classifying+body+mass+index+in+children/ced23256-6f8d-43c7-9f44-222e2beebf97?version=1.0

Niemeier, B. S., Hektner, J. M., & Enger, K. B. (2012). Parent participation in weight-related health interventions for children and adolescents: A systematic review and meta-analysis. *Preventive Medicine*, *55*(1), 3–13. http://doi.org/10.1016/j.ypmed.2012.04.021

Nor Aini, J., Poh, B. K., & Chee, W. S. S. (2013). Validity of a children's physical activity questionnaire (cPAQ) for the study of bone health. *Pediatrics International : Official Journal of the Japan Pediatric Society*, *55*(2), 223–8. http://doi.org/10.1111/ped.12035

Nucara, A., Pietrafesa, M., Rizzo, G., & Scaccianoce, G. (2012). Handbook of Anthropometry. *Handbook of Anthropometry*, 91–114. http://doi.org/10.1007/978-1-4419-1788-1

Nyberg, G., Sundblom, E., Norman, Å., Bohman, B., Hagberg, J., & Elinder, L. S. (2015). Effectiveness of a universal parental support programme to promote healthy dietary habits and physical activity and to prevent overweight and obesity in 6-year-old children: The healthy school start study, a cluster-randomised controlled trial. *PLoS ONE*, *10*(2), 1–14. http://doi.org/10.1371/journal.pone.0116876

Oenema, A., Brug, J., & Lechner, L. (2001). Web-based tailored nutrition education: results of a randomized controlled trial. *Health Educ Res*, *16*(6), 647–660. Retrieved from http://www.ncbi.nlm.nih.gov/ pubmed/11780705

Oenema, A., Tan, F., & Brug, J. (2005). *Short-term efficacy of a web-based computer-tailored nutrition intervention: main effects and mediators. Annals of behavioral medicine : a publication of the Society of Behavioral Medicine* (Vol. 29).

Ogden, C. L., & Flegal, K. M. (2010). Changes in terminology for childhood overweight and obesity. *National Health Statistics Reports*, (25), 1–5.

Okely, A. D., Collins, C. E., Morgan, P. J., Jones, R. A., Warren, J. M., Cliff, D. P., … Baur, L. A. (2010). Multi-site randomized controlled trial of a child-centered physical activity program, a parent-centered dietary-modification program, or both in overweight children: the HIKCUPS study. *The Journal of Pediatrics*, *157*(3), 394.e1-394. http://doi.org/10.1016/j.jpeds.2010.03.028

Organisation for Economic Co-operation and Development. (2014). OECD: Obestiy Update 2014. *OECD Health Statistics*, (June), 8. http://doi.org/10.1007/s11428-009-0404-2

Organization, W. H. (2015). Obesity and overweight. Retrieved 27 January 2016, from http://www.who.int/mediacentre/factsheets/fs311/en/

Oude, L. H., Baur L., Jansen H., Shrewsbury, V.A., O'Malley, C., Stolk, R.P., S. C. (2009). Interventions for treating obesity in children. *Cochrane Database Syst Rev*. http://doi.org/doi: 10.1002/14651858. CD001872.pub2.

Pai, H. L., & Contento, I. (2014). Parental perceptions, feeding practices, feeding styles, and level of acculturation of Chinese Americans in relation to their school-age child's weight status. *Appetite*, *80*, 174–182. http://doi.org/10.1016/j.appet.2014.04.029

Pallant, J. (2013). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS* (5th Editio). Berkshire: Mc Graw Hill.

