UNIVERSITI PUTRA MALAYSIA

EARLY LIFE FACTORS ON CHILDHOOD OVERWEIGHT AND OBESITY AMONG PRESCHOOLERS IN PUTRAJAYA, 2017

FATIMAH AHMAD FAUZI

FPSK(M) 2017 26

EARLY LIFE FACTORS ON CHILDHOOD OVERWEIGHT AND OBESITY AMONG PRESCHOOLERS IN PUTRAJAYA, 2017

By

FATIMAH AHMAD FAUZI

Dissertation Submitted to the Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Public Health

August 2017

Abstract of dissertation presented to the Department of Community Health, Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Public Health

EARLY LIFE FACTORS ON CHILDHOOD OVERWEIGHT AND OBESITY AMONG PRESCHOOLER IN PUTRAJAYA, 2017

By

FATIMAH AHMAD FAUZI

August 2017

Chairman: Assoc. Prof. Dr. Nor Afiah Mohd Zulkefli
Faculty: Medicine and Health Sciences

Background: Childhood obesity is becoming a global epidemic in this new era. According to WHO, the number of overweight children under the age of five in 2014 worldwide is estimated to be over 42 million and more than 70% of them are living in developing countries. Similar problem faced in Malaysia as being labelled as the fattest population in South East Asia.

Objectives: To determine the early life factors that contribute to childhood overweight and obesity among preschoolers in Putrajaya in 2017, which include sociodemographic factors, pre-and perinatal factors, infant feeding and weaning practices, early child care, family structure and parental behaviors, and psychosocial factors.

Methodology: A cross sectional study was conducted by cluster random sampling among 897 preschool students from all registered preschools in Putrajaya. Anthropometry measurements of body weight and height measurements were performed on the preschoolers and questionnaires were distributed to the mothers. Calculated BMI was used to determine child's overweight and obesity status following BMI-for-age z-scores of WHO Growth Standards 2006 and WHO Growth Reference 2007.

Results: The sample comprised of 897 children, with a mean age of 5.4 ± 0.58 years. The prevalence of overweight and obese children was 7.3%, which can be predicted with elder child's age (AOR: 2.595; 95%CI: 1.281 – 5.254), higher mother's education level (AOR: 4.909; 95%CI: 1.065 – 22.621), higher maternal BMI (AOR: 1.122; 95%CI: 1.034 – 1.219), and unknown caregiver's education status (AOR: 2.907; 95%CI: 1.144 – 7.386).

Conclusion: Four early life factors can be predicted with childhood overweight and obesity among preschoolers in Putrajaya, which included in three domain of early life factors of socio-demographic, pre-and perinatal, and early childcare.

Keywords: childhood overweight, childhood obesity, early life factors, preschool

Abstrak disertasi yang dikemukakan kepada Jabatan Kesihatan Komuniti, Fakulti, Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Sarjana Kesihatan Awam

FAKTOR AWAL KEHIDUPAN TERHADAP KEGEMUKAN DAN OBESITI DARIPADA KALANGAN KANAK-KANAK PRA SEKOLAH DI PUTRAJAYA, 2017.

Oleh

FATIMAH AHMAD FAUZI

Ogos 2017

Pengerusi: Prof Madya Dr Nor Afiah Mohd Zulkefli
Fakulti: Perubatan dan Sains Kesihatan

Latar Belakang: Masalah obesiti di kalangan kanak-kanak pada era masa kini telah menjadi wabak global yang serius. Mengikut WHO, jumlah kanak-kanak yang berlebihan berat badan di bawah umur lima tahun di serata dunia dianggarkan lebih daripada 42 juta orang, manakala lebih daripada 70% daripada mereka tinggal di negara-negara yang sedang membangun. Dilabelkan sebagai masyarakat yang tergemuk di Asia Tenggara, Malaysia juga antara negara-negara membangun yang mengalami masalah yang sama.

Objektif: Untuk menilai faktor awal kehidupan yang boleh menyumbang kepada kegemukan dan obesiti di kalangan kanak-kanak pra sekolah di Putrajaya, 2017. Ini termasuk faktor sosiodemografi, sebelum dan semasa bersalin, pemakanan dan penceraian susu bayi, penjagaan awal kanak-kanak, struktur keluarga dan sikap ibu bapa, dan faktor psikososial.

Kaedah: Satu kajian rentas telah dibuat berdasarkan persampelan rawak kluster dikalangan 897 kanak-kanak pra sekolah di semua pra sekolah yangberdaftar di Putrajaya. Pengukuran tinggi dan berat badan terhadap kanak-kanak tersebut telah dijalankan dan borang soal selidik telah diedarkan kepada ibu kanak-kanak tersebut. Pengiraan BMI digunakan untuk menentukan status kegemukan dan obesiti di kalangan kanak-kanak berdasarkan BMI-untuk-umur z-skor Pertumbuhan Piawai WHO 2006 dan Pertumbuhan Rujukan WHO 2007.

Keputusan: Responden adalah di kalangan kanak-kanak yang berjumlah 897 orang, dengan purata umur 5.4 ±0.58 tahun. Kelaziman kegemukan dan obesiti di kalangan kanak-kanak tersebut adalah 7.3%. Ianya boleh diramalkan dengan unur kanak-kanak

yang lebih tua (AOR: 2.595; 95%CI: 1.281 – 5.254), status pendidikan ibu yang lebih tinggi (AOR: 4.909; 95%CI: 1.065 – 22.621), BMI ibu yang lebih tinggi ketika mengandung (AOR: 1.122; 95%CI: 1.034 – 1.219), dan status pendidikan penjaga kanak-kanak yang tidak diketahui (AOR: 2.907; 95%CI: 1.144 – 7.386).

Kesimpulan: Empat faktor awal kehidupan yang boleh meramalkan kegemukan dan obesiti di kalangan kanak-kanak pra sekolah di Putrajaya. Ianya termasuk dalam tiga domain faktor iaitu sosio demografi, sebelum dan semasa bersalin, dan penjagaaan awal kanak-kanak.

