



**UNIVERSITI PUTRA MALAYSIA**

***SOCIO-ECONOMIC, BIOLOGICAL, PSYCHOLOGICAL AND  
BEHAVIOURAL FACTORS ASSOCIATED WITH HEALTH-RELATED  
QUALITY OF LIFE AMONG ADOLESCENTS IN KUALA LUMPUR***

**KAARTINA V. SANKER**

**FPSK(m) 2015 64**



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By

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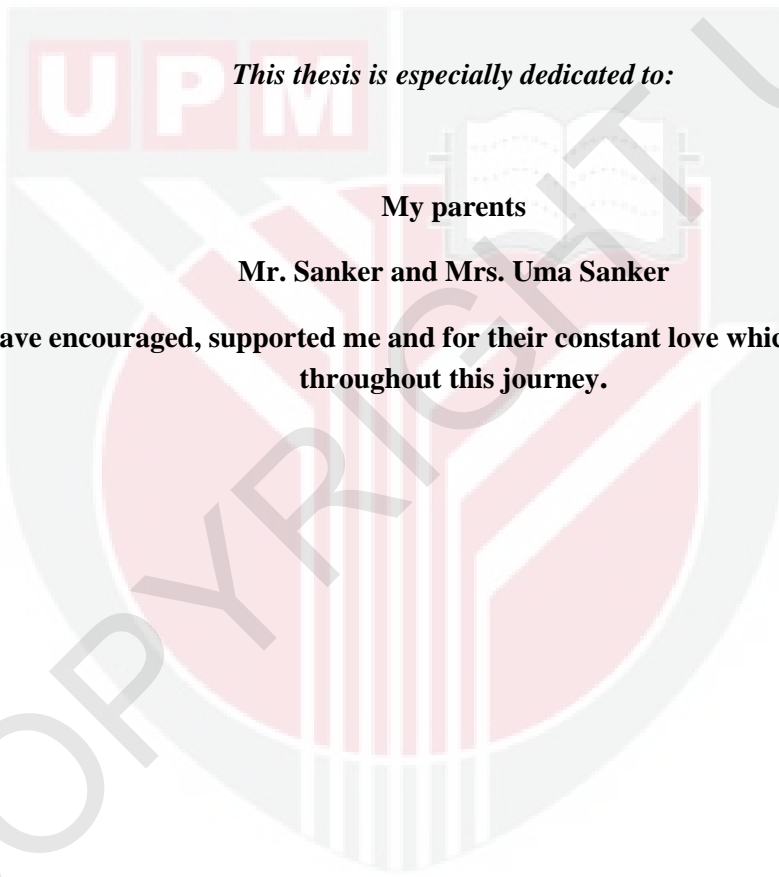
**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in  
Fulfillment of the Requirements for the Degree of Master of Science**

**March 2015**

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*This thesis is especially dedicated to:*

**My parents**

**Mr. Sanker and Mrs. Uma Sanker**

**Who have encouraged, supported me and for their constant love which have sustained throughout this journey.**

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UPM

Abstract of thesis presented to the Senate of Universiti Putra Malaysia  
in fulfillment of the requirement for the degree of Master of Science

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**March 2015**

**Chair : Chin Yit Siew, PhD**  
**Faculty: Medicine and Health Sciences**

Poor health-related quality of life (HRQoL) is no longer associated with only overweight and obesity as evidence shows that there are other factors contributing towards HRQoL. Thus, the aim of this study is to determine the association between socio-economic, biological, psychological, behavioural factors and HRQoL among adolescents in Kuala Lumpur, Malaysia. A cross-sectional multistage study was carried out in five selected schools in the Federal Territory of Kuala Lumpur. A total of 501 Malaysian students (male: 42.0%; female: 58.0%) aged between 13-17 years participated in this study. Majority of the respondents were Malays (49.0%), 39.0% were Chinese, 9.0% were Indians and 3.0% were of other ethnic groups. Respondents were required to complete a Two-day Dietary Recall, Two-day Physical Activity Recall, Pubertal Development Scale, Multi-dimensional Body Image Scale, Depression, Anxiety and Stress Scale, Rosenberg Self-esteem Questionnaire, Nutrition Knowledge Questionnaire, Eating Behavior Questionnaire, Three Factor Eating Questionnaire and PedsQL™ 4.0 Generic Core Scale. The mean score for total HRQoL was  $74.1 \pm 16.3$ . As for the HRQoL dimension, the highest score was obtained in the social function ( $80.4 \pm 19.7$ ), followed by physical function ( $78.2 \pm 18.5$ ) school function ( $71.0 \pm 19.4$ ) and emotional function ( $67.0 \pm 21.9$ ). Parental monthly income ( $r = 0.109$ ,  $p < 0.05$ ), father ( $r = 0.105$ ,  $p < 0.05$ ) and mother total years of schooling ( $r = 0.132$ ,  $p < 0.05$ ) had significant associations with total HRQoL score. There was a weak relationship between age and total HRQoL score ( $r = 0.126$ ,  $p < 0.01$ ). There was a significant difference in the total HRQoL score between the ethnic groups whereby Indian respondents obtained the highest score whereas Malay respondents demonstrated lowest score ( $F = 5.205$ ,  $p < 0.05$ ). Further, all psychological factors (depression, anxiety, stress, body image, self-esteem, nutrition knowledge) were associated with total HRQoL score ( $r = -0.545$ ,  $p < 0.01$ ;  $r = -0.542$ ,  $p < 0.01$ ;  $r = -0.528$ ,  $p < 0.01$ ;  $r = -0.200$ ,  $p < 0.01$ ;  $r = 0.302$ ,  $p < 0.01$ ;  $r = 0.178$ ,  $p < 0.01$ ) respectively. Total energy intake/body weight and carbohydrate intake were negatively significantly correlated with total HRQoL score ( $r = -0.145$ ,  $p < 0.05$ ;  $r = -0.113$ ,  $p < 0.01$ ). Respondents who had regular main meals reported better overall HRQoL ( $r = 0.181$ ,  $p < 0.01$ ) while respondents who snacked between main meals demonstrated poor HRQoL ( $t = 2.496$ ,  $p < 0.05$ ). Next, respondents who demonstrated higher scores in the cognitive restraint, emotional eating and uncontrolled eating subscale reported lower total HRQoL score ( $r = -0.135$ ,  $p < 0.01$ ;  $r = -0.238$ ,  $p < 0.01$ ;  $r = -0.150$ ,  $p < 0.01$ ) respectively. Respondents with higher energy expenditure/body weight were reported to have better HRQoL when compared to their counterpart ( $r = 0.166$ ,  $p < 0.01$ ), whereas respondents who spent more time on screen based media (SBM) showed poor HRQoL ( $r = -0.444$ ,  $p < 0.01$ ). However, there was no significant association between sex ( $t = 0.858$ ,  $p = 0.391$ ), BMI-for-age

( $r=0.120$ ,  $p=0.938$ ), body weight status ( $F=0.178$ ,  $p=0.837$ ), pubertal stage ( $F=2.157$ ,  $p=0.073$ ), perceived pubertal timing ( $F=1.29$ ,  $p=0.855$ ), fat ( $r=-0.021$ ,  $p=0.144$ ) and protein intake ( $r=-0.066$ ,  $p=0.644$ ), family meal frequency ( $F=2.062$ ,  $p=0.069$ ) and physical activity level ( $F=1.96$ ,  $p=0.838$ ) with total HRQoL score. A six factor-model which comprises depression, anxiety, SBM, ethnicity (Indian), carbohydrate intake, and meal frequency explain 45.4% of the variances in HRQoL among adolescents ( $R^2=0.454$ ) was derived using the Multiple Linear Regression. This study suggests that low risk of depression and anxiety, decreased SBM usage, being an Indian, decreased carbohydrate intake and increased main meal frequency would result in good HRQoL among respondents in Kuala Lumpur Malaysia. Thus, program planner should consider psychological factors, ethnicity difference and healthy eating behaviour in implementing intervention to improve HRQoL among adolescents.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra  
Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**FAKTOR SOCIO-EKONOMI, BIOLOGI, PSIKOLOGI DAN TINGKAH-LAKU  
YANG BERKAITAN DENGAN KUALITI KESIHATAN YANG BERKAITAN  
DENGAN KEHIDUPAN DALAM KALANGAN REMAJA DI KUALA LUMPUR**

Oleh

**KAARTINA A/P V.SANKER**

**Mac 2015**

**Pengerusi: Chin Yit Siew, PhD**  
**Fakulti : Perubatan dan Sains Kesihatan**

Kualiti kesihatan yang kurang baik berkaitan kehidupan (HRQOL) tidak lagi berkaitan dengan berat badan berlebihan dan obesiti, malah bukti menunjukkan bahawa terdapat faktor - faktor lain yang menyebabkan keadaan sedemikian. Tujuan kajian ini adalah untuk menentukan hubungan antara faktor-faktor sosio-ekonomi, biologi, psikologi, tingkah-laku dengan kualiti kesihatan yang berkaitan dengan kehidupan dalam kalangan remaja di Kuala Lumpur, Malaysia. Kajian keratan rentas pelbagai peringkat telah dijalankan di lima buah sekolah di Wilayah Persekutuan Kuala Lumpur. Sejumlah 501 pelajar Malaysia (lelaki: 42.0%; perempuan: 58.0%) berumur antara 13-17 tahun mengambil bahagian dalam kajian ini. Majoriti daripada responden-responden adalah Melayu (49.0%), 39.0% adalah Cina, 9.0% adalah India dan adalah 3.0% daripada kumpulan etnik lain. Responden diminta mengisi beberapa borang kaji-selidik iaitu peringatan semula diet dua hari, peringatan semula aktiviti fizikal dua hari, skala perkembangan puberti, skala imej tubuh multi-dimensi, skala kemurungan, kebimbangan dan stres, skala harga diri *Rosenberg*, soal-selidik pengetahuan pemakanan, soal-selidik tiga faktor pemakanan, dan *PedsQL™ Generic Core Scale*. Skor min bagi jumlah HRQoL adalah  $74.1 \pm 16.3$ . Manakala bagi dimensi-dimensi HRQoL, markah tertinggi adalah dalam fungsi sosial ( $80.4 \pm 19.7$ ), diikuti dengan fungsi fizikal ( $78.2 \pm 18.5$ ), fungsi sekolah ( $71.0 \pm 19.4$ ) dan emosi ( $67.0 \pm 21.9$ ). Pendapatan bulanan ibu bapa ( $r=0.109$ ,  $p<0.05$ ) serta jumlah tahun persekolahan bapa ( $r=0.105$ ,  $p<0.05$ ) dan ibu ( $r=0.132$ ,  $p<0.05$ ) mempunyai hubungan yang signifikan dengan skor keseluruhan HRQoL. Kajian menunjukkan terdapat hubungan yang lemah antara umur dan skor keseluruhan HRQoL ( $r=0.126$ ,  $p<0.01$ ). Terdapat perbezaan yang signifikan pada skor keseluruhan HRQoL antara kumpulan etnik yang mana responden kaum India mendapat skor tertinggi dan responden kaum Melayu mendapat skor terendah ( $F=5.205$ ,  $p<0.05$ ). Selain itu, terdapat hubungan yang signifikan di antara semua faktor-faktor psikologi (kemurungan, kebimbangan, stress, imej tubuh, harga diri, pengetahuan pemakanan) dengan skor keseluruhan HRQoL ( $r=-0.545$ ,  $p<0.01$ ;  $r=-0.542$ ,  $p<0.01$ ;  $r=-0.528$ ,  $p<0.01$ ;  $r=-0.200$ ,  $p<0.01$ ;  $r=0.302$ ,  $p<0.01$ ;  $r=0.178$ ,  $p<0.01$ ) masing-masing. Terdapat hubungan yang negatif dan lemah antara jumlah pengambilan tenaga/berat badan dan pengambilan karbohidrat dan skor keseluruhan HRQoL ( $r=-0.145$ ,  $p<0.05$ ;  $r=-0.113$ ,  $p<0.01$ ). Responden yang mengambil hidangan utama dilaporkan skor keseluruhan HRQoL yang lebih baik manakala responden yang makan antara