Palmer, F., & Davis, M. C. (2014). Reliability and validity of the Parent Efficacy for Child Healthy Weight Behaviour (PECHWB) scale. *Child: Care, Health and Development*, *40*(3), 398–404. http://doi.org/ 10.1111/cch.12069

Patrick, H., Nicklas, T. A., Hughes, S. O., & Morales, M. (2005). The benefits of authoritative feeding style: caregiver feeding styles and children's food consumption patterns. *Appetite*, *44*(2), 243–249. http://doi.org/10.1016/j.appet.2002.07.001

Patrick, K., Marshall, S. J., Davila, E. P., Kolodziejczyk, J. K., Fowler, J. H., Calfas, K. J., … Robinson, T. N. (2014). Design and implementation of a randomized controlled social and mobile weight loss trial for young adults (project SMART). *Contemporary Clinical Trials*, *37*(1), 10–18. http://doi.org/10.1016/j.cct.2013.11.001

Pearson, N., Atkin, A. J., Biddle, S. J. H., & Gorely, T. (2010). A family-based intervention to increase fruit and vegetable consumption in adolescents: a pilot study. *Public Health Nutrition*, *13*(6), 876–85. http://doi.org/10.1017/S1368980010000121

Pérez-Escamilla, R., Obbagy, J. E., Altman, J. M., Essery, E. V., McGrane, M. M., Wong, Y. P., … Williams, C. L. (2012). Dietary Energy Density and Body Weight in Adults and Children: A Systematic Review. *Journal of the Academy of Nutrition and Dietetics*, *112*(5), 671–684. http://doi.org/10.1016/j.jand.2012.01.020

Perez, S. (2016). WhatsApp adds support for document sharing, but only PDFs at launch. Retrieved 21 December 2016, from https://techcrunch.com/2016/03/02/whatsapp-adds-support-for-document-sharing-but-only-pdfs-at-launch/

Pew Research Center. (2014). Social Media Update 2014. Retrieved 3 July 2014, from http://www.pewinternet.org/2015/01/09/social-media-update-2014/

Poh, Bee Koon; Nurul Jannah, A; Chong, Lai Khuen; Ruzita, Abd Talib; Mohd Noor, Ismail; McCarthy, D. (2011). Waist circumference percentile curves for Malaysian children and adolescents aged 6.0 – 16.9 years. *International Journal of Pediatric Obesity*, *Early onli*, 1–7. http://doi.org/10.3109/17477166.2011.583658

Poh, B. K., Ng, B. K., Haslinda, M. D. S., Shanita, S. N., Wong, J. E., Siti Balkis, B., … & Norimah, A. K. (2013). Nutritional status and dietary intakes of children aged 6 months to 12 years: findings of the Nutrition Survey of Malaysian Children (SEANUTS Malaysia). *British Journal of Nutrition*, *110*, S21–S35. http://doi.org/10.1017/ S0007114513002092

Poh, B. K., Tham, K. B. L., Wong, S. N., Chee, W. S. S., & Tee, E. S. (2012). Nutritional status, dietary intake patterns and nutrition knowledge of children aged 5-6 years attending kindergartens in the Klang Valley, Malaysia. *Malaysian Journal of Nutrition*, *18*(2), 231–242. http://doi.org/10.1017/S0007114513002092

Prina, S., & Royer, H. (2012). The importance of parental knowledge: Evidence from weight report cards in Mexico. Journal of Helath Economics, 37, 232-247.

Pulgarón, E. R. (2013). Childhood Obesity: A Review of Increased Risk for Physical and Psychological Comorbidities. *Clinical Therapeutics*. http://doi.org/10.1016/j.clinthera.2012.12.014

Rafidah, S. (2015). *Program pelaksanaan ujian standard kecergasan fizikal kebangsaan (SEGAK)*. Retrieved from http://dokumen.tips/documents/ kertas-kerja-segak-2015.html

Ranasinghe, C., Gamage, P., Katulanda, P., Andraweera, N., Thilakarathne, S., & Tharanga, P. (2013). Relationship between Body Mass Index (BMI) and body fat percentage, estimated by bioelectrical impedance, in a group of Sri Lankan adults: a cross sectional study. *BMC Public Health*, *13*(1), 797. http://doi.org/10.1186/1471-2458-13-797