Kata Kunci: kegemukan kanak-kanak, obesiti kanak-kanak, faktor awal kehidupan, prasekolah

ACKNOWLEDGEMENTS

All praise to The Almighty for allowing me to execute the study within my own capability. I would also like to express my heartfelt gratitude to my supervisor, A.P. Dr Nor Afiah Mohd Zulkefli for her endless advice, guidance, and support throughout my research.

High appreciation also for me to convey to all owners/teachers of the involved preschool in Putrajaya for this study. This also include the related authority for the approval of my study to be conducted in respective preschools, which are Education Planning and Research Division of Ministry of Education Malaysia (BPSH), Department of State Education Putrajaya (JPWP), Community Development Department (KEMAS) of Ministry of Rural and Regional, Department of National Unity and Integration (PERPADUAN) of Prime Minister Department, and Federal Territory Islamic Religious Council (MAIWP).

Special thanks also to my dearest assistant, Dr Nur Farah Afiqah, for helping me out in this research, and to Dr Nurzalinda Zalbahar from Department of Nutrition and Dietetics, Universiti Putra Malaysia, for the professional advice and opinion. As for my other lecturers and colleagues who have contributed ideas and suggestions into making this research a successful, thank you for the support and encouragements.

Last but not least, a special thank you to my beloved husband, my family, and my two little ones for their continuous prayers, patience, sacrifices and support that made this research meaningful and possible.

I certify that a Thesis Examination Committee has met on 1st August 2017 to conduct the final examination of Fatimah ahmad Fauzi on her thesis entitled "Early Life Factors Associated with Chldhood Overweight and Obesity Among Preschoolers in Putrajaya, 2017) 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 Master of Public Health.

Members of the Dissertation Examination Committee were as follows:

Dr. Suhainizam bin Muhamad Saliluddin
MB,BCh,BAO (Ireland);MPH (OH) (UM)
Senior Lecturer (Medical)
Department of Community Health
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Chairman)

Dr. Rosliza binti Abdul Manaf
MBBS(UM), Master of Community Medicine(UKM), PhD (Otago)
Senior Lecturer (Medical)
Department of Community Health
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Internal Examiner)

Assoc. Prof. Dr. Rosnah Sutan
MD (USM), MPH (UM), Ph.D. (Aberdeen), SRH postdoctoral cert.(WHO/GFMER)
Department of Community Health
Medical Faculty
Universiti Kebangsaan Malaysia
(External Examiner)

_____
Professor Dato' Dr. Abdul Jalil Nordin,
DSIS MD (UKM). MMed. (Radiologi-UM)
Professor and Dean
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia

Date:

This dissertation was submitted to the Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, and has been accepted as fulfilment of the requirement for the degree of Master of Public Health. The member of the Supervisory Committee was as follows:

Dr. Nor Afiah binti Mohd Zulkefli
B.Med.Sc (UKM), MD (UKM), M.Comm.Health (Family Health) (UKM), PhD (UKM)
Associate Professor
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Chairman)

_____
Professor Dato' Dr. Abdul Jalil Nordin,
DSIS MD (UKM). MMed. (Radiologi-UM)
Professor and Dean
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia

Date:

Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

Signature:_____

Name of
Chairman of
Supervisory Committee:Assocciate Professor Dr. Nor Afiah binti Mohd Zulkefli

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

BMI	Body Mass Index
CI	Confidence Interval
IQR	Interquartile Range
KEMAS	Jabatan Kebajikan Masyarakat
MOH	Ministry of Health
NHMS	National Health Morbidity Survey
SD	Standard Deviation
SE	Standard Error
SVD	Spontaneous Vaginal Delivery
TV	Television
VIF	Variation Inspection Factor
WHO	World Health Organization
YOL	Years of Life
≥	Greater than or equal to
≤	Lesser than or equal to
>	Greater than
<	Lesser than
±	Plus and minus of

CHAPTER 1

INTRODUCTION

1.1 Background

Childhood obesity is defined by the World Health Organization as "excessive fat accumulation that may impair health among children" (World Health Organization, 2016). It is considered as one of the most serious public health challenges in this 21st century. Though it was previously known as vulgar among adults but the rising of the prevalence of overweight and obesity among the children and adolescent is alarming and becoming epidemic globally. The highest prevalence rates of childhood obesity have been observed in developed countries such as United States and Europe countries but its prevalence in developing countries has shown increasing trend over the past few years (Mahshid, Noori & Anwar, 2005). As from the worldwide estimate on the number of overweight children under-five years of age in 2014, it was estimated to be over 42 million and more than 70 percent of them are living in developing countries. In the same year, the number of children who were overweight and obese had nearly doubled to 10.6 million in Africa from 1990. As in Asia, nearly half of the overweight and obese children under-five in 2014 were living in the region (WHO, 2016). The increasing trend of child obesity can also be observed in Malaysia, in which three times increased in the prevalence of child obesity within four years since 2011 (Ministry of Health, 2011;2015).

Evidence has shown the relationship of childhood obesity and adult obesity. Children who are obese after six years of age are at risk of remaining as obese adults with probability exceeds 50% (Segal & Sanchez, 2001). This may affect their immediate health, educational achievement, and quality of life as they may also at risk of developing chronic illness related to obesity (WHO, 2016).

One of the key factors contributing to childhood obesity is the obesogenic environment where the children are living nowadays (Brownell, 2004). High saturated fat dietary consumption coupled with reduced physical activity and sedentary behaviors result in energy imbalance and encourage weight gain and obesity (Sherina & Rozali, 2004). In addition, there are three critical periods in the life-course of a child which are also needed to be looked upon: preconception and pregnancy; infancy and early childhood; and older childhood and adolescence (WHO, 2016). The first 2 life-courses are considered as early life and the early life risk factors of childhood obesity are currently being researched as part in planning for the early prevention in combating childhood obesity (Koletzko et al., 2009).

Many putative early life factors studied can be associated with child overweight and obesity including parental obesity, adiposity rebound and weight gain in early years of life, screen time, and reduced sleep duration (Reilly et al, 2005). This warrant for further research on this matter as part of the efforts in achieving part of the second Sustainable Development Goal in improving the worldwide nutrition.