waktu makan utama menunjukkan bacaan HRQoL rendah ( $r=0.181$ ,  $p<0.01$ ). Seterusnya, responden yang menunjukkan markah yang lebih tinggi dalam sekatan kognitif, emosi dan makan skala yang tidak terkawal, masing-masing melaporkan jumlah skor HRQoL rendah ( $r=-0.135$ ,  $p<0.01$ ;  $r=-0.238$ ,  $p<0.01$ ;  $r=-0.150$ ,  $p<0.01$ ). Responden dengan penggunaan tenaga/berat badan yang lebih tinggi telah dilaporkan mempunyai HRQoL lebih baik berbanding dengan rakan sekumpulan yang tidak aktif ( $r=0.166$ ,  $p<0.01$ ), manakala responden yang menghabiskan lebih banyak masa pada media berskrin menunjukkan HRQoL skor keseluruhan yang lebih rendah ( $r=-0.444$ ,  $p<0.01$ ). Walau bagaimanapun, tiada hubungan signifikan diantara jantung ( $t=0.858$ ,  $p=0.391$ ), BMI-untuk-umur ( $r=0.120$ ,  $p=0.938$ ), status berat badan ( $F=0.178$ ,  $p=0.837$ ), perkembangan puberti ( $F=2.157$ ,  $p=0.073$ ), masa kedewasaan ( $F=1.29$ ,  $p=0.855$ ), pengambilan lemak ( $r=-0.021$ ,  $p=0.144$ ), protein ( $r=-0.066$ ,  $p=0.644$ ), kekerapan bermakan bersama keluarga ( $F=2.062$ ,  $p=0.069$ ) dan tahap aktiviti fizikal ( $F=1.96$ ,  $p=0.838$ ) dengan skor keseluruhan HRQoL. Dengan menggunakan Regresi Linear, model enam faktor yang terdiri daripada kemurungan, kebimbangan, jumlah masa diperuntukkan untuk media skrin, kumpulan etnik (India), pengambilan karbohidrat dan kekerapan mengambil hidangan utama menerangkan 45.4% daripada variasi dalam HRQoL ( $R^2=0.454$ ) di kalangan remaja. Kajian ini mencadangkan bahawa risiko rendah kemurungan dan kebimbangan, penurunan penggunaan SBM, sebagai seorang India, penurunan pengambilan karbohidrat dan peningkatan kekerapan mengambil hidangan utama akan memberi nilai HRQoL baik di kalangan responden di Kuala Lumpur Malaysia. Oleh itu, perancang program perlu mengambil kira faktor-faktor psikologi, perbezaan etnik dan tingkah laku pemakanan sihat dalam melaksanakan intervensi untuk meningkatkan HRQoL dalam kalangan remaja.



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I certify that a Thesis Examination Committee has met on 27 March 2015 to conduct the final examination of Kaartina a/p V.Sanker on her thesis entitled "Socio-Economic, Biological, Psychological and Behavioural Factors Associated with Health-Related Quality of Life among Adolescents in Kuala Lumpur" 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 Science.

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## LIST OF ABBREVIATIONS

AGFI	Adjusted Goodness-of-fit Index
AMOS	Analysis of Moment Structure
AVE	Average Variance Extracted
BMI	Body Mass Index
BMR	Basal Metabolic Rate
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CMIN	Chi-square difference
CR	Construct Reliability
DASS	Depression, Anxiety, Stress Scale
EBQ	Eating Behavior Questionnaire
GFI	Goodness-of-fit Index
HRQoL	Health-related Quality of Life
MBIS	Multi-dimensional Body Image Scale
MET	Metabolic Equivalent
MLR	Multiple Linear Regression
NFI	Normed Fit Index
PedsQL	Pediatric Quality of Life Inventory
RNI	Recommended Nutrition Intake
SBM	Screen Based Media
SPSS	Statistical Package for the Social Sciences
TFEQ-R	Three Factor Eating Questionnaire
TDEE	Total Daily Energy Expenditure
TLI	Tucker Lewis index
RMSEA	Root Mean Square Error of Approximation
WHO	World Health Organization

## OPERATIONAL DEFINITION OF TERMS

1. **Health-related quality of life (HRQoL):** Quality of life of an individual associated with their physical, mental and social well-being (WHO, 1948).
2. **Nutrition knowledge:** The knowledge of respondents on nutrients, function of vitamins and minerals and balanced diet (Turconi et al., 2003).
3. **Main meal consumption:** Breakfast, lunch and dinner are classified as main meals (Leal, Philippi, Matsudo & Toassa, 2010).
4. **Snacking:** Snacking is defined as the consumption of food and drink between meals (Savage, MacFarlane, Ball & Worsley, 2007).
5. **Screen Based Media (SBM):** Screen based media use such as watching television, playing video games or using the computer for non-educational purposes (Lacy et al., 2011).

## CHAPTER 1

### INTRODUCTION

#### 1.1 Background of the Study

World Health Organization (WHO) has defined health-related quality of life (HRQoL) as the “quality of life of an individual associated with their physical, mental and social well-being” (WHO, 1948). The WHO Quality of Life Group (WHOQOL Group, 1993a) has reported that quality of life is a broad range of concept on how quality of life influences an individual’s physical health, psychological state, independence, social relationships and their perception towards environmental influences. HRQoL has been commonly used to determine an individual or a population’s health status by self-assessment. Indicators of HRQoL may include wealth and employment, physical and mental health, education, recreation and leisure time as well as social well-being (Gregory, Johnston & Pratt, 2009).

The 2001-2010 National Health and Nutrition Examination Survey (NHANES) conducted in the United States of America is a nationally representative survey of adolescents in a non-clinical population (Rossen & Schoendorf, 2012). This study has reported that adolescent’s self-rated health has declined gradually over the past 10 years regardless of their socioeconomic status (Rossen & Schoendorf, 2012). Specifically, in the year 2003-2004, 5.7% of the adolescents reported to have poor HRQoL whereas 10.3% of adolescents in 2009-2010 were shown to have poor HRQoL (Cui & Zack, 2013). This indicates that the prevalence of poor HRQoL in adolescents has almost doubled over the past 10 years. In addition, literature has reported unhealthy behaviour developed during adolescence may continue throughout lifetime and lead to poor HRQoL (Chen et al., 2005).

Previously, studies were conducted to assess HRQoL in a clinical population such as patients with cancer (Varni & Katz, 1997), asthma (Chan et al., 2005), hip replacement patients (Laupacis et al., 1993) and clinically obese children (Hughes, Farewell, Harris & Reilly, 2007). Despite the presence of chronic diseases, an individual’s HRQoL can also be influenced by other factors (Schwimmer, Burwinkle & Varni, 2003). Therefore, current researchers are beginning to document HRQoL in a non-clinical population (Schwimmer et al., 2003; Williams, Wake, Hesketh, Maher & Waters, 2005). For example, researchers who were conducting studies in a non-clinical population focused on impact of HRQoL among respondents with BMI above normal range. While BMI is not a single factor contributing towards HRQoL, many factors such as stigmatization (Jensen & Steele, 2011), poor psychological well-being (Janicke et al., 2007), unhealthy eating behaviours (Chen et al., 2005) and being physically inactive (Bize, Johnson & Plotnikoff, 2007) could contribute towards poor HRQoL.

Overall, HRQoL of an individual in a non-clinical population could be influenced by various factors. Concurrent with the adverse changes in lifestyle due to growth of technology, it is undeniable that the health status of a general population may decrease gradually. Thus, measuring HRQoL in a general population can be used as community health indicators. These health indicators can provide information on progress in achieving the nation's health objectives and to reduce health disparities (Centers for Disease Control Prevention (CDC), 2000). Improvement in quality of life of the public health is important as HRQoL is the evaluation of both positive and negative aspects of life. Hence, the results of this study would be able to emphasize the risk factors leading towards poor HRQoL. These factors can be incorporated into intervention programs to help improve the adolescent's HRQoL.

## 1.2 Problem Statement

WHO (2007) defines "adolescents" as individuals in the 10-19 years age group whereby adolescence has been reported to be one of the most dynamic and complicated transitions in the lifecycle (Lerner & Spanier, 1980). Moreover, adolescence is a period of time whereby early signs of secondary sexual characteristics development and ends when the individual has attained adult status (WHO, 1995). Therefore, there will be changes in physical, emotional and cognitive function during adolescence. HRQoL among adolescents is a concern as adolescence is a time frame whereby lifestyle habits are embraced and carried over into adulthood (Savige, MacFarlane, Ball, Worsley & Crawford, 2007). Unhealthy lifestyle such as being physically inactive and poor eating habits could lead to poor HRQoL which may be brought forward into adulthood.

Despite the increasing research on factors contributing towards HRQoL internationally, there is little existing information on the HRQoL among Malaysian adolescents in a general population. Though there are studies conducted to assess HRQoL in specific conditions such as patients with thalassaemia (Ismail, Campbell, Mohd Ibrahim, & Jones, 2006) and disable children (Rahman et al., 2011), there are very limited studies that have assessed the HRQoL of a general population. This is important as determination of HRQoL in a general population can provide a better view of the health status of Malaysian adolescents.

Due to the lifestyle adopted during adolescence, the rate of overweight and obesity has been increasing. Evidence has shown that children and adolescents with higher BMI have demonstrated poorer HRQoL when compared to their normal weight counterparts (Tsiros et al., 2009). Moreover, Malaysia has been ranked top five in prevalence of overweight and obesity among Asian countries and has been placed equal with some of the countries such as the USA and the Middle East (Liow, 2010). Furthermore, adolescents who are obese are likely to remain obese as adults (Gordon-Larson, Adair, Nelson & Popkin, 2004) which may lead to long-term negative impact on health. While previous studies have shown the association between overweight and obesity with HRQoL (Ostbye, Malhotra, Wong, Tan & Saw, 2010; Tsiros et al., 2009), there has been limited evidence on the association between body weight status and HRQoL among Malaysian adolescents in a non-clinical population. Considering the increasing



prevalence of overweight and obesity, there is a need to study the association between overweight and obesity with HRQoL among Malaysian adolescents.