Rasmussen, M., Krølner, R., Klepp, K.-I., Lytle, L., Brug, J., Bere, E., & Due, P. (2006). Determinants of fruit and vegetable consumption among children and adolescents: a review of the literature. Part I: Quantitative studies. *The International Journal of Behavioral Nutrition and Physical Activity*, *3*(1), 22. http://doi.org/10.1186/1479-5868-3-22

Reinehr, T., Schaefer, A., Winkel, K., Finne, E., & Kolip, P. (2011). Development and evaluation of the lifestyle intervention 'obeldicks light' for overweight children and adolescents. *Journal of Public Health*, *19*(4), 377–384. http://doi.org/10.1007/s10389-011-0410-x

Reinehr, T., Schaefer, A., Winkel, K., Finne, E., Toschke, A. M., & Kolip, P. (2010). An effective lifestyle intervention in overweight children: Findings from a randomized controlled trial on ' Obeldicks light'. *Clinical Nutrition*, *29*(3), 331–336. http://doi.org/10.1016/j.clnu.2009.12.010

Reinehr T, Schaefer A, Winkel K, Finne E, Toschke AM, K. P. (2010). An effective lifestyle intervention in overweight children: findings from a randomized controlled trial on 'Obeldicks light'. *Clin Nutr*, *29*(3), 331–336.

Rhee, K. E., De Lago, C. W., Arscott-Mills, T., Mehta, S. D., & Davis, R. K. (2005). Factors associated with parental readiness to make changes for overweight children. *Pediatrics*, *116*(1), e94–e101. http://doi.org/ 10.1542/peds.2004-2479

Robertson, W., Thorogood, M., Inglis, N., Grainger, C., & Stewart-Brown, S. (2012). Two-year follow-up of the 'Families for Health' programme for the treatment of childhood obesity. *Child: Care, Health and Development*, *38*(2), 229–236. http://doi.org/10.1111/j.1365-2214.2011.01237.x

Rodearmel, S. J., Wyatt, H. R., Barry, M. J., Dong, F., Pan, D., Israel, R. G., … Hill, J. O. (2006). A family-based approach to preventing excessive weight gain. *Obesity (Silver Spring)*, *14*(8), 1392–1401. http://doi.org/10.1038/oby.2006.158

Rolland-Cachera, M. F., Thibault, H., Souberbielle, J. C., Soulié, D., Carbonel, P., Deheeger, M., … & Serog, P. (2004). Massive obesity in adolescents: dietary interventions and behaviours associated with weight regain at 2 y follow-up. *International Journal of Obesity and Related Metabolic Disorders : Journal of the International Association for the Study of Obesity*, *28*(4), 514–9. http://doi.org/10.1038/sj.ijo.0802605

Rothert, K., Strecher, V. J., Doyle, L. a, Caplan, W. M., Joyce, J. S., Jimison, H. B., …& Roth, M. a. (2006). Web-based weight management programs in an integrated health care setting: a randomized, controlled trial. *Obesity (Silver Spring, Md.)*, *14*(2), 266–272. http://doi.org/10.1038/ oby.2006.34

Sabramani, V. A. L., Idris, I. B., Sutan, R., Isa, Z. M., Buang, S. N., & Ghazi, H. F. (2015). Managing obesity in malaysian schools: Are we doing the right strategies? *Malaysian Journal of Public Health Medicine*, *15*(2), 75–83.

Sacher, P. M, Kolotourou, M, Chadwick, P. M, Cole, Lawson, T. J., ... & Singhal, A. (2010). Randomized Controlled Trial of the MEND Program: A Family-based Community Intervention for Childhood Obesity. *Obesity*, *18*(1), S62–S67. Retrieved from file:///F:/Prof Lye/PHD-references/PHD-litrv-familybased/Sacher-mend study.html

Saidatul Norbaya, B. (2013). School Health Service. Retrieved from http://www.myhealth.gov.my/en/school-health-service/