1.2 Impact of Childhood Obesity

Previously, obesity related non-communicable diseases are thought to be associated among adults only. This shouldn't be the case as the outcomes may affecting the children as well include metabolic syndromes (OR: 1.55, 95% CI: 1.16 – 2.08), which comprised of Diabetes Mellitus Type II, hypertension, and dyslipidemia (Weiss, Dziura, Burgert, Tamborlane, & Taksali, 2004).

Based on a twenty years' longitudinal study done in United States, overweight or obesity developed in childhood and adolescent is significantly related to subsequent overweight or obesity in adulthood, which increased with age. The probability of adult obesity for those with BMI at 95th percentile during childhood or adolescent was less than 20% from three to four years of age and increased to 40 – 59.9% from 12 to 17 years of age (Guo, Wu, Chumlea, & Roche, 2002). This may be related to insulin resistance development in obesity child, which may also be associated to long term vascular complications in adult example coronary heart disease with relative risk mortality of 2.3 (95% CI: 1.4 – 4.1) in men (Must, Jacques, Dallal, Bajema, & Dietz, 1992).

Other diseases which may be resulted from childhood obesity are new onset bronchial asthma (RR: 1.60; 95% CI: 1.08, 2.36) (Gilliland et al., 2003), hypertension (Sorof, Poffenbarger, Franco, Bernard, & Portman, 2002), obstructive sleep apnea, and orthopaedics problems for example slipped capital-femoral epiphysis (Sorof & Daniels, 2002). Obesity may not be independently cause these illnesses, but the precipitating factors from the environment and social factors which result in obesity to become an important factor to be looked upon as part of the diseases development.

Apart from that, psychosocial problems among children are also very important threat in children with obesity. Adolescent may be the period of greatest risk to suffer from psychological disturbance as they may consider themselves as significant 'handicapped' (WHO, 2000). The association between obesity and poor mental health such as depression can be bi-directional, in which adolescence with obesity may lead to depression in adulthood, while adolescent depressive symptoms may result in adult obesity later on (Gatineau & Dent, 2011). Based on a study done in 4703 Swedish adolescents, those with many encounters of disgrace had an increased risk (OR: 11.3; 95% CI: 8.3–14.9) to develop depression (Sjoberg, Nilsson, & Leppert, 2005).

Obese children should be evaluated for associated morbidity as they can develop similar complications as for adult like early onset Type 2 Diabetes Mellitus. This is due to strong association of obesity with insulin resistance, accompanied by relative insulin deficiency. As adverse health effects, children and adolescents with Type 2 Diabetes Mellitus may experience the macrovascular and microvascular complications of the disease earlier as compared to those who develop diabetes later in adulthood. This include atherosclerotic cardiovascular disease, myocardial infarction, stroke, renal impairment, limb-threatening neuropathy, vasculopathy, and retinopathy(Hannon, Rao, & Arslanian, 2015).

On top of the health impacts, childhood obesity will also affect economically directly through medical costs expenditure, and indirectly such as job absenteeism and lower productivity (Cawley, 2010). Based on surveys done in United States, the estimated direct costs of childhood obesity outpatient costs which include annual prescription drug, emergency room is $14.1 billion (Trasande & Chatterjee, 2009) plus inpatient costs of $237.6 million (Trasande, Liu, Fryer, & Weitzman, 2009). Higher cost is incurred if obese children developed into obese adults as the cost of treating obesity-related illness in adults can be overwhelming.

1.3 Prevention and Intervention on Childhood Obesity

The key plan in curbing the developing epidemic of childhood obesity is to enhance the primary and secondary prevention, which are seemed to more effective in children than in adults (Mahshid, Noori & Anwar, 2005). These strategies can be achieved through various kind of interventions aiming built environment, physical activity, and dietary practice.

Identifying and changing the obesogenic environment may requires cooperation and multi-angle approaches from the community. Creating a neighborhood with recreation facilities for outdoor and physical activities is part of built environment in overcoming obesity (Mahshid, Noori, & Anwar T, 2005). Apart from that, screen time control among the children must be implemented at home by parents as screen time is associated with BMI in children (Lee et al., 2015).

The efforts in overcoming childhood obesity in Malaysia has been started even in the early 90s where the Ministry of Education of Malaysia has launched The Healthy Lifestyle Campaign among pupils and school personnel in promoting healthy school living. Another successions of activities are The Healthy Eating Campaign (1997–2002), on food and dietary practices, nutrition labeling, body weight management, and food hygiene (Nidhi, Kashish, Priyali, & Anoop, 2016).

Recently in 2014, a school-based intervention program (My Body is Fit and Fabulous, My BFF) has been implemented by the Ministry of Health Malaysia with the cooperation of the Ministry of Education in curbing the high prevalence of childhood obesity in Malaysia. This program focusing on structured physical activity and improving the school children knowledge, self-esteem and self-empowerment (Vikneswaran et al., 2015).

Many interventions targeting on physical activities and dietary intake among school children have been done and some of them showed significant improvements in the BMI of the participants (Meng et al., 2013). The subsequent question is: can it be sustained even after the intervention has stopped? Based on a systematic reviewed randomized clinical trials on intervention on childhood obesity among children aged six to twelve years old, there were significant differences in the outcomes assessed in treatment studies, not in prevention studies (Sbruzzi et al., 2013).

At present, many researchers are looking into the early factors which contribute to childhood obesity so that early primary prevention could be implemented, even on pregnant mothers (Watt, Appel, Roberts, Flores, & Morris, 2013). This is because once obesity already established, it is challenging to treat as multiple physiological, behavioral and socio-cultural influence need to be considered (Gillman & Ludwig, 2013).