Evidences have shown that unhealthy eating behaviour during adolescence has placed adolescents as a vulnerable group that does not meet dietary recommendations (Savige, MacFarlane, Ball, Worsley, & Crawford, 2007; Shi, Lien, Kumar & Holmboe-Ottesen, 2006). Adolescence is a period characterized by increased mobility, independence from home as well as financial independence (WHO, 2005). This allows adolescents to consume their favourite food items in different ways. For instance, eating out from home becomes more frequent during adolescence (Rolland-Cachera, Bellisle & Deheeger, 2000). Studies have shown that unhealthy eating habits during adolescence can also be practised during adulthood and demonstrate poor HRQoL (Chen et al., 2005; Mikkila, Rasanen, Raitakari, Pietinen & Viikari, 2005; Wu, Ohinmaa & Veugelets, 2011).

Moreover, physical activity levels are more likely to decline among adolescents, and physical inactivity may be practiced during adulthood (Tammelin, Nayha, Laitinen, Rintamaki & Jarvelin, 2003). Adolescent nowadays are utilizing their time on computer games, homework and other activities rather than spending time on outdoor exercise and sports (Tse & Yuen, 2009). Lacy et al. (2012) reported that adolescents who spent more time watching television and playing computer games reported poorer HRQoL when compared to adolescents who spend less time on these activities. Despite the growing evidence on the association between physical activity and HRQoL among adolescents, there have been very limited studies exploring the association between physical activity and HRQoL among Malaysian adolescents.

Furthermore, factors such as disordered eating, psychological well-being, family influence and socio-economic factors may play a central role in HRQoL among adolescents (Janicke et al., 2007; Ostbye, Malhotra, Wong, Tan & Saw, 2010; Tozun, Unsal, Ayranca & Arslan, 2010). However, the contribution of these factors towards HRQoL is less well studied. As poor HRQoL among adolescents is no longer confined to only overweight and obesity, thus there is a need to formulate a multifactorial model explaining the factors that may contribute to poor HRQoL among adolescents. Factors contributing to poor HRQoL among adolescents cannot be neglected as betterment of HRQoL during adolescence can help acquire better HRQoL in adulthood. Moreover, modifiable factors such as eating behaviour and family influence should be identified to improve HRQoL among adolescents.

Thus, this study aims to investigate the socio-economic (parental income, father's total year of schooling, mother's total year of schooling), biological (age, sex, ethnicity, pubertal development, BMI-for-age), psychological (body image, depression, anxiety, stress, self-esteem, nutrition knowledge) and behavioural factors (dietary intake, eating behaviour, physical activity) as risk factors of HRQoL. Thus, this study aims to seek answers for the following research question:



1. Are there any significant socio-economic, biological, psychological and behavioural factors explaining the variances in HRQoL among adolescents in Kuala Lumpur?

### **1.3 Objectives**

#### **1.3.1 General Objective**

To determine the factors associated with HRQoL among adolescents in Kuala Lumpur.

#### **1.3.2 Specific Objectives**

1. To determine the socio-economic factors (parental income, father's total year of schooling, mother's total year of schooling), biological factors (age, sex, ethnicity, pubertal development, BMI-for-age), psychological factors (body image, depression, anxiety, stress, self-esteem, nutrition knowledge), behavioural factors (dietary intake, eating behaviour, physical activity) and HRQoL among adolescents in Kuala Lumpur.
2. To determine the association between socio-economic (parental income, father's total year of schooling, mother's total year of schooling), biological (age, sex, ethnicity, pubertal development, BMI-for-age), psychological (body image, depression, anxiety, stress, self-esteem, nutrition knowledge) and behavioural factors (dietary intake, eating behaviour, physical activity) with HRQoL among adolescents in Kuala Lumpur.
3. To determine the socio-economic (parental income, father's total year of schooling, mother's total year of schooling), biological (age, sex, ethnicity, pubertal development, BMI-for-age), psychological (body image, depression, anxiety, stress, self-esteem, nutrition knowledge) and behavioural factors (dietary intake, eating behaviour, physical activity) in explaining the variances in HRQoL among adolescents in Kuala Lumpur.

### **1.4 Null Hypotheses**

H<sub>01</sub>. There were no significant associations between socio-economic (parental income, father's total year of schooling, mother's total year of schooling), biological (age, sex, ethnicity, pubertal development, BMI-for-age), psychological (body image, depression, anxiety, stress, self-esteem, nutrition knowledge) and behavioural factors (dietary intake, eating behaviour, physical activity) with HRQoL among adolescents in Kuala Lumpur.

H<sub>02</sub>. There were no significant socio-economic (parental income, father's total year of schooling, mother's total year of schooling), biological (age, sex, ethnicity, pubertal

development, BMI-for-age), psychological (body image, depression, anxiety, stress, self-esteem, nutrition knowledge) and behavioural factors (dietary intake, eating behaviour, physical activity) in explaining the variances in HRQoL among adolescents in Kuala Lumpur.

### **1.5 Conceptual Framework**

HRQoL can be defined as an individual's perception of their place in life comprising of the culture and value system of which they live in and their reactions towards goals, standards and concerns (WHOQOL Group, 1993b). Assessment of HRQoL is able to provide a broad view on the health status of adolescents in the general population.

In this study, poor HRQoL is observed as an outcome contributed by several factors. Based on previous literature, socio-economic, biological, psychological and behavioural factors are proposed as risk factors that may influence HRQoL among adolescents. Thus, this study proposes a multifactorial model to determine the contributing factors towards HRQoL.

Specifically, socio-economic factors in the proposed model consist of parental education level and income (Cassedy et al., 2013). These factors have been found to have an impact on the HRQoL of an individual as income and educational attainment influences an individual's life opportunities. Children and adolescents who come from families with higher levels of socio-economic status as there are exposed to better health care system and awareness on health related issues which can directly contribute to a person's HRQoL.

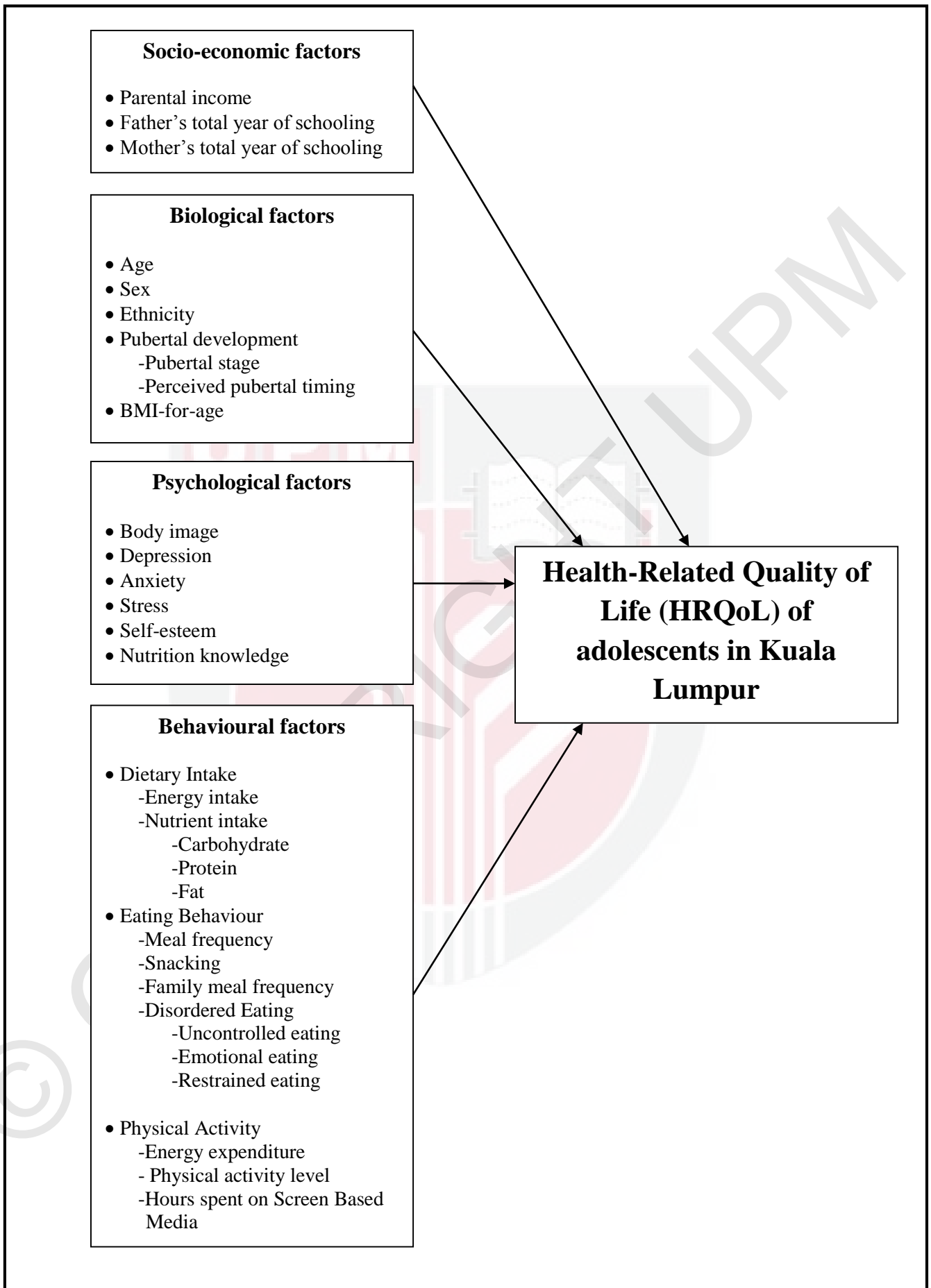
Next, biological factors encompass age, sex, ethnicity, pubertal development and BMI-for-age (Ostbye, Malhotra, Wong, Tan & Saw, 2010; Riazi, Shakoor, Dundas, Eiser & McKenzie, 2010; Schwimmer, Burwinkle & Varni, 2003). Studies have shown that female and older adolescents demonstrate poorer HRQoL when compared to adolescents who are younger and who are males (Tsiros et al., 2009). There are also abundant established evidences that have shown elevated BMI does influence the HRQoL of an adolescent (Schwimmer, Burwinkle & Varni, 2003; Tsiros et al., 2009). Age, sex and elevated BMI may contribute to poor HRQoL as older adolescents may face social stigmatization, while female and overweight adolescents may have low self-esteem which could directly have an impact on their HRQoL.

Moreover, psychological influences which encompass body image, depression, anxiety, stress, self-esteem and nutrition knowledge have shown to be associated with HRQoL among adolescents (Janicke et al., 2007; Kolotkin et al., 2006). Adolescents with negative body image, at-risk of depression, anxiety and stress has shown to have poor HRQoL when compared to their counterpart who are not at-risk of negative body image, depression, anxiety and stress (Janicke et al., 2007; Kolotkin et al., 2006). Further, Swallen, Reither, Haas and Meier (2005) reported that young adolescents aged 12-14 showed a significant association between self-esteem and HRQoL whereby adolescents who demonstrated low self-esteem demonstrated poor HRQoL. On the

other hand, healthy eating has been reported to be associated with good HRQoL (Boyle, Jones & Walters, 2010). Thus, there is a need to assess nutrition knowledge among the adolescents.