Santos, J. L., Ho-Urriola, J. A, González, A., Smalley, S. V, Domínguez-Vásquez, P., Cataldo, R., … Hodgson, M. I. (2011). Association between eating behavior scores and obesity in Chilean children. *Nutrition Journal*, *10*(1), 108. http://doi.org/10.1186/1475-2891-10-108

Schulz, K.F., Chalmers, I., Hayes, R.J. & Altman, D. G. (1995). Empirical Evidence of Bias Dimensions of Methodological Quality Associated With Estimates of Treatment Effects in Controlled Trials. *JAMA*, *273*(5), 408–412. http://doi.org/doi:10.1001/jama.1995.03520290060030

Schwartz, R. P., Vitolins, M. Z., Case, L. D., Armstrong, S. C., Perrin, E. M., Cialone, J., & Bell, R. A. (2012). The YMCA Healthy, Fit, and Strong Program: a community-based, family-centered, low-cost obesity prevention/treatment pilot study. *Childhood Obesity (Print)*, *8*(6), 577–582. http://doi.org/10.1089/chi.2012.0060; 10.1089/chi.2012.0060

Shelton, D., Le Gros, K., Norton, L., Stanton-Cook, S., Morgan, J., & Masterman, P. (2007). Randomised controlled trial: A parent-based group education programme for overweight children. *Journal of Paediatrics and Child Health*, *43*(12), 799–805. http://doi.org/ 10.1111/j.1440-1754.2007.01150.x

Shloim, N., Edelson, L. R., Martin, N., & Hetherington, M. M. (2015). Parenting styles, feeding styles, feeding practices, and weight status in 4-12 year-old children: A systematic review of the literature. *Frontiers in Psychology*, *6*(DEC). http://doi.org/10.3389/fpsyg.2015.01849

Singh, G. M., Micha, R., Khatibzadeh, S., Lim, S., Ezzati, M., & Mozaffarian, D. (2015). Estimated global, regional, and national disease burdens related to sugar-sweetened beverage consumption in 2010. *Circulation*, *132*(8), 639–666. http://doi.org/10.1161/CIRCULATIONAHA.114.010636

Siwik, V., Kutob, R., Ritenbaugh, C., Cruz. L.,. Senf, J., Aickin, M., … &Shatte, A. (2013). Intervention in overweight children improves body mass index (BMI) and physical activity. *Journal of the American Board of Family Medicine*, *26*(2), 126–137. http://doi.org/10.3122/jabfm. 2013.02.120118

Skelton, J. A., & Beech, B. M. (2011). Attrition in paediatric weight management: A review of the literature and new directions. *Obesity Reviews*, *12*(5), e273–e281. http://doi.org/10.1111/j.1467-789X.2010. 00803.x

Skouteris, H., Mccabe, M., Swinburn, B., Newgreen, V., Sacher, P., & Chadwick, P. (2011). Parental influence and obesity prevention in pre-schoolers: A systematic review of interventions. *Obesity Reviews*, *12*(5), 315–328. http://doi.org/10.1111/j.1467-789X.2010.00751.x

Sleddens, E. F. C., Kremers, S. P. J., & Thijs, C. (2008). The children's eating behaviour questionnaire: factorial validity and association with Body Mass Index in Dutch children aged 6-7. *The International Journal of Behavioral Nutrition and Physical Activity*, *5*(1), 49. http://doi.org/10.1186/1479-5868-5-49

Sonneville, K. R., La Pelle, N., Taveras, E. M., Gillman, M. W., & Prosser, L. A. (2009). Economic and other barriers to adopting recommendations to prevent childhood obesity: results of a focus group study with parents. *BMC Pediatrics*, *9*, 81. http://doi.org/10.1186/1471-2431-9-81

Statista. (2013). Daily time spent with select media in Malaysia from 2007 to 2013 (in hours). Retrieved from https://www.statista.com/statistics/ 303524/time-spent-with-select-media-in-malaysia/

Statista. (2016). Malaysia - average fast food consumption per week | Survey 2016. Retrieved from https://www.statista.com/statistics/561279/ malaysia-average-fast-food-consumption-per-week/

Tabachnick, B.G. and Fidel, L. S. (2007). *Using Multivariate Statistics* (5th ed.). Boston: Allyn and Bacon Pearson Education, Inc.