1.4 Problem Statement

The accelerating prevalence of childhood overweight and obesity in many parts of the world has become one of the major public health concern (Ogden et al, 2006). In developed and developing countries, the increment prevalence of overweight and obesity among preschool children were 48% and 65% respectively from 1990 until 2010 (de Onis, Blossner, & Borghi, 2010). With the status of an upper middle-income country, Malaysia also not being excluded from facing similar problem of growing child overweight and obesity as statistics shows that the prevalence of obesity in children less than 18 years old has tripled from 3.9% (0.3 million) in 2011 to 11.9% (1.0 million) in 2015 (Ministry of Health Malaysia, 2011; Ministry of Health Malaysia, 2015). As ranked to be the fattest country in South-East Asia and the sixth in the Asia-Pacific region (Ng et al., 2014), Malaysia issues on overweight and obesity is considered as a national issue and further escalation on child overweight and obesity should be avoided if the nation development and healthy well- being needed to be preserved.

Apart from at increased risk of becoming overweight and obese adult, overweight and obese child will further at risk to develop related non-communicable diseases such as Diabetes Mellitus Type II, hypertension, and dyslipidemia (Weiss et al., 2004). Diabetes Mellitus and cardiovascular diseases are part of the main four non-communicable diseases which contribute to the high mortality between ages 30 and 70 years as the probability of dying prematurely is 20% (WHO, 2014). Furthermore, overweight and obese children may be affected with mental health disorder such as depression as the result of low self-esteem, body dissatisfaction, lower physical activity, and social stigma (Gatineau & Dent, 2011). These related non-communicable diseases with childhood overweight and obesity will further result in economic burden for a country with increasing financial costs of the treatment of its complications, and increased disability-adjusted life-years (DALYs), which can be overwhelming particularly in developing countries (Parvez, Bisher, & Meguid, 2007).

1.5 Significance of Study

Early childhood development which comprised of the gestational development up to eight years of age are considered as the critical period of child development of obesity (Irwin, Arjumand, & Hertzman, 2007). For example, the early development of excess adiposity in infancy is influenced by the establishment of eating habits and food transitions (J. Zhang et al., 2013).

Up to present, there has been no universally effective preventive strategies or management for reducing obesity prevalence among children in the community and primary health care (Zhang et al., 2013). Many efforts and resources have been invested

and channeled in various programs to combat this issues of overweight and obesity, which mainly focusing on dietary habits and physical activity such as Global Strategy on Diet, Physical Activity and Health 2004, Aerobic Exercise Program, and Outline on the Management of a Healthy Canteen (Vikneswaran et al., 2015). Therefore, it becomes of utmost importance to prevent childhood overweight and obesity at the earlier stage, requiring the evaluation of associations between early modifiable risk factors and overweight and obesity status in their early lives (Zhang et al., 2013). In that case, the application of these early life factors associated with childhood overweight and obesity can be implemented in formatting new and more effective preventive and control strategies for childhood overweight and obesity.

According to National Health and Morbidity Survey of Malaysia (NHMS) 2015, Putrajaya has been labeled as the city with the highest percentage (43%) of overweight, obesity and abdominally obese people in the country (MOH, 2015). As for children, a study conducted by the Nutrition Society of Malaysia in 2010 in Kuala Lumpur, Putrajaya, and Selangor showed that 14.5% children aged one to three years old were overweight and 16.6% children aged four to six years old were overweight (Tee, 2011).

This worrying situation should be prevented earlier at children level as the rates of childhood overweight and obesity are also increasing. The growing prevalence of child overweight and obesity in Putrajaya should be prevented as to hinder from additional increment in the prevalence of overweight and obesity among adults in the future. As for that, a background study on the early life factors on childhood overweight and obesity among preschoolers in Putrajaya is prudent to explore the possible relations of adult and child overweight and obesity, in the hope of dampening the rising statistics of overweight and obesity in the area. Furthermore, this study may fill in some of the research gaps in the region related to determine the early life factors associated with childhood overweight and obesity.

1.6 Research Questions

1.1.1 What is the prevalence of overweight and obesity among preschoolers in Putrajaya in 2017?

1.1.2 What are the early life factors that affect childhood overweight and obesity among preschoolers in Putrajaya in 2017?

1.1.3 Is there any association between the early life factors and the prevalence of overweight and obesity among preschoolers in Putrajaya in 2017?

1.1.4 What are the early life predictors on childhood overweight and obesity among preschoolers in Putrajaya in 2017?

1.7 Objectives

1.7.1 General Objective

To determine the early life factors that contribute to childhood overweight and obesity among preschoolers in Putrajaya in 2017.

1.7.2 Specific objectives

i. To determine prevalence of childhood overweight and obesity among preschoolers in Putrajaya.
ii. To determine socio-demographic factors among preschoolers and their mothers in Putrajaya.
iii. To determine the pre-and perinatal factors, feeding and weaning practices, early child care, family structure and parental behaviors, and psychosocial factors in the first two years of life among preschoolers in Putrajaya.
iv. To determine the association between socio-demographic factors and childhood overweight and obesity among preschoolers in Putrajaya.
v. To determine the association between pre-and perinatal factors and childhood overweight and obesity among preschoolers in Putrajaya.
vi. To determine the association between feeding and weaning practices in the first two years of life and childhood overweight and obesity among preschoolers in Putrajaya.
vii. To determine the association between early child care in the first two years of life and childhood overweight and obesity among preschoolers in Putrajaya.
viii. To determine the association between family structure and parental behaviors in the first two years of life and childhood overweight and obesity among preschoolers in Putrajaya.
ix. To determine the association between psychosocial factors among parents in the first two years of life and childhood overweight and obesity among preschoolers in Putrajaya.
x. To determine the predictors of childhood overweight and obesity among preschoolers in Putrajaya.

1.8 Research Hypotheses

H_1: There is a significant association between socio-demographic factors and childhood overweight and obesity among preschoolers in Putrajaya.

H_2: There is a significant association between pre-and perinatal factors and childhood overweight and obesity among preschoolers in Putrajaya.

H_3: There is a significant association between feeding and weaning practices and childhood overweight and obesity among preschoolers in Putrajaya.

H_4: There is a significant association between early child care and childhood overweight and obesity among preschoolers in Putrajaya.

H_5: There is a significant association between family structure and parental behaviors and childhood overweight and obesity among preschoolers in Putrajaya.