As for behavioural factors, the present multifactorial model includes dietary intake, eating behaviour and physical activity (Bize, Johnson & Plotnikoff, 2007; Boyle et al., 2010; Fulton et al., 2009; Tozun, Unsal, Ayrance & Arslan, 2010). Though the association between eating behaviour and HRQoL has been studied, only limited factors have been included such as meal skipping. On the other hand, a growing body of literature has shown that adolescents who are engaged with disordered eating demonstrated lower HRQoL scores when compared to adolescents without disordered eating (Herpertz-Dahlmann, Holling, Vloet & Ravens-Sieberer, 2008; Tozun, Unsal, Ayrance & Arslan, 2010). Studies have reported that adolescents with disordered eating may have psychological problems such as lower self-esteem and negative body image (Ranzenhofer et al., 2012). Subsequently, these psychological problems may lead to poor HRQoL (Ranzenhofer et al., 2012). Moreover, studies have demonstrated that adolescents who practice a physically active lifestyle have better HRQoL (Bize, Johnson & Plotnikoff, 2007; Lacy et al., 2012) which has been included in this study.

As supported by previous literature, socio-economic, biological, psychological and behavioural factors were included as independent variables of HRQoL in this study (Figure 1.1). Hence, the present study aimed to determine the contribution of socio-economic, biological, psychological and behavioural factors towards HRQoL among adolescents in Kuala Lumpur, Malaysia.



**Figure 1.1: Conceptual framework**

## 1.6 Significance of the Study

This cross-sectional study was conducted to determine the risk factors leading towards poor HRQoL among adolescents. Factors of HRQoL that has been included in this study are socio-economic, biological, psychological and behavioural factors. Thus, this study has produced a comprehensive model on factors contributing to poor HRQoL among adolescents. Consequently, this study is able to provide in depth knowledge on socio-economic, biological, psychological and behavioural factors that contributes to poor HRQoL since overweight and obesity has been reported as not the only factor contributing towards poor HRQoL in a general population among adolescents.

Further, the model proposed in this study can help in recognition of possible factors that may contribute in planning an effective health and nutrition intervention programs which are able to help adolescents to practice healthy lifestyle. Also, information on these factors can be incorporated into school curriculum and disseminated through the mass media to create awareness on factors associated with poor HRQoL among adolescents and parents.

This model have also provided baseline information for future research and reference for researchers as there is very limited information on HRQoL among adolescents in a general population. Further, this study can be used as a baseline for future studies such as an interventional or cohort study. Moreover, this study can provide a better understanding on the HRQoL of adolescents for program planners, community leaders, policy makers as well as other authorities for developing future research, intervention programs and policy.

Once the risk factors leading to HRQoL among adolescents is identified, development of prevention and intervention programs at individual, family and community levels can be planned to promote healthy lifestyle. Better understanding on factors related to poor HRQoL can help improve the HRQoL of adolescents effectively.

## REFERENCES

- Across, L.S., Longfors, J., Fjeldstad, A.S., Fjeldstad, C., Schank, B., Nickel, K.J., Montgomery, P., & Gardner, A.W. (2006). Physical activity is related to quality of life in older adults. *Health and Quality of Life Outcomes*. 4: 37-42.
- Adler, N.E., & Newman, K. (2002). Socioeconomic disparities in health: pathways and policies. *Health Affairs (Millwood)*. 21(2): 60-76.
- Affenito, S.G., Thompson, D.R., Barton, B.A., Franko, D.L., Daniels, S.R., Obarzanek, E., Schreiber, G.B., & Striegel-Moore, R. H. (2005). Breakfast consumption by African-American and white adolescent girls correlates positively with calcium and fiber intake and negatively with body mass index. *Journal of the American Dietetic Association*. 105: 938-945.
- Ainsworth, B.E., Haskell, W.L., Leon, A.S., Jacobs, Jr., Montoye, H.J., Sallis, J.F., Paffenbarger, R.S. (1993). Compendium of physical activities: classification of energy costs of human physical activities. *Medicine & Science in Sports & Exercise*. 25: 71-80.
- Ainuddin, H.A., Loh, S.Y., Chinna, K., Low, W.Y., & Roslani, A.C. (2013). Psychometric properties of the self-report Malay version of the Pediatric Quality of Life (PedsQL™) 4.0 Generic Core Scales among multiethnic Malaysian adolescents. *Journal of Life Health Care*. 10: 1-10.
- Allison, D.B., & Heshka, S. (1993). Emotion and eating in obesity? A critical analysis. *International Journal of Eating Disorders*. 13: 289-295.
- Amiri, P.M., Ardekani, E., Jalali-Farahani, S., Hosseninpanah, F., Varni, J.W., Ghofranipour, F., Montazeri, A., & Azizi, F. (2010). Reliability and validity of the Iranian version of the Pediatric Quality of Life Inventory™ Generic Core Scales in adolescents. *Quality of Life Research*. 19(10): 1501-1508.
- Amorim, L.D., Bangdiwala, S.I., McMurray, R.G., Creighton, D., & Harrell, J. (2007). Intraclass correlations among physiologic measures in children and adolescents. *Nursing Research and Practice*. 56(5): 355-60.
- Andaya, A.A., Arredondo, E.M., Alcaraz, J.E., Lindsay, S.P. & Elder, J.P. (2011). The association between family meals, TV viewing during meals, and fruits, vegetables, soda and chips intake among Latino children. *Journal of Nutrition Education and Behavior*. 43(5): 308-315.
- Anderson, A.S., Macintyre, S., & West, P. (1993). Adolescent meal patterns: grazing habits in the west of Scotland. *Health Bulletin*. 51: 158-165.



- Anderson, K.D., Chad, K.E. & Spink, K.S. (2005). Osteoporosis knowledge, beliefs and practices among adolescent females. *Journal of Adolescent Health*. 36(4): 305-312.
- Ansari, W.E., Clausen, S.V., Mabhala, A., & Stock, C. (2010). How Do I Look? Body image perceptions among university students from England and Denmark. *International Journal of Research on Public Health*. 7(2): 583-595.
- Arif, A.A., & Rohrer, J.E. (2006). The relationship between obesity, hyperglycemia symptoms, and health-related quality of life among Hispanic and non-Hispanic white children and adolescents. *BMC Family Practice*. 7(3): 34-41.
- Austin, S.B., Melly, S.J., Sanchez, B.N., Patel, A., Buka, S. & Gortmaker, S.L. (2005). Clustering of fast-food restaurants around schools: a novel application of spatial statistics to the study of food environments. *American Journal of Public Health*. 95: 1575-1581.
- Axelsson, D.A., & Birmaher, B. (2001) Relation between anxiety and depressive disorders in childhood and adolescence. *Depression and Anxiety*. 14: 67-78.
- Banfield, S.S., & McCabe, M.P. (2002). An evaluation of the construct of body image. *Adolescence*. 37(146): 373-393.
- Bennett, S., Woods, T., Liyanage, W.M., & Smith, D.L. (1991). A simplified general method for cluster-sample surveys of health in developing countries. *World Health Statistics Quarterly*. 44(3): 98-106.
- Berkey, C., Rockett, H., Gillman, M., Field, A., & Colditz, G. (2003). Longitudinal study of skipping breakfast and weight change in adolescents. *International Journal of Obesity*. 27: 1258-1266.
- Bertéus Forslund, H., Torgerson, J. S., Sjostrom, L., & Lindroos, A. K. (2005). Snacking frequency in relation to energy intake and food choices in obese men and women compared to a reference population. *International Journal of Obesity*. 29: 711-719.
- Bize, R., Johnston, J.A., & Plotnikoff, R.C. (2007). Physical activity level and health-related quality of life in the general adult population: A systematic review. *Preventive Medicine*. 45(6): 401-415.
- Borello, A. (2005). Subjective well-being and academic success among college students. (Proquest Education Journal Service No.AAT3147525)
- Bowling, A. (1999). *Health-related quality of life: a discussion of concept, its use and measurement background: The "quality of life"*. Presented to the Adapting to Change Core Course.
- Boyle, S.E., Jones, G.I., & Walters, S.J. (2010). Physical activity, quality of life, weight status and diet in adolescents. *Quality of Life Research*. 19(7): 943-954.

- Brittany, E., Matheson, B.S., Tanofsky-Kraff, M., Shafer-Berger, S., Sedaka, N.M., Mooreville, M., Reina, S.A., Vannucci, A. . . Yanovski, J.A. (2012). Eating Patterns in Youth with and without Loss of Control Eating. *International Journal of Eating Disorder*. 45:957–961.
- Brown, J.D., & Witherspoon, E.M. (2002). The mass media and American adolescents' health. *Journal of Adolescent Health*. 31(6): 153-170.
- Burrows, A., & Cooper, M. (2002). Possible risk factors in the development of eating disorders in overweight pre-adolescent girls. *International Journal of Obesity*. 26(9): 1268-1273.
- Cash, T. F., & Pruzinsky, T. (Eds.). (2002). *Body image: A handbook of theory, research, and clinical practice*. New York: Guilford.
- Cash, T.F. (2004). Body image: past, present and future. *Body Image*. 1: 1-5.
- Cassedy, A., Fairbrother, G., Newacheck, P.W. (2008). The impact of insurance instability on children's access, utilization, and satisfaction with health care. *Ambulatory Pediatrics*. 8(5): 321-328.
- Cassedy, A., Drotar, D., Ittenbach, R., Hottinger, S., Wray, J., Wernovsky, G., Newburger, J.W., Mahony, L., Mussatto, K., Cohen, M.I. & Maroni, B.S. (2013). The impact of socio-economic status on health related quality of life for children and adolescents with heart disease. *Health and Quality of Life Outcomes*. 11: 99-107.
- Centers for Disease Control and Prevention (US). (2000). *Measuring Healthy Days: population assessment of health-related quality of life, Atlanta, Georgia*: Department of Health and Human Services, CDC, National Center for Chronic Disease Prevention and Health Promotion, Division of Adult and Community Health (US).
- Chan, K.S., Mangione-Smith, R., Burwinkle, T.M., Rosen, M.B.S.N., & Varni, James.W. (2005). The PedsQL™: Reliability and Validity of the Short-Form Generic Core Scales and Asthma Module. *Medical Care*. 43(3): 256-265.
- Chen, X., Sekine, M., Hamanishi, S., Wang, H., Gaina, A., Yamagami, T., & Kagamimori, S. (2005). Lifestyles and health-related quality of life in Japanese school children: a cross-sectional study. *Preventive Medicine*. 40: 668-678.
- Chen, H., & Jackson, T. (2008). Prevalence and sociodemographic correlates of eating disorder endorsements among adolescents and young adults from China. *European Eating Disorders Review*. 16: 375-85.