Tate, D. F., Wing, R. R., & Winett, R. A. (2001). Using Internet technology to deliver a behavioral weight loss program. *Journal of the American Medical Association*, *285*(9), 1172–1177. http://doi.org/10.1001/ jama.285.9.1172

Technical Committee on Strategies for the Prevention of Obesity Malaysia. (2005). Recommended Prevention Strategies. *Strategy for the Prevention of Obesity: Malaysia*.

Torgerson, D. J. (2001). Contamination in trials: is cluster randomisation the answer? *BMJ (Clinical Research Ed.)*, *322*(7282), 355–357. http://doi.org/10.1136/bmj.322.7282.355

Torre, S. B. D., Keller, A., Depeyre, J., & Kruseman, M. (2016). Sugar-Sweetened Beverages and Obesity Risk in Children and Adolescents: A Systematic Analysis on How Methodological Quality May Influence Conclusions. *Journal of the Academy of Nutrition and Dietetics*, *116*(4), 638–659. http://doi.org/10.1016/j.jand.2015.05.020

Tovar, A., Hennessy, E., Pirie, A., Must, A., Gute, D. M., Hyatt, R. R., … Economos C. D. (2012). Feeding styles and child weight. *International Journal of Behavioral Nutrition & Physical Activity*, 1–8.

U.S. Department of Health and Human Services Centers for Disease Control and Prevention. Office of the Director, Office of Strategy and Innovation. (2011). Introduction to Program Evaluation for Public Health Programs : A Self-Study Guide, (October), 1–100.

Ulijaszek, S. J., & Kerr, D. A. (1999). Review article Anthropometric measurement error and the assessment of nutritional status, *44*(1999), 165–177.

Urbaniak, G. C., & Plous, S. (2007). Research randomizer. Retrieved 11 February 2015, from https://www.randomizer.org/

Van der Bijl & Shortridge-Baggett. (2001). The theory and measurement of the self-efficacy construct. *Sch Inq Nurs Pract*, *15*(3), 189–207.

Van Der Horst, K., Kremers, S., Ferreira, I., Singh, A., Oenema, A., & Brug, J. (2007). Perceived parenting style and practices and the consumption of sugar-sweetened beverages by adolescents. *Health Education Research*, *22*(2), 295–304. http://doi.org/10.1093/her/cyl080

Van Lippevelde, W., Bere, E., Verloigne, M., Van Stralen, M. M., De Bourdeaudhuij, I., Lien, N., … Maes, L. (2014). The role of family-related factors in the effects of the UP4FUN school-based family-focused intervention targeting screen time in 10- to 12-year-old children: the ENERGY project. *BMC Public Health*, *14*, 857. http://doi.org/10.1186/1471-2458-14-857

Viana, V., Sinde, S., & Saxton, J. C. (2008). Children's Eating Behaviour Questionnaire: associations with BMI in Portuguese children. *Br J Nutr*, *100*(2), 445–450. http://doi.org/10.1017/S0007114508894391

Vollmer, R. L., & Mobley, A. R. (2013). Parenting styles, feeding styles, and their influence on child obesogenic behaviors and body weight. A review. *Appetite*, *71*, 232–241. http://doi.org/10.1016/j.appet.2013.08.015

Wafa, S. W., Talib, R. A., Hamzaid, N. H., McColl, J. H., Rajikan, R., Ng, L. O., … Reilly, J. J. (2011). Randomized controlled trial of a good practice approach to treatment of childhood obesity in Malaysia: Malaysian Childhood Obesity Treatment Trial (MASCOT). *International Journal of Pediatric Obesity*, *6*(2–2), e62–e69. http://doi.org/10.3109/ 17477166.2011.566340