H_6: There is a significant association between psychosocial factors among parents and childhood overweight and obesity among preschoolers in Putrajaya.

BIBLIOGRAPHY

Apfelbacher, C. J., Loerbroks, A., Cairns, J., Behrendt, H., Ring, J., & Krämer, U. (2008). Predictors of overweight and obesity in five to seven-year-old children in Germany: results from cross-sectional studies. *BMC Public Health*, *8*(1), 171.

Arenz, S., Rückerl, R., Koletzko, B., & von Kries, R. (2004). Breast-feeding and childhood obesity--a systematic review. *International Journal of Obesity and Related Metabolic Disorders : Journal of the International Association for the Study of Obesity*, *28*(10), 1247–1256. http://doi.org/10.1038/sj.ijo.0802758

Bammann, K., Peplies, J., De Henauw, S., Hunsberger, M., Molnar, D., Moreno, L. A., … Siani, A. (2014). Early life course risk factors for childhood obesity: The IDEFICS case-control study. *PLoS ONE*, *9*(2), 1–7. http://doi.org/10.1371/journal.pone.0086914

Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., De Onis, M., … Uauy, R. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, *382*(9890), 427–451. http://doi.org/10.1016/S0140-6736(13)60937-X

Brophy, S., Cooksey, R., Gravenor, M. B., Mistry, R., Thomas, N., Lyons, R. A., & Williams, R. (2009). Risk factors for childhood obesity at age 5: analysis of the millennium cohort study. *BMC Public Health*, *9*, 467. http://doi.org/10.1186/1471-2458-9-467

Cappa, C. (2014). *The formative years: UNICEF's work on measuring early childhood development*. Retrieved from http://www.unicef.org/earlychildhood/files/Brochure_-_The_Formative_Years.pdf

Cawley, J. (2010). The economics of childhood obesity. *Health Affairs*, *29*(3), 364–371. http://doi.org/10.1377/hlthaff.2009.0721

Cole, T. J., Bellizzi, M. C., Flegal, K. M., & Dietz, W. H. (2000). Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ (Clinical Research Ed.)*, *320*(7244), 1240–3. http://doi.org/10.1136/bmj.320.7244.1240

de Onis, M., Blossner, 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

Demment, M. M., Haas, J. D., & Olson, C. M. (2014). Changes in family income status and the development of overweight and obesity from 2 to 15 years: a longitudinal study. *BMC Public Health*, *14*(1), 417. http://doi.org/10.1186/1471-2458-14-417

Department of Statistics Malaysia. (2016). *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

Department of Statistics Malaysia. (2016). *Report of Household Income and Basic Amenities Survey 2014*. Retrieved from https://www.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=aHhtTHVWNVYzTFBua2dSUlBRL1Rjdz09

Dipti, D. A., McBride, B. A., Fiese, B. H., Jones, B. L., & Cho, H. (2013). Risk factors for overweight/obesity in preschool children: an ecological approach. *Childhood Obesity (Print)*, *9*(5), 399–408. http://doi.org/10.1089/chi.2012.0150

Faith, M., Dennison, B., Edmunds, L., & Stratton, H. (2006). Fruit juice intake predicts increased adiposity gain in children from low-income families: weight status-by-environment interaction. *Pediatrics*, *118*(5), 2066–2075. http://doi.org/10.1542/peds.2006-1117

Flegal, K. M., Carroll, M. D., Kit, B. K., & Ogden, C. L. (2012). Among US adults , 1999-2010. *American Medical Association*, *307*(5), 491–497. http://doi.org/10.1001/jama.2012.39

Garba, J. A., Rampal, L., Hejar, A. R., & Salmiah, M. S. (2014). Major Dietary Patterns and their Associations with Socio-demographic Characteristics and Obesity among Adolescents in Petaling District, Malaysia. *Malays J Med Heal Sci*, *10*(1), 13-21.

Gatineau, M., & Dent, M. (2011). *Obesity and mental health*. *Oxford: National Obesity Observatory*. Retrieved from http://www.noo.org.uk/NOO_pub/briefing_papers

Gewa, C. A. (2010). Childhood overweight and obesity among Kenyan pre-school children: association with maternal and early child nutritional factors. *Public Health Nutrition*, *13*(4), 496–503. http://doi.org/10.1017/S136898000999187X

Gilliland, F. D., Berhane, K., Islam, T., McConnell, R., Gauderman, W. J., Gilliland, S. S., … Peters, J. M. (2003). Obesity and the risk of newly diagnosed asthma in school-age children. *American Journal of Epidemiology*, *158*(5), 406–415. http://doi.org/10.1093/aje/kwg175

Gillman, M. w, & Ludwig, D. S. (2013). How early should obesity prevention start? *The New England Journal of Medicine*, *369*(23), 2173–2175.

Guo, S. S., Wu, W., Chumlea, W. C., & Roche, A. F. (2002). Predicting overweight and obesity in adulthood from body mass index values in childhood and adolescence. *Am J Clin Nutr*, *76*(3), 653–658. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12198014

Hannon, T. S., Rao, G., & Arslanian, S. A. (2015). Childhood obesity and type 2 Diabetes Mellitus. *Global Public Health*, *10*(4), 532–544. http://doi.org/10.1542/peds.2004-2536

Harder, T., Bergmann, R., Kallischnigg, G., & Plagemann, A. (2005). Duration of breastfeeding and risk of overweight: a meta-analysis. *American Journal of Epidemiology*, *162*(5), 397–403. http://doi.org/10.1093/aje/kwi222

Hediger, M. L., Overpeck, M. D., Kuczmarski, R. J., et al. (2001). Association between infant breastfeeding and overweight in young children. JAMA, 285(19), 2453–2460. doi:10.1001/jama. 285.19.2453

Hunsberger, M., Formisano, A., Reisch, L. A., Bammann, K., Moreno, L., De Henauw, S., … Lissner, L. (2012). Overweight in singletons compared to children with siblings: the IDEFICS study. *Nutrition & Diabetes*, *2*(7), e35. http://doi.org/10.1038/nutd.2012.8