- Chin, Y.S., Mohd Taib, M.N., Mohd Shariff, Z., & Khor, G.I. (2008). Development of multi-dimensional body image scale for Malaysian female adolescents. *Nutrition Research and Practice*. 2(2): 85-92.
- Chin, Y.S. & Mohd Taib, M.N. (2009). Eating behaviours among female adolescents in Kuantan District, Pahang, Malaysia. *Pakistan Journal of Nutrition*. 8(4): 425-243.
- Chugh, R., & Puri, S. (2001). Affluent adolescent girls of Delhi: eating and weight concerns. *British Journal of Nutrition*. 86: 535-542.
- Clay, D., Vignoles, V.L., & Dittmar, H. (2005). Body image and self-esteem among adolescent girls: Testing the influence of sociocultural factors. *Journal of Research in Adolescence*. 15(4): 263-280.
- Conley, C.S., & Rudolph, K.D. (2009). The emerging sex difference in adolescent depression: Interacting contributions of puberty and peer stress. *Development Psychopathology*. 21: 593-620.
- Costarelli, V., Koretsi, E. & Georgitsogianni, E. (2012). Health-related quality of life of Greek adolescents: the role of the Mediterranean diet. *Quality of Life Research*. 22(5): 951-956.
- Cox, T.L., Zunker, C., Wingo, B., Thomas, D.M. & Ard, J.D. (2010). Body image and quality of life in a group of African American women. *Social Indicators Research*. 99: 531-540.
- Crossman, A., Anne Sullivan, D., & Benin, M. (2006). The family environment and American adolescents' risk of obesity as young adults. *Social Science & Medicine*. 63: 2255-2267.
- Cui, W., & Zack, M.M. (2013). Trends in Health-related quality of life among adolescents in the United States, 2001-2010. *Preventing Chronic Disease*. 10: 1-6.
- Dalton, W. T., Schetzina, K. E., Pfortmiller, D. T., Slawson, D. L., & Frye, W. S. (2011). Health behaviors and health-related quality of life among middle school children in Southern Appalachia: Data from the winning with wellness project. *Journal of Pediatric Psychology*. 36(6): 677-686.
- Dan, S.P., Mohd Taib, M.N., & Zalilah, M.S. (2011). Determination of factors associated with physical activity levels among adolescents attending school in Kuantan, Malaysia. *Malaysian Journal of Nutrition*. 17: 175-187.
- Daniels, S.R., Arnett, D.K., Eckel, R.H., Gidding, S.S., Hayman, L.L., Kumanyika, S., Robinson, T.N., Scott, B.J., St Jeor, S., & Williams, C.L. (2006). Overweight in children and adolescents: pathophysiology, consequences, prevention, and treatment. *Circulation*. 111(15): 1999-2012.

- de Beer, M., Hofsteenge, G.H., Koot, H.M., Hirasing, R.A., Delemarre-van de Waal, H.A., & Gemke, R.J. (2007). Health-related-quality-of-life in obese adolescents is decreased and inversely related to BMI. *Acta Paediatrica*. 96(5): 710-714.
- Decaluwe, V. & Braet, C. (2003). Prevalence of binge eating disorder in obese children and adolescents seeking weight-loss treatment. *International Journal of Obesity*. 27: 404–409.
- de Lauzon, B., Romon, M., rie Deschamps, V., Lafay, L., Borys, J.M., Karlsson, J., Ducimetie`re, P., Charles, M.A., & the Fleurbaix Laventie Ville Sante (FLVS) Study Group. (2004). The Three-Factor Eating Questionnaire-R18 is able to distinguish among different eating patterns in a general population. *The Journal of Nutrition*. 2372-2380.
- de Vriendt, T., Matthys, C., Verbeke, W., Pynaert, I. & de Henauw, S. (2009). Determinants of nutrition knowledge in young and middle-aged Belgian women and the association with their dietary behaviors. *Appetite*. 52(3): 788-792.
- Dietz, W. H. (1994) Critical periods in childhood for the development of obesity. *The American Journal of Clinical Nutrition*. 59: 955–959.
- Dietz, W.H., & Gortmaker, S.L. (2001). Preventing obesity in children and adolescents. *Annual Review of Public Health*. 22: 337–353.
- Doyle, A.C., le Grange, D., Goldschmidt, A., & Wilfley, D.E. (2006). Psychosocial and physical impairment in overweight adolescents at high risk for eating disorders. *Obesity*. 15: 145-155.
- Drummond, S.E., Crombie, N.E., & Kirk, T. (1996) A critique of the effects of snacking on body weight status. *European Journal of Clinical Nutrition*. 50: 779–783.
- Dwyer, J.T., Evans, M., Stone, E.J., Feldman, H.A., Lytle, L., Hoelscher, D., Johnson, C., Zive, M., & Yang, M. (2001). Adolescents' eating patterns influence their nutrient intakes. *Journal of the American Dietetic Association*. 101:798-802.
- Eisenmann, J.C., Bartee, R.T., & Wang, M.Q. (2002). Physical Activity, TV Viewing, and Weight in U.S. Youth: 1999 Youth Risk Behavior Survey. *Obesity Research*. 10(5): 379-385.
- Eiser, C., & Morse, R. (2001). Quality –of- life measures in chronic diseases of childhood. *Health Technology Assessment*. 5: 1-157.
- Ezoe, S., & Morimoto, K. (1994). Behavioral lifestyle and mental health status of Japanese factory workers. *Preventive Medicine*. 23: 98– 105.

- Fallon, E.M., Tanofsky-Kraff, M., Norman, A.C., McDuffie, J.R. Taylor, E.D., Cohen, M.L. et al., (2005). Health-related quality of life in overweight and nonoverweight black and white adolescents. *Journal of Pediatric*. 147: 443-450.
- Faulkner, G.E.J., Adlaf, E.M., Irving, H.M., Allison, K.R., Dwyer, J.J.M., & Goodman, J. (2007). The relationship between vigorous physical activity and juvenile delinquency: a mediating role for self-esteem. *Journal of Behavioral Medicine*. 30: 155–163.
- FDA. (2006). *Guidelines for Industry: Patient-reported outcome measures: Use in medical product development to support labeling claims*. Center for Drug Evaluation and Research, Food and Drug Administration.
- Ferrans, C.E., & Ferrell, B.R. (1990) Development of a quality of life index for patients with cancer. *Oncology Nursing Forum*. 17: 15-19.
- Field, A.E., Austin, S.B., Taylor, C.B., Malspeis, S., Rosner, B., Rockett, H.R., Gillman, M.W. & Colditz, G.A. (2003). Relation between dieting and weight change among preadolescents and adolescents. *Pediatrics*. 112(4): 900-906.
- Finnea, E., Buckscha, J., Lampert, T. & Kolip, P. (2013). Physical activity and screen-based media use: cross-sectional associations with health-related quality of life and the role of body satisfaction in a representative sample of German adolescents. *Health Psychology & Behavioural Medicine*. 1(1): 15-30.
- Ford, T., Goodman, R., & Meltzer, H. (2003) The British Child and Adolescent Mental Health Survey 1999: The prevalence of DSM-IV disorders. *Journal of the American Academy of Child & Adolescent Psychiatry*. 42: 1203–1211.
- Frisen, A. (2007). Measuring health-related quality of life in adolescence. *Acta Paediatrica*. 96(7): 963–968.
- Fulton, J. E., Wang, X., Yore, M. M., Carlson, S. A., Galuska, D.A., & Caspersen, C. J. (2009). Television viewing, computer use, and BMI among U.S. children and adolescents. *Journal of Physical Activity and Health*. 6(1): 28–35.
- George, D., & Mallery, P. (2005). *SPSS for Windows step by step: A simple guide and reference*. Boston: Allyn and Bacon.
- Giles-Corti, B., Macintyre, S., Clarkson, J.P., Pikora, T., & Donovan, R.J. (2003). Environmental and Lifestyle Factors Associated With Overweight and Obesity in Perth, Australia. *American Journal of Health Promotion*. 18(1): 93-102.
- Goldhaber-Fiebert, J.D., Rubinfeld, R.E., Bhattacharya, J., Robinson, T.N., & Wise, P.H. (2012). The utility of childhood and adolescent obesity assessment in relation to adult health. *Medical Decision Making*. 33(2): 165-175.

- Goodwin, D.A.J. & Boggs, S.R. (1994). Development and validation of the pediatric oncology quality of life scale (POQOL). *Psychology Assessment*. 6: 321-328.
- Gopinath, B., Baur, L.A., Hardy, L.L., Kifley, A., Rose, K.A., Wong, T.Y., & Mitchell, P. (2012). Relationship between a range of sedentary behaviours and blood pressure during early adolescence. *Journal of Human Hypertension*. 26: 350-356.
- Gordon-Larsen, P., Adair, L.S., Nelson, M.C., & Popkin, B.M. (2004). Five-year obesity incidence in the transition period between adolescence and adulthood: The national longitudinal study of adolescent health. *American Journal of Clinical Nutrition*. 80: 569–575.
- Green, S.B. (1991). How many subjects does it take to do a regression analysis? *Multivariate Behavioral Research*. 26: 499-510.
- Gregory, J., & Lowe, S. (2000). National Diet and Nutrition Survey: Young People Aged 4 to 18 years. Volume 1: Report of the Diet and Nutrition Survey. London: The Stationery Office.
- Gregory, D., Johnston, R., & Pratt, G. (2009). “*Quality of Life*”. *Dictionary of Human Geography* (5<sup>th</sup> edition). Oxford: Wiley-Blackwell.
- Griffiths, L.J., Parsons, T.J., & Hill, A.J. (2010). Self-esteem and quality of life in obese children and adolescents: A systematic review. *International Journal of Pediatric Obesity*. 5(4): 282–304.
- Grover, V.P., Keel, P.K., & Mitchell, J.P. (2003). Gender differences in implicit weight identity. *International Journal of Eating Disorders*. 34(1): 125-35.
- Grunbaum, J.A., Brener, N.D., Kann, L., Kinchen, S.A., Whalen, L., Eaton, D., Hawkins, J., & Ross, J.G. (2004). Youth risk behavior surveillance—United States, 2003. *Morbidity and Mortality Weekly Report: Surveillance Summary*. 53: 1-96.
- Haines, J., & Neumark-Sztainer, D. (2006). Prevention of eating disorders and obesity: A consideration of shared risk factors. *Health Education Research*. 21(6): 770-782.
- Hajian-Tilaki, K. (2011). Sample size determination in epidemiologic studies. *Caspian Journal of Internal Medicine*. 2(4): 289-298.
- Hakala, P.T., Rimpela, A.H., Saarni, L.A. & Salminen, J.J. (2006). Frequent lated activities increase the risk of neck-shoulder and low back pain in adolescents. *European Journal of Public Health* . 16:536–541
- Hampl, J.S., Heaton, C.L. & Taylor, C.A. (2003). Snacking patterns influence energy and nutrient intakes but not body mass index. *Journal of Human Nutrition and Dietetics*. 16(1):3-11.