Wahi, G., Parkin, P. C., Beyene, J., Uleryk, E. M., & Birken, C. S. (2011). Effectiveness of Interventions Aimed at Reducing Screen Time in Children A Systematic Review and Meta-analysis of Randomized Controlled Trials. *Archives of Pediatrics & Adolescent Medicine*, *165*(11), 979–986. http://doi.org/10.1001/archpediatrics.2011.122

Wang, Y., Wu, Y., Wilson, R. F., Bleich, S., Cheskin, L., Weston, C., … Segal, J. (2013). Childhood Obesity Prevention Programs: Comparative Effectiveness Review and Meta-Analysis. *Comparative Effectiveness Reviews*, (115). Retrieved from http://www.ncbi.nlm.nih.gov/books/ PMH0057623/%5Cnhttp://www.ncbi.nlm.nih.gov/pubmed/23865092

Wang JJ, Wang HJ, Liu JS, M. J. (2013). The association between body mass index, waist circumference with body fat percent, and abdominal fat rate in overweight and obese pupils. *Zhonghua Yu Fang Yi Xue Za Zhi*, *47*(7), 603–607. Retrieved from https://www.ncbi.nlm.nih.gov/ pubmed/24304951

Wardle, J., Guthrie, C. A, Sanderson, S., & Rapoport, L. (2001). Development of the Children's Eating Behaviour Questionnaire. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *42*(7), 963–970. http://doi.org/10.1111/1469-7610.00792

Watkins, M. W. (2005). Monte Carlo PCA for parallel analysis. Retrieved from https://www.macupdate.com/app/mac/22303/monte-carlo-pca-for-parallel-analysis#

Webb, T. L., Joseph, J., Yardley, L., & Michie, S. (2010). Using the internet to promote health behavior change: a systematic review and meta-analysis of the impact of theoretical basis, use of behavior change techniques, and mode of delivery on efficacy. *Journal of Medical Internet Research*, *12*(1), 1–18. http://doi.org/10.2196/jmir.1376

Wen, C. P., David Cheng, T. Y., Tsai, S. P., Chan, H. T., Hsu, H. L., Hsu, C. C., & Eriksen, M. P. (2009). Are Asians at greater mortality risks for being overweight than Caucasians? Redefining obesity for Asians. *Public Nealth Nutrition*, *12*(4), 497–506. http://doi.org/10.1017/ S1368980008002802

West, F. & Sanders, M. R. (2009). The Lifestyle Behaviour Checklist: a measure of weight-related problem behaviour in obese children. *Int J Pediatr Obes*, *4*(4), 266–273. http://doi.org/10.3109/17477160902 811199

West, F., Sanders, M. R., Cleghorn, G. J., & Davies, P. S. W. (2010). Randomised clinical trial of a family-based lifestyle intervention for childhood obesity involving parents as the exclusive agents of change. *Behaviour Research and Therapy*, *48*(12), 1170–1179. http://doi.org/10.1016/j.brat.2010.08.008

Wilfley, D. E., Stein, R. I., Saelens, B. E., Matt, G. E., Hayden-wade, H. A, Welch, R. R., … Epstein, L. H. (2007). Efficacy of Maintenance Treatment. *The Journal of the American Medical Association*, *298*(14), 1661–1673.

Williamson, D. A, Walden, H. M., White, M. A, York-Crowe, E., Newton, R. L., Alfonso, A., … Ryan, D. (2006). Two-year internet-based randomized controlled trial for weight loss in African-American girls. *Obesity (Silver Spring, Md.)*, *14*(7), 1231–1243. http://doi.org/10.1038/oby.2006.140

Winett, R. A., Tate, D. F., Anderson, E. S., Wojcik, J. R., & Winett, S. G. (2005). Long-term weight gain prevention: A theoretically based Internet approach. *Preventive Medicine*, *41*(2), 629–641. http://doi.org/10.1016/j.ypmed.2004.12.005