Hunsberger, M. (2014). Early feeding practices and family structure: associations with overweight in children. *The Proceedings of the Nutrition Society*, *73*(1), 132–6. http://doi.org/10.1017/S0029665113003741

Hurley, K. M., Pepper, M. R., Candelaria, M., Wang, Y., Caulfield, L. E., Latta, L., … Black, M. M. (2013). Systematic development and validation of a theory-based questionnaire to assess. *The Journal of Nutrition*, (14), 2–7. http://doi.org/10.3945/jn.113.179846.is

Irwin, L. G., Arjumand, S., & Hertzman, C. (2007). Early child development : a powerful equalizer early child development. *Report*, 1–38. http://doi.org/10.1016/j.worlddev.2010.10.008

Kagamimori, S., Yamagami, T., Sokejima, S., Numata, N., Handa, K., Nanri, S., ... & Yoshida, K. (1999). The relationship between lifestyle, social characteristics and obesity in 3- year- old Japanese children. *Child: care, health and development*, *25*(3), 235-248.

Kirch, W. (2008). Statistical power analysis. In *Encyclopedia of Public Health SE - 3345* (p. 1311). http://doi.org/10.1007/978-1-4020-5614-7_3345

Koch, F. S., Sepa, A., & Ludvigsson, J. (2008). Psychological stress and obesity. *Journal of Pediatrics*, *153*(6). http://doi.org/10.1016/j.jpeds.2008.06.016

Koletzko, B., Broekaert, I., Demmelmair, H., Franke, J., Hannibal, I., Oberle, D., … Verwied-Jorky, S. (2005). Protein intake in the first year of life: a risk factor for later obesity? The E.U. childhood obesity project. *Advances in Experimental Medicine and Biology*, *569*, 69–79.

Koletzko, B., Von Kries, R., Monasterolo, R. C., Subías, J. E., Scaglioni, S., Giovannini, M., … Grote, V. (2009). Can infant feeding choices modulate later obesity risk? In *American Journal of Clinical Nutrition* (Vol. 89, p. 1502S–8S). http://doi.org/10.3945/ajcn.2009.27113D

Kruger, H.S., Margetts, B. M. & Vorster, H.H. (2004). Evidence for relatively greater subcutaneous fat deposition in stunted girls in the NorthWest Province, South Africa, as compared with non-stunted girls. *Nutrition 20*, 564–569.

Larson, N., Ward, D. S., Neelon, S. B., & Story, M. (2011). What role can child-care settings play in obesity prevention? A review of the evidence and call for research efforts. *Journal of the American Dietetic Association*, *111*(9), 1343-1362.

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

Lim, K. K., & Teh, C. C. (2012). A cross sectional study of public knowledge and attitude towards antibiotics in Putrajaya, Malaysia. *Southern med review*, *5*(2), 26.

Lwanga, S., & Lemeshow, S. (1991). Sample size determination in health studies: A practical manual, 1991. *World Health Organization, Geneva*, 88. http://doi.org/10.2307/2290547

MacDorman, M., Kimeyer, S., & Wilson, E. (2012). Fetal and perinatal mortality, United States, 2006. *National Vital Statistics Report*, *60*(8), 1–23. Retrieved from http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_08.pdf

Maher, E. J., Li, G., Carter, L., & Johnson, D. B. (2008). Preschool child care participation and obesity at the start of kindergarten. *Pediatrics*, *122*(2), 322–330. http://doi.org/10.1542/peds.2007-2233

Mahshid, D., Noori, A.-D., & Anwar T, M. (2005). Childhood obesity, prevalence and prevention. *Nutrition Journal*, *4*(1), 24. http://doi.org/10.1186/1475-2891-4-24

Malina, B. R. (1999). Normal weight gain in growing children. *Healthy Weight Journal, 13* (June), 13-14.

Mangrio, E., Lindström, M., & Rosvall, M. (2010). Early life factors and being overweight at 4 years of age among children in Malmö, Sweden. *BMC Public Health*, *10*(1), 764. http://doi.org/10.1186/1471-2458-10-764

Martin, F. J., Moco, S., Montoliu, I., Collino, S., Da Silva, L., Rezzi, S., … Steenhout, P. (2014). Impact of breast-feeding and high- and low-protein formula on the metabolism and growth of infants from overweight and obese mothers. *Pediatric Research*, *75*(4), 535–43. http://doi.org/10.1038/pr.2013.250

Meng, L., Xu, H., Liu, A., van Raaij, J., Bemelmans, W., Hu, X., … Ma, G. (2013). The costs and cost-effectiveness of a school-based comprehensive intervention study on childhood obesity in China. *PloS One*, *8*(10), e77971. http://doi.org/10.1371/journal.pone.0077971

Ministry of Education Malaysia. (2015). *Education for all 2015: national review report Malaysia.* Retrieved from: http://unesdoc.unesco.org/images/0022/002297/229719E.pdf

Ministry of Health Malaysia. (2011). *Garis panduan penggunaan buku rekod kesihatan bayi dan kanak-kanak (0-6 tahun), kad simpanan klinik dan carta pertumbuhan WHO (2006) dan carta lilit kepala CDC (2000)*. Putrajaya: Bahagian Pembangunan Kesihatan Keluarga Kementerian Kesihatan Malaysia.

Ministry of Health Malaysia. (2011). *National Health and Morbidity Survey 2011.Vol II: Non-Communicable Diseases. Kuala Lumpur: Institute for Public Health, National Institute of Health (NIH).*

Ministry of Health Malaysia. (2015). *National Health and Morbidity Survey 2015.Vol II: Non-Communicable Diseases. Kuala Lumpur: Institute for Public Health, National Institute of Health (NIH).*

Ministry of Health Malaysia. (2016). *National Health and Morbidity Survey 2016.Vol II: Maternal and Child Health Findings. Kuala Lumpur: Institute for Public Health, National Institute of Health (NIH).*

Must, A., Jacques, P., Dallal, G., Bajema, C., & Dietz, W. (1992). Long-term morbidity and mortality of overweight adolescents. *The New England Journal of Medicine*, *327*(19), 1350–1355.