- Haraldstad, K., Christophersen, K.A., Eide, H., Nativg, G.K., & Helseth, S. (2010). Predictors of health-related quality of life in a sample of children and adolescents: a school survey. *Journal of Clinical Nursing*. 20: 3048-3056.
- Hardy, L.L., Dobbins, T., Booth, M.L., Denney-Wilson, E., & Okely, A.D. (2006). Sedentary behaviors among Australian adolescents. *Australian and New Zealand Journal of Public Health*. 30(6): 534-540.
- Harnack, L., Stang, J., & Story, M. (1999). Soft drink consumption among U. S. children and adolescents: nutritional consequences. *Journal of the American Dietetic Association*. 99: 436-441.
- Hazreen, M.A., Su, T.T., jalaludin, M.Y., Dahlui, M., Chinna, K., Ismail, M., Murray, L., Cantwell, M., Sadat, N.A. & My HeART Study Group. An exploratory study on risk factors for chronic non-communicable diseases among adolescents in Malaysia: overview of the Malaysian Health and Adolescents Longitudinal Research Team study (The MyHeART study). *BMC Public Health*. 14(3):36.
- Herpertz-Dahlmann, B., Holling, N., Vloet, T.D., & Ravens-Sieberer, U. (2008). Disordered eating behavior and attitudes, associated psychopathology and health-related quality of life: results of the BELLA study. *European Child & Adolescent Psychiatry*. 17: 82-91.
- Hofmann, A. D., & Greydanus, D. E. (Eds.). (1997). *Adolescent Medicine (3rd ed.)*. Stamford: Appleton & Lange.
- Hogan, M.J. & Strasburger, V.C. (2008). Body image, eating disorders and media. *Adolescent Medicine: State of the Art Reviews*. 19: 521-546.
- Hughes, A.R., Farewell, K., Harris, D., & Reilly, J.J. (2007). Quality of life in a clinical sample of obese children. *International Journal of Obesity (Lond)*. 31: 39-44.
- Huon, G.F., Mingyi, Q., Oliver K., & Xiao, G. (2002). A large-scale survey of eating disorder symptomatology among female adolescents in the People's Republic of China. *International Journal of Eating Disorders*. 32(2): 192-205.
- Iannotti, R. J., Kogan, M. D., Janssen, I., & Boyce, W. F. (2009). Patterns of adolescent physical activity, screen-based media use, and positive and negative health indicators in the U.S. and Canada. *Journal of Adolescent Health*. 44(5): 493-499.
- Iglesias-Gutierrez, E., Garcia-Roves, P., Garcia, A., & Patterson, A. (2008). Food preferences do not influence adolescent high-level athlete's dietary intake. *Appetite*. 50 (2-3): 536-543.
- Inclendon, E., Wake, M., & Hay, M. (2011). Psychological predictors of adiposity: systematic review of longitudinal studies. *International Journal of Pediatric Obesity*. 6(2): 1-11.



- Institute of Medicine (IOM). (2002). *Dietary reference intakes: energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids*. Washington, DC: National Academy Press.
- Irie, M., Miyata, M., Nagata, S., Mishima, N., Ikeda, M., & Hirayama, S. (1997). The relationship between workers' attitudes towards health, lifestyle and mental health. *San Ei Shi*. 39: 107–15.
- Ismail, M.N. (2002). The nutrition and health transition in Malaysia. *Public Health Nutrition*. 5(1): 191-195.
- Ismail, A., Campbell, M.J., Mohd Ibrahim, H., & Jones, G.L. (2006). Health related quality of life in Malaysian children with thalassaemia. *Health and Quality of Life Outcomes*. 4: 39-46.
- Jacobi, F., Wittchen, H.U., Holting, C., Hofler, M., Pfister, H., Muller, N., & Lieb, R. (2004). Prevalence, co-morbidity and correlates of mental disorders in the general population: results from the German Health Interview and Examination Survey (GHS). *Psychological Medicine*. 34(4): 597-611.
- Jago, R., Anderson, C.B., Baranowski, T., & Watson, K. (2005). Adolescent patterns of physical activity: differences by gender, day and time of day. *American Journal of Preventive Medicine*. 28: 447-452.
- Jahns, L., Siega-Riz, A.M. & Popkin, B.M. (2001). The increasing prevalence of snacking among US children from 1977 to 1996. *Journal of Pediatric*. 138: 493-498.
- Jalali-Farahani, S., Chin, Y.S., Amiri, P. & Mohd Taib, M.N. (2013). Body mass index (BMI)-for-age and health-related quality of life (HRQOL) among high school students in Tehran. *Child: Care, Health and Development*. 40(5): 731-739.
- Janicke, DM., Finney, JW., & Riley, AW. (2001). Children's health care use: a prospective investigation of factors related to care-seeking. *Medical Care*. 39: 990-1001.
- Janicke, D. M., Marciel, K. K., Ingerski, L. M., Novoa, W., Lowry, K. W., Sallinen, B. J., & Silverstein, J. H. (2007). Impact of psychosocial factors on quality of life in overweight youth. *Obesity*. 15: 1799–1807.
- Jebb, S. A. (2002). In C. G. Fairburn & K. D. Brownell (Eds.), *Eating disorders and obesity. A comprehensive handbook*. (2nd ed.). New York: Guilford Press.
- Jensen, C.D., & Steele, R.G. (2011). Longitudinal associations between teasing and health-related quality of life among treatment-seeking overweight and obese youth. *Journal of Pediatric Psychology*. 37(4): 438-447.
- Jequier, E., & Schutz, Y. (1983). Long-term measurements of energy expenditure in humans using a respiration chamber. *American Journal of Clinical Nutrition*. 38: 989-998.

- Johnson, W.G., Rohan, K.J., & Kirk, A.A. (2002). Prevalence and correlates of binge eating in white and African American adolescents. *Eating Behavior*. 3: 179-189.
- Johnston, L.D., Delva, J., & O'Malley, P.M. (2007). Soft drink availability, contracts and revenues in American secondary schools. *American Journal of Preventive Medicine*. 33(4): 209-225.
- Jorngarden, A., Wettergen, L., & von Essen, L. (2006). Measuring health-related quality of life in adolescents and young adults: Swedish normative data for the SF-36 and the HADS, and the influence of age, gender, and method of administration. *Health and Quality of Life Outcomes*. 4: 91.
- Juth, V., Smyth, J.M., & Santuzzi, A.M. (2008). How Do You Feel? Self-esteem Predicts Affect, Stress, Social Interaction, and Symptom Severity during Daily Life in Patients with Chronic Illness. *Journal of Health Psychology*. 13(7): 884-894.
- Kaplan R.M., Anderson J.P., & Ganiats, T.J. The Quality of Well-Being Scale: rationale for a single quality of life index. *Quality of Life Assessment: key issues in the 1990s*. Edited by Walker SR, Rosser RM (Eds). Dordrecht, Netherlands: Kluwer Academic Publishers. 1993; 65-94.
- Kaur, J., Cheong, S.M., Naidu, B.M., Kaur, G., Mala, A., Manickam, Mat Noor, M., Ibrahim, N. & Rosman, A. (2014). Prevalence and correlates of depression among adolescents in Malaysia. *Asia-Pacific Journal of Public Health*. 26(5)-53-62.
- Keating, C.L., Moodie, M.L., & Swinburn, B.A. (2011). The health-related quality of life of overweight and obese adolescents – a study measuring body mass index and adolescent-reported perceptions. *International Journal of Pediatric Obesity*. 6(5-6): 434-441.
- Kerr, M.A., Rennie, K.L., McCaffrey, T.A., Wallace, J.M.W., Hannon-Fletcher, M.P. and Livingstone, M.B.E. (2009). Snacking patterns among adolescents: a comparison of type, frequency and portion size between Britain in 1997 and Northern Ireland in 2005. *British Journal of Nutrition*. 101(1): 122-131.
- Kerver, J.M., Yang, E.J., Obayashi, S., Bianchi, L. & Song, W.O. (2006). Meal and snack patterns are associated with dietary intake of energy and nutrients in US adults. *Journal of the American Dietetic Association*. 106(1):46-53.
- Kim, K.H., & Yang, K.M. (2008). The relationship between eating disorders and parent-adolescent communication in middle school students in rural areas. *Taehan Kanho Hakhoe Chi*. 38: 55-63.

- Kim, H.S., Park, J., Ma, Y., & Ham, O.K. (2013). Factors Influencing Health-Related Quality of Life of Overweight and Obese Children in South Korea. *The Journal of School Nursing*. 00(0): 1-9.
- Klohe-Lehman, D.M., Freeland-Graves, J., Anderson, E.R., McDowell, T., Clarke, K.K., & Hanss-Nuss, H. (2006). Nutrition knowledge is associated with greater weight loss in obese and overweight low-income mothers. *Journal of the American Dietetic Association*. 106(1): 65-75.
- Knauss, C., Paxton, S.J., & Alsaker, F.D. (2007). Relationship amongst body dissatisfaction, internalisation of the media body ideal and perceived pressure from media in adolescent girls and boys. *Body Image*. 4(4): 353-360.
- Kolotkin, R.L., Zeller, M., Modi, A.C., Samsa, G.P., Quinlan, N.P., Yanovski, J.A., Bell, S.K., Maahs, D.M., de Serna, D.G. & Roehrig, H.R. (2006). Assessing weight-related quality of life in adolescents. *Obesity*. 14(3): 448-457.
- Kopp, M., & Kovacs, M.E. (Eds.). (2006). *Quality of Life of the Hungarian Population at the Turn of the Millenium*. Budapest: Semmelweis Publishing House.
- Lacy, K.E., Allender, S.E., Kremer, P.J., de Silva-Sanigorski, A.M., Millar, L.Y., Moodie, M.L., Mathews, L.B., Malakellis, M. & Swinburn, B.A. (2012). Screen time and physical activity behaviors are associated with health-related quality of life in Australian adolescents. *Quality of Life Research*. 21: 1085-1099.
- Larson, N.I., Neumark-Sztainer, D., Hannan, P.J., & Story, M. (2007). Family meals during adolescence are associated with higher diet quality and healthful meal patterns during young adulthood. *Journal of the American Dietetic Association*. 107: 1502–1510.
- Laupacis, A., Bourne, R., Feeny, D., Wong, C., Tugwell, P., Leslie, K., & Bullas, R. (1993). The effect of elective total hip replacement on health-related quality of life. *Journal of Bone and Joint Surgery*. 75(11): 1619-1626.
- Lazzeri, G., Pammolli, A., Azzolini, E., Simil, R., Meoni, V., de Wet, D.R. & Giacchi, M.V. (2013). Association between fruits and vegetables intake and frequency of breakfast and snacks consumption: a cross-sectional study. *Nutrition Journal*. 12: 123-134.
- Ledoux, S., Choquet, M., & Manfredi, R. (1993). Associated factors for self-reported binge eating among male and female adolescents. *Journal of Adolescence*. 16: 75-91.
- Lee, P.Y., Cheah, W.L., Chang, C.T., & Raudzah, G. (2012). Childhood obesity, self-esteem and health-related quality of life among early primary schools children in Kuching, Sarawak, Malaysia. *Malaysian Journal of Nutrition*. 18(2): 207-219.