World Health Organization. (2003). Increasing fruit and vegetable consumption to reduce the risk of noncommunicable diseases. Retrieved from http://www.who.int/elena/titles/fruit_vegetables_ncds/en/

World Health Organization. (2006). WHO Anthroplus. Retrieved 6 March 2015, from http://en.freedownloadmanager.org/Windows-PC/WHO-AnthroPlus-FREE.html

World Health Organization. (2007). Growth reference data for 5-19 years. Retrieved 14 January 2014, from http://www.who.int/growthref/en/

World Health Organization. (2008). Waist Circumference and Waist-Hip Ratio: Report of a WHO Expert Consultation. *World Health Organization*, (December), 8–11. http://doi.org/10.1038/ejcn.2009.139

World Health Organization. (2014). Facts and figures on childhood obesity. Retrieved from http://www.who.int/end-childhood-obesity/facts/en/

World Health Organization. (2015). Information note about intake of sugars recommended in the WHO guideline for adults and children. Retrieved from http://www.who.int/about/licensing/copyright_form/en/index.html

World Health Organization. (2015). Interim Report of the Commission on Ending Childhood Obesity. *World Health Organization*, 1–30. http://doi.org/ISBN 978 92 4 151006 6

World Health Organization (WHO). (2000). Obesity: preventing and managing the global epidemic. Report of a WHO consultation. *World Health Organization Technical Report Series*, *894*, i–xii, 1-253. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11234459

World Heath Organization. (2016). Obesity and overweight. Retrieved 23 December 2016, from http://www.who.int/mediacentre/factsheets/ fs311/en/

World Heath Organization. (2017). Commission on ending childhood obesity: Facts and figures on childhood obesity. Retrieved 14 June 2017, from http://www.who.int/end-childhood-obesity/facts/en/

Wright, J. A, Adams, W. G., Laforge, R. G., Berry, D., & Friedman, R. H. (2014). Assessing parental self-efficacy for obesity prevention related behaviors. *The International Journal of Behavioral Nutrition and Physical Activity*, *11*(53), 1–9. http://doi.org/10.1186/1479-5868-11-53

Xu, H., Wen, L. M., & Rissel, C. (2015). Associations of parental influences with physical activity and screen time among young children: A systematic review. *Journal of Obesity*, *2015*. http://doi.org/ 10.1155/2015/546925

Sze, Y. Y., Daniel, T. O., Kilanowski, C. K., Collins, R. L. & Epstein, L. H. (2017). Web-Based and Mobile Delivery of an Episodic Future Thinking Intervention for Overweight and Obese Families: A Feasibility Study. *Journal of Medical Internet Research*, *3*(4). Retrieved from http://mhealth.jmir.org/2015/4/e97/

Yang, Y. J., Kim, M. K., Hwang, S. H., Ahn, Y., Shim, J. E., & Kim, D. H. (2010). Relative validities of 3-day food records and the food frequency questionnaire. *Nutrition Research and Practice*, *4*(2), 142–8. http://doi.org/10.4162/nrp.2010.4.2.142

Yen, S. T., Tan, A. K. G., & Feisul, M. I. (2012). Consumption of Fruits and Vegetables in Malaysia: Profiling the Daily and Nondaily Consumers. *Asia-Pacific Journal of Public Health / Asia-Pacific Academic Consortium for Public Health*, *27*(2), NP2635-50. http://doi.org/10.1177/ 1010539512458523

Yen, W. C., Shariff, Z. M., Kandiah, M., & Taib, M. N. M. (2014). Stages of change to increase fruit and vegetable intake and its relationships with fruit and vegetable intake and related psychosocial factors. *Nutrition Research and Practice*, *8*(3), 297–303. http://doi.org/10.4162/ nrp.2014.8.3.297

Zimmerman, F. J., & Bell, J. F. (2010). Associations of television content type and obesity in children. *American Journal of Public Health*, *100*(2), 334–340. http://doi.org/10.2105/AJPH.2008.155119