Neelon, S., Andersen, C., Morgen, C., Kamper-Jørgensen, M., Oken, E., Gillman, M. W., & Sørensen, T. I. A. (2015). Early child care and obesity at 12 months of age in the Danish National Birth Cohort. *International Journal of Obesity*, *39*(1), 33–http://doi.org/10.1038/ijo.2014.173

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

Nidhi, G., Kashish, G., Priyali, S., & Anoop, M. (2016). Childhood obesity in developing countries. *Endocrine Reviews*, *33*(February 2012), 48–70. http://doi.org/10.1210/er.2010-0028

Norliza, M. P. H. A., Nor Afiah, M. Z., & Anisah, B. (2014). A Systematic Review of Internet-Based Family Intervention for Childhood Obesity, *11*(1), 144–152. http://doi.org/10.5829/idosi.wjms.2014.11.1.8481

Nurliyana, A. R., Shariff, Z. M., Taib, M. N. M., Gan, W. Y., & Tan, K. A. (2016). Early nutrition, growth and cognitive development of infants from birth to 2 years in Malaysia: a study protocol. *BMC pediatrics*, *16*(1), 160.

Nurzalinda, Z., Hamid, J. M. J., Ling, L. S., Najman, J., McIntyre, H. D., & Abdullah, M. (2015). Association of parental body mass index before pregnancy on infant growth and body composition: evidence from a pregnancy cohort study in Malaysia. *Obesity Research and Clinical Practice*, *10*, S35–S47. http://doi.org/10.1016/j.orcp.2015.08.002

Ogden, C., Kuczmarski, R., Flegal, K., Mei, Z., Guo, S., Wei, R., … Johnson, C. (2002). Centers for Disease Control and Prevention 2000 Growth Charts for the United States: improvements to the National Centre for health statistics version. *Paediatric*, *109*(1), 45. http://doi.org/10.1542/peds.109.1.45

Organisation for Economic Co-operation and Development. (2014). *OECD: Obestiy update 2014*. OECD health statistics. Retrived from http://doi.org/10.1007/s11428-009-0404-2

Oxford Living Dictionaries. (n.d.). *Developing country*. Retrieved from https://en.oxforddictionaries.com/definition/developing_country

Parvez, H., Bisher, K., & Meguid, E. (2007). Obesity and diabetes in the developing world: a growing challenge. *New England Journal of Medicine*, *356*(3), 213–215. http://doi.org/10.1056/NEJMp068177

Pheng, L. (2007). Child care services in Malaysia. *Exchange-Exchange Press-*, (June), 82–84. Retrieved from https://childcareexchange.com/library/5017501.pdf

Rathnayake, K. M., Satchithananthan, A., Mahamithawa, S., & Jayawardena, R. (2013). Early life predictors of preschool overweight and obesity: a case-control study in Sri Lanka. *BMC Public Health*, *13*, 994. http://doi.org/10.1186/1471-2458-13-994

Reilly, J. J., Armstrong, J., Dorosty, A. R., Emmett, P. M., Ness, A., Rogers, I., … Sherriff, A. (2005). Early life risk factors for obesity in childhood: cohort study. *BMJ (Clinical Research Ed.)*, *330*(7504), 1357. http://doi.org/10.1136/bmj.38470.670903.E0

Roberto, C. A., Swinburn, B., Hawkes, C., Huang, T. T.-K., Costa, S. A., Ashe, M., … Brownell, K. D. (2015). Patchy progress on obesity prevention: emerging examples, entrenched barriers, and new thinking. *The Lancet*, *385*(9985), 2400–2409. http://doi.org/10.1016/S0140-6736(14)61744-X

Robinson, S. M., Crozier, S. R., Harvey, N. C., Barton, B. D., Law, C. M., Godfrey, K. M., … Inskip, H. M. (2015). Modifiable early-life risk factors for childhood adiposity and overweight : an analysis of their combined impact and potential for prevention 1 – 4. *American Journal of Clinical Nutrition*, *101*, 368–375. http://doi.org/10.3945/ajcn.114.094268.Am

Russell, C. G., Taki, S., Laws, R., Azadi, L., Campbell, K. J., Elliott, R., … Denney-Wilson, E. (2016). Effects of parent and child behaviours on overweight and obesity in infants and young children from disadvantaged backgrounds: systematic review with narrative synthesis. *BMC Public Health*, *16*(1), 151. http://doi.org/10.1186/s12889-016-2801-y

Sbruzzi, G., Eibel, B., Barbiero, S. M., Petkowicz, R. O., Ribeiro, R. A., Cesa, C. C., … Pellanda, L. C. (2013). Educational interventions in childhood obesity: a systematic review with meta-analysis of randomized clinical trials. *Preventive Medicine*, *56*(5), 254–264. http://doi.org/10.1016/j.ypmed.2013.02.024

Serene Tung, E.H., Shamarina, S., Mohd Nasir, M.T. (2011). Familial and socio-environmental predictors of overweight and obesity among primary school children in Selangor and Kuala Lumpur. *Malaysian journal of nutrition*, *17*(2), 151-162.

Sherina, M. S., & Rozali, A. (2004). Childhood obesity: contributing factors, consequences and intervention. *Malaysian Journal of Nutrition*, *10*(1), 13–22. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/22691744

Sjoberg, R. L., Nilsson, K. ., & Leppert, J. (2005). Obesity, shame, and depression in school-aged children: a population-based study. *Pediatrics*, *116*(3), e389–e392. http://doi.org/10.1542/peds.2005-0170

Sorof, J. M., Poffenbarger, T., Franco, K., Bernard, L., & Portman, R. J. (2002). Isolated systolic hypertension, obesity, and hyperkinetic hemodynamic states in children. *Journal of Pediatrics*, *140*(6), 660–666. http://doi.org/10.1067/mpd.2002.125228

Tamayo, T., Herder, C., & Rathmann, W. (2010). … Factors (childhood socioeconomic factors and adversities) on future risk of Type 2 Diabetes, metabolic disturbances and obesity: a systematic review. *BMC Public Health*, *10*, 525–540. Retrieved from http://www.biomedcentral.com/1471-2458/10/525