- Lerner, R. M., & Spanier, G. B. (1980). A dynamic interactional view of child and family development. In R. M. Lerner & G. B. Spanier (Eds.), *Child Influences on Marital and Family Interaction: A Life-Span Perspective* (pp. 1-20). New York: Academic.
- Lioret, S., Touvier, M., Balin, M., Huybrechts, I., Dubuisson, C., Dufour, A., Bertin, M., Maire, B. & Lafay, L. (2011). Characteristics of energy under-reporting in children and adolescents. *British Journal of Nutrition*. 105: 1671-1680.
- Liow, T.L. (2010). The official launch of Majlis Cegah Obesiti Malaysia (MCOM) (Malaysian Council for Obesity Prevention).
- Lobstein. T., Baur, L., & Uauy, R. (2004). Obesity in children and young people: A crisis in public health. *Obesity Reviews*. 5(1): 4-85.
- Lovibond, S.H. & Lovibond, P.F. (1995). *Manual for the Depression anxiety Stress Scales*. (2nd Ed) Sydney: Psychology Foundation.
- Mahon, N.E., & Yarcheski, A. (2001). Mental health variables and positive health practices in early adolescents. *Psychological Reports*. 88: 1023– 1030.
- Marques-Vidal, P., Ravasco, P., Dias, C.M., & Camilo, M.E. (2006). Trends of food intake in Portugal, 1987-1999: results from the National Health Surveys. *European Journal of Clinical Nutrition*. 60: 1414-1422.
- MASO (2005). Strategy for the prevention of obesity-Malaysia. Malaysian Association for the Study of Obesity (MASO). Kuala Lumpur.
- Macdiarmid, J. & Blundell, J. (1998). Assessing dietary intake: who, what and why of under-reporting. *Nutrition Research Reviews*. 11: 231-253.
- McDermott, R.J., Hawkins, W.E., Duncan, D.F. (1987). Depression and health behavior of adolescents. *Psychological Reports*. 61: 111–113.
- Melnik, T.A., Rhoades, S.J., Wales, K.R., Cowell, C. & Wolfe, W.S. (1998). Food consumption patterns of elementary schoolchildren in New York City. *Journal of the American Dietetic Association*. 98:159-164.
- Mikkila, V., Rasanen, L., Raitakari, O.T., Pietinen, P., & Viikari, J. (2005). Consistent dietary patterns identified from childhood to adulthood: The Cardiovascular Risk in Young Finns Study. *British Journal of Nutrition*. 93: 923–931.
- Ministry of Human Resources. (2008). [cited at 2012 September 4] Malaysia standard classification of occupations 2008. Available from [http://www.mohr.gov.my/index.php?Itemid=424&id=784&option=com\\_content&task=view](http://www.mohr.gov.my/index.php?Itemid=424&id=784&option=com_content&task=view)
- Mirowsky, J., & Ross, C.E. (2003). *Social causes of psychological distress* (2<sup>nd</sup> ed). Walter de gruyter: New York.

- Molnar, D., Jeges, S., Erhardt, E., & Schutz, Y. (1995). Measured and predicted resting metabolic rate in obese and nonobese adolescents. *Journal of Pediatrics*. 127: 571-577.
- Moy, F.M., Gan, C.Y. & Siti Zaleha, M.K. (2004). Body mass status of school children and adolescents in Kuala Lumpur. *Malaysian Journal of Nutrition*. 12: 1-10.
- National Coordinating Committee on Food and Nutrition (NCCFN). (2005). *Recommended Nutrient Intakes for Malaysia: A report of the technical working group on Nutritional Guidelines*. Putrajaya: Ministry of Health.
- Neumark-Sztainer, D., Story, M., Hannan, P.J. & Croll, J. (2002). Overweight status and eating patterns among adolescents: where do youths stand in comparison with the *Healthy People 2010* objectives? *American Journal of Public Health*. 92: 844-851.
- Neumark-Sztainer, D., Wall, M., Perry, C., & Story, M. (2003). Correlates of fruit and vegetable intake among adolescents: Findings from Project EAT. *Preventive Medicine*. 37: 198-208.
- Neumark-Sztainer, D., Hannan, P.J., Story, M., & Perry, C.L. (2004). Weight control behaviors among adolescent girls and boys: implications for dietary intake. *Journal of the American Dietetic Association*. 104: 913-920.
- Neumark-Sztainer, D., Wall, M., Guo, J., Story, M., Haines, J., & Eisenberg, M. E. (2006). Obesity, disordered eating, and eating disorders in a longitudinal study of adolescents: How do dieters fare 5 years later? *Journal of the American Dietetic Association*. 106: 559-568.
- Newacheck, P.W., Hung, Y.Y., Park, M.J., Brindis, C.D., & Irwin Jr, C.E. (2003). Disparities in adolescent health and health care: does socioeconomic status matter? *Health Services Research*. 38(5): 1235-1252.
- Nicklas, T.A., Morales, M., Linares, A., Yang, S.J., Baranowski, T., De Moor, C., & Berenson, G. (2004). Children's meal patterns have changed over a 21-year period: The Bogalusa Heart Study. *Journal of the American Dietetic Association*. 104: 753-761.
- Nicklas, T.A., O'Neil, C., & Myers, L. (2004). The importance of breakfast consumption of children, adolescents, and young adults, *Nutrition Today*. 39: 30-39.
- Nicolson P., & Anderson, P. (2003). Quality of life, distress and self-esteem: A focus groups study of people with chronic bronchitis. *British Journal of Health Psychology*. 8: 251-270.
- Nieman, P. (2002). Psychosocial aspects of physical activity. *Pediatrics & Child Health*. 7(5): 309-312.

- Ng, T.P., Lim, L.C., Jin, A., & Shinfuku, N. (2005). Ethnic differences in quality of life in adolescents among Chinese, Malay and Indians in Singapore. *Quality of Life Research*. 14(7): 1755-68.
- Olumakaiye, M.F., Atinmo, T., & Olubayo-Fatiregun, M.A. (2010). Food consumption patterns of Nigerian Adolescents and Effect on Body weight. *Journal of Nutrition Education & Behavior*. 42: 144-151.
- Ostbye, T., Malhotra, R., Wong, H.B., Tan, S.B., & Saw, S.M. (2010). The effect of body mass on health-related quality of life among Singaporean adolescents: results from the SCORM study. *Quality of Life Research*. 19: 167-176.
- O'Toole, T.P., Anderson, S., Miller, C., & Guthrie, J. (2007). Nutrition services and foods and beverages available at schools: results from the School Health Policies and Programs Study 2006. *Journal of School Health*. 77: 500-521.
- Page, A.S., Cooper, A.R., Griew, P., & Jago, R. (2010). Children's screen viewing is related to psychological difficulties irrespective of physical activity. *Pediatrics*. 128(5): 1011-1017.
- Pahkala, K., Heinonen, O.J., Lagstrom, H., Hakala, P., Sillanmaki, L., & Simell, O. (2006). Leisure-time physical activity of 13-year-old adolescents. *Scandinavian Journal of Medicine & Science in Sports*. 17(4): 324-330.
- Patrick, D.L., & Deyo, R.A. (1989). Generic and disease-specific measures in assessing health status and quality of life. *Medical Care*. 27(3): 217-32.
- Patterson, J.M., & McCubbin, H.I. (1987). Adolescent coping style and behaviors: conceptualization and measurement. *Journal of Adolescence*. 10: 163-186.
- Pedersen, T.P., Meilstrup, C., Holstein, B.E. & Rasmussen, M. (2012). Fruit and vegetable intake is associated with frequency of breakfast, lunch and evening meal: cross-sectional study of 11-, 13-, and 15-year-olds. *International Journal of Behavioral Nutrition and Physical Activity*. 9:9.
- Petersen, A.C., Crockett, L., Richards, M., & Boxer, A. (1988). A self-report measure of pubertal status: Reliability, validity, and initial norms. *Journal of Youth and Adolescence*. 17(2): 117-133.
- Petersen, S., Hagglof, B., Stenlund, H., & Bergstrom, E. (2009). Psychometric properties of the Swedish PedsQL, Pediatric Quality of Life Inventory 4.0 generic core scales. *Acta Paediatrica*. 98: 1504-1512.
- Piernas, C., & Popkin, B.M. (2010). Snacking Increased among U.S. Adults Between 1977 and 2006. *The Journal of Nutrition*. 140: 325-332.
- Pinhas-Hamiel, O., Singer, S., Pilpel, N., Fradkin, A., Modan, D., & Reichman, B. (2006). Health-related quality of life in a clinical sample of obese children and adolescents. *International Journal of Obesity*. 30: 267-272.

- Poh, B.K., Ismail, M.N., Ong, H.F., Norimah, A.K., & Safiah, M.Y. (2004). BMR predictive equations for Malaysian adolescents aged 12-18 years. Final Report for IRPA 06-02-02-0096 Research Project. Kuala Lumpur: Department of Nutrition & Dietetics, Faculty of Allied Health Sciences, Universiti Kebangsaan Malaysia.
- Pollard, J., Kirk, S.F.L. & Cade, J.E. (2002). Factors affecting food choices in relation to fruit and vegetable intake. A review. *Nutrition Research Reviews*. 152(2): 373-387.
- Population Distribution and Basic Demographic Characteristics (2010). Population and Housing Census Malaysia, Department of Statistics Malaysia.
- Presnell, K., Bearman, S.K. & Stice, E. (2004). Risk factors for body dissatisfaction in adolescent boys and girls: a prospective study. *International Journal of Eating Disorder*. 36(4): 389-401.
- Prochnik Estima, C.D.C., da Costa, R.S., Sichieri, R. Pereira, R.A. & da Veiga, G.V. (2009). Meal consumption patterns and anthropometric measurements in adolescents from a low socioeconomic neighborhood in the metropolitan area of Rio de Janeiro, Brazil. *Appetite*. 52(3): 735-739.
- Pu, C. & Chou, Y.J. (2010). Health ratings for underweight, overweight and obese adolescents: disparities between adolescents's own report and the parent's report. *Asia Pacific Journal of Clinical Nutrition*. 19(2): 180-187.
- Rajmil, L., Herdman, M., de Sanmamed, M.J.F., Detmar, S., Bruil, J., Ravens-Sieberer, U., Bullinger, M., Simeoni, M.C., & Auquier, P. (2004). Generic health-related quality of life instruments in children and adolescents: a qualitative analysis of content. *Journal of Adolescent Health*. 34(1): 37-45.
- Rahman A.B., Arrifin, N.H., Musa, K.I., Wan Ibrahim, W.P., Ibrahim, M.I., Othman, A., Abdul Aziz, A., Harith, S., Abdul Rahman, N., Van Rostenberghe, H. (2011). A preliminary Study on the Reliability of the Malay Version of the Quality of Life Inventory™ Version 4.0 (PEDSQL) Generic Core Scales among Children with Disabilities in Kelantan, Malaysia: Parent-proxy Report. *International Journal of Collaborative Research on Internal Medicine & Public Health*. 3 (8): 588-596.
- Rajakumar, S., Lim, L.I., Gill, P.K., Goon, W.X., & Kalasalingam, A. (2012). A comparative study of hypertension, diabetes mellitus and obesity among Malaysian in urban regions- A cross-sectional study. *International Journal of Pharmaceutical Sciences and Research*. 3(1): 38-44.
- Ramli, M., Ariff, M.F., & Zaini, Z. (2007). Translation, validation and psychometric properties of Bahasa Malaysia version of the Depression Anxiety and Stress Scales (DASS). *ASEAN Journal of Psychiatry*. 8 (2): 82-89.
- Rani, M.A., Shriram, V. Zacariah, R., Harries, A.D., Satyanarayana, S., Tetali, S., . . . Sathiyasekaran, B. (2012). Does a nutrition education programme change the

knowledge and practice of healthy diets among high school adolescents in Chennai, India. *Health Education Journal*. 72(6): 733-741.

Rasiah, R., & Hassan, O.R. (2011). Poverty and student performance in Malaysia. *International Journal of Institutions and Economies*. 3(1): 61-76.