Taylor, B. J., Heath, A. M., Galland, B. C., Gray, A. R., Lawrence, J. A., Sayers, R. M., … Taylor, R. W. (2011). Prevention of overweight in infancy (POI.nz) study: a randomised controlled trial of sleep, food and activity interventions for preventing overweight from birth. *BMC PUBLIC HEALTH*, *11*, 942. http://doi.org/10.1186/1471-2458-11-942

Taylor, R. W., Heath, A.-L. M., Galland, B. C., Cameron, S. L., Lawrence, J. A., Gray, A. R., … Taylor, B. J. (2016). Three-year follow-up of a randomised controlled trial to reduce excessive weight gain in the first two years of life: protocol for the POI follow-up study. *BMC Public Health*, *16*, 771–783. http://doi.org/10.1186/s12889-016-3383-4

Tee, E. S. (2011). Obesity among children – an urgent call for action [Powerpoint slides]. Retrieved from http://www.meadjohnsonasia.com.my/data/sites/1/pdf/icare/2011upm/part-1-dr-tee-e-siong.pdf

Tovar, A., Vaughn, A. E., Fallon, M., Hennessy, E., Burney, R., Ostbye, T., & Ward, D. S. (2016). Providers' response to child eating behaviors: a direct observation study. *Appetite*, *105*, 534–541. http://doi.org/10.1016/j.appet.2016.06.020

Trasande, L., & Chatterjee, S. (2009). The impact of obesity on health service utilization and costs in childhood. *Obesity*, *17*(9), 1749–1754. http://doi.org/10.1038/oby.2009.67

Trasande, L., Liu, Y., Fryer, G., & Weitzman, M. (2009). Effects of childhood obesity on hospital care and costs, 1999-2005. *Health Affairs*, *28*(4), w751–w760. http://doi.org/10.1377/hlthaff.28.4.w751

United States Agency for International Development. (2015). *Intensive Nutrition Programming. Multi-sectoral nutrition strategy 2014–2025: Technical Guidance Brief*. Ghana:: USAID.

Veldhuis, L., Vogel, I., Renders, C. M., van Rossem, L., Oenema, A., HiraSing, R. A., & Raat, H. (2012). Behavioral risk factors for overweight in early childhood; the "Be active, eat right"study. *International Journal of Behavioral Nutrition and Physical Activity*, *9*(1), 74.

Vikneswaran, S., Idayu Badila, I., Rosnah, S., Zaleha, M. I., Saidatul Norbaya, B., & Hasanain Faisal, G. (2015). Managing obesity in malaysian schools: are we doing the right strategies? *Malaysian Journal of Public Health Medicine*, *15*(2), 75–83.

Washington, P., Reifsnider, E., Bishop, S., Ethington, M., & Ruffin, R. (2010). Changes in family variables among normal and overweight preschoolers. *Issues in Comprrhensive Pediatric Nursing*, *33*(1), 20–38. http://doi.org/10.3109/01460860903486531

Watt, T. T., Appel, L., Roberts, K., Flores, B., & Morris, S. (2013). Sugar, stress, and the supplemental nutrition assistance program: early childhood obesity risks among a clinic-based sample of low-income hispanics. *Journal of Community Health*, *38*(3), 513–520. http://doi.org/10.1007/s10900-012-9641-1

Weiss, R., Dziura, J., Burgert, T., Tamborlane, W., & Taksali, S. (2004). Obesity and the metabolic syndrome in children and adolescents. *The New England Journal of Medicine, 350*, 2362–2374.

Wen, L. M., Baur, L. A., Rissel, C., Xu, H., & Simpson, J. M. (2014). Correlates of body mass index and overweight and obesity of children aged 2 years: findings from the healthy beginnings trial. *Obesity*, *22*(7), 1723–1730. http://doi.org/10.1002/oby.20700

Whitlock, E. P., Williams, S. B., Gold, R., Smith, P. R., & Shipman, S. A. (2005). Screening and interventions for childhood overweight: a summary of evidence for the US preventive services task force. *Pediatrics*, *116*(1), 125–144. http://doi.org/10.1542/peds.2005-0242

Wong, C. Y., Zalilah, M. S., Chua, E. Y., Norhasmah, S., Chin, Y. S., & Nur'Asyura, A. S. (2015). Double-burden of malnutrition among the indigenous peoples (Orang Asli) of Peninsular Malaysia. *BMC public health*, *15*(1), 680.

World Health Organization. (2007). *WHO Child Growth Standards: Methods and development*. Geneva: WHO Press.

World Health Organisation. (2016). *Ending Childhood Obesity*. Geneva: Switzerland.

World Health Organization. (2017). Double burden of malnutrition. Retrieved from http://www.who.int/nutrition/double-burden-malnutrition/en/

Zeina, M.-M., Kramer, M. S., & Dewey, K. G. (2010). Infant feeding modifies the relationship between rapid weight gain in infancy and childhood obesity. *The FASEB Journal*, *24*(1 (Supplement)), 556–5.

Zeina, M.-M., Metallinos-Katsaras, E., & Kathryn, G. D. (2011). Obesity in preschool children is more prevalent and identified at younger age using WHO chart. *The Journal of Nutrition*, *141*(6), 1154–1158. http://doi.org/10.3945/jn.111.138701

Zhang, J., Himes, J. H., Guo, Y., Jiang, J., Yang, L., Lu, Q., … Shi, S. (2013). Birth weight, growth and feeding pattern in early infancy predict overweight/obesity status at two years of age: a birth cohort study of Chinese infants. *PLoS ONE*, *8*(6), 1–9. http://doi.org/10.1371/journal.pone.0064542

Zhang, T., Cai, L., Ma, L., Jing, J., Chen, Y., & Ma, J. (2016). The prevalence of obesity and influence of early life and behavioral factors on obesity in Chinese children in Guangzhou. *BMC Public Health*, *16*(1), 954. http://doi.org/10.1186/s12889-016-3599-3