Ravens-Sieberer, U., & Bullinger, M. (1998). Assessing health-related quality of life in chronically ill children with the German KINDL: first psychometric and content analytic results. *Quality of Life Research*. 7: 399-407.

Ravens-Sieberer, U., Gosch, A., Abel, T., Auquier, P., Bellach, B.M., Bruil, J., Dur, W., Power, M., Rajmil, L., & European, K.G. (2001). Quality of life in children and adolescents: a European public health perspective. *Sozial-und Praventivmedizin*. 46: 294-302.

Ravens-Sieberer, U., Gosch, A., Rajmil, L., Erhart, M., Bruil, J., Duer, W., Auquier, P., Power, M., Abel, T., Czemy, L., Mazur, J., Czimbalmos, A., Tountas, Y., Hagquist, C., & Kilroe, J., Kidscreen Group E. (2005). KIDSCREEN-52 quality of life measure for children and adolescents. *Expert Review of Pharmacoeconomics Outcomes and Research*. 5(3): 353-364.

Ravens-Sieberer, U., Erhart, M., Wille, N., Wetzal, R., Nickel, J., & Bullinger, M. (2006). Generic Health-related Quality of life assessment in children and adolescents: Methodological considerations. *Pharmacoeconomics*. 24: 1199–1220.

Ravens-Sieberer, U., Erhart, M., Wille, N., & Bullinger, M.; BELLA study group. (2008). Health-related quality of life in children and adolescents in Germany; results of the BELLA study. *European Children and Adolescent Psychiatry*. 17(1): 148-156.

Ravussin, E., Burnand, B., Schutz, Y., & Jéquier, E. (1982). Twenty-four-hour energy expenditure and resting metabolic rate in obese, moderately obese, and control subjects. *American Journal of Clinical Nutrition*. 35(3): 566–573.

Reilly, J.J., Methven, E., McDowell, Z.C., Hacking, B., Alexander, D., Stewart, L., & Kelnar, C.J. (2003). Health consequences of obesity. *Archives of Disease in Childhood*. 88: 748-752.

Reinfjell, T., Diseth, TH., Veenstra, M. & Vikan, A. (2006). Measuring health-related quality of life in young adolescents: reliability and validity in the Norwegian version of the Pediatric Quality of Life Inventory 4.0 (PedsQL) generic core scales. *Health and quality of life outcomes*. 4:61-73.

Rejeski, W. J., Shelton, B., Miller, M., Dunn, A. L., King, A. C., & Sallis, J. F. (2001). Mediators of increased physical activity and change in subjective well-being: Results from the Activity Counseling Trial (ACT). *Journal of Health Psychology*. 6(2), 159–168



- Rezali, F.W., Chin, Y.S. & Mohd Yusof, B.N. (2012). Obesity-related behaviors of Malaysian adolescents: a sample from Kajang district of Selangor state. *Nutrition Research and Practice*. 6(5): 458-485.
- Riazi, A., Shakoor, S., Dundas, I., Eiser, C., & McKenzie, S.A. (2010). Health-related quality of life in a clinical sample of obese children and adolescents. *Health and Quality of Life Outcomes*. 8: 134.
- Rolland-Cachera, M. F., Bellisle, F., & Deheeger, M. (2000). Nutritional status and food intake in adolescents living in Western Europe. *European Journal of Clinical Nutrition*. 54: 41-46.
- Rossen, L.M., & Schoendorf, K.C. (2012). Measuring health disparities: trend in racial-ethnic and socioeconomic disparities in obesity among 2-18 year old youth in the United States, 2001-2010. *Annals of Epidemiology*. 22(10): 698-704.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Rubin, B., Gluck, M.E., Knoll, C.M., Lorence, M., & Geliebter, A. (2008). Comparison of eating disorders and body image disturbances between Eastern and Western countries. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*: 13(2): 73-80.
- Russ, S.A., Larson, K., Franke, T.M. & Halfon, N. (2009). Associations between media use and health in US children. *Academy of Pediatrics*. 9:300–306
- Rutishauser, C., Sawyer, S.M., Bond, L., Coffey, C., & Bowes, G. (2001). Development and validation of the Adolescent Asthma Quality of Life Questionnaire (AAQOL). *European Respiration Journal*. 17: 52-58.
- Ryan, M.R., & Deci, E.L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*. 55: 68–78.
- Sabiston, C.M., Sedgwick, W.A., Crocker, P.R.E., Kowalski, K.C., & Mack, D.E. (2007). Social physique anxiety in adolescents: an examination of influences, coping strategies and health behaviours. *Journal of Adolescent Research*. 22: 78–101.
- Sallis, J. F. (2000) Age-related decline in physical activity: a synthesis of human and animal studies. *Medicine & Science in Sports & Exercise*. 32: 1598–1600.
- Santrock, J. W. (2009) *Child Development*. 12th Ed. McGraw-Hill: New York.
- Savage, G., MacFarlane, A., Ball, K., Worsley, A., & Crawford, D. (2007). Snacking behaviours of adolescents and their association with skipping meals. *International Journal of Behavioral Nutrition and Physical Activity*. 4(1): 1-9.

- Schwimmer, J.B., Burwinkle, T.M., & Varni, J.W. (2003). Health-related quality of life of severely obese children and adolescents. *Journal of the American Medical Association*. 28(9): 1813-1819.
- Sebastian, R., Cleveland, L., Goldmad, J. & Moshfegh, A. (2007). Snacking behavior of children and teenagers in the United States. *Federation of American Societies for Experimental Biology*. 20: 189-190.
- Shi, Z., Lien, N., Kumar, B.N., & Holmboe-Ottesen, G. (2005). Socio-demographic differences in food habits and preferences of school adolescents in Jiangsu Province, China. *European Journal of Clinical Nutrition*. 59: 1439-1448.
- Shi, Z., Lien, N., Kumar, B.N., & Holmboe-Ottesen, G. (2006). Perception of weight and associated factors of adolescents in Jiangsu Province, China. *Public Health Nutrition*. 10(3): 298-305.
- Shoup, J. A., Gattshall, M., Dandamudi, P., & Estabrooks, P. (2008). Physical activity, quality of life, and weight status in overweight children. *Quality of Life Research*. 17(3): 407-412.
- Simon, A.E., Chan, K.S., & Forrest C.B. (2008). Assessment of children's health – related quality of life in the United States with a multi-dimensional index. *Pediatrics*. 121: 118-126.
- Singer, M. I., Slovak, K., Frierson, T., & York, P. (1998). Viewing preferences, symptoms of psychological trauma, and violent behaviors among children who watch television. *Journal of the American Academy of Child and Adolescent Psychiatry*. 37: 1041-1048.
- Singh, V., Pal, H.R., Mehta. M., Dwivedi, S.N., & Kapil, U. (2007). Pattern of tobacco use among school children in National Capital Territory (NCT). *Indian Journal of Pediatrics*. 74(11): 1013-1020.
- Sjoberg, A., Hallberg, L., Hoglund, D. & Hulthen, L. (2003). Meal pattern, food choice, nutrient intake and lifestyle factors in The Goteborg Adolescence Study. *European Journal of Clinical Nutrition*. 57:1569-1578.
- Skinner, T.C., Howells, L., Greene, S., Edgar, K., McEvelly, A., & Johansson, A. (2003). Development, reliability and validity of the Diabetes Illness Representations Questionnaire: four studies with adolescents. *Diabetes Medicine*. 20: 283-289.
- Solans, M., Pane, S., Estrada, M.D., Serra-Sutton, V., Berra, S., Herdman, M., Alonso, J., & Rajmil, L. (2008). Health-related quality of life measurement in children and adolescents: a systematic review of generic and disease specific instruments. *Value Health*. 11(4): 742-764.
- Soo, K.L. (2008) *Factors Contributing to Disordered Eating Behaviours and At-Risk of Eating Disorders among Adolescent Girls in Kelantan, Malaysia*. Masters thesis, Universiti Putra Malaysia.



- Stang, J., Kong, A., Story, M., Eisenberg M.E., & Neumark-Sztainer, D. (2007). Food and weight-related patterns and behaviors of among adolescents. *Journal of the American Dietetic Association*. 107: 936-941.
- Stansfeld, S.A., Haines, M.M., Head, J.A., Kamaldeep, B., Viner, R., Taylor, S.J.C., Hillier, S., Klineberg, E. & Booy, R. (2004). Ethnicity, social deprivation and psychological distress in adolescents: School-based epidemiological study in east London. *British Journal of Psychiatry*. 185:233-238.
- Steptoe, A., Wardle, J., Fuller, R., Holte, A., Justo, J., Sanderman, R., & Wichstrom, L. (1997). Leisure-time physical exercise: prevalence, attitudinal correlates, and behavioral correlates among young Europeans from 21 countries. *Preventive Medicine*. 26: 845–854.
- Stice, E., & Whitenton, K. (2002). Risk factors for body dissatisfaction in adolescent girls: A longitudinal investigation. *American Psychological Association*. 38(5): 669-678.
- Straker, L., Smith, A., Hands, A., Olds, T. & Abbott, R. (2013). Screen-based media use clusters are related to other activity behaviours and health indicators in adolescents. *BMC Public Health*. 13:1174
- Stunkard, A. J. & Messick, S. (1985). The three-factor eating questionnaire to measure dietary restraint, disinhibition and hunger. *Journal of Psychosomatic Research*. 29: 71-83.
- Sund, A. M., Larsson, B., & Wichstrom, L. (2003) Psychosocial correlates of depressive symptoms among 12-14-year-old Norwegian adolescents. *Journal of Child Psychology & Psychiatry*. 44: 588-597.
- Ranzenhofer, L.M., Columbo, K.M., Tanofsky-Kraff, M., Shomaker, L.B., Cassidy, O., Matheson, B.E., Kolotkin, R.L., Checchi, J.M., Keil, M., McDuffie, J.R., & Yanovski, J.A. (2012). Binge Eating and Weight-Related Quality of Life in Obese Adolescent. *Nutrients*. 4: 167-180.
- Roszanadia, R., & Norazmir, M.N. (2011). Knowledge, attitude and practice on health eating among special needs boarding school students. *International Journal of Dairy Science*. 6(5): 278-286.
- Serra-Majem, L., García-Closas, R., Ribas, L., Pérez-Rodrigo, C., & Aranceta, J. (2001): Food patterns of Spanish school children and adolescent. The enKid study. *Public Health and Nutrition*. 4: 1433–1438.
- Stern, M., Mazzeo, S.E., Gerke, C.K., Porter, J.S., Bean, M.K. & Laver, J.H. (2007). Gender, ethnicity, psychosocial factors and quality of life among severely overweight, treatment-seeking adolescents. *Journal of Pediatric Psychology*. 32(1): 90-94.
- Sudman, Seymour. 1983. "Applied Sampling." In Handbook of Survey Research, ed. Peter Rossi, James Wright, and Andy Anderson, pp. 145–194. New York: Academic Press.

- Swallen, K.C., Reither, E.N., Haas, S.A. & Meier, A.M. (2005). Overweight, obesity and health-related quality of life among adolescents: the national longitudinal study of adolescent health. *Pediatrics*. 115: 340-347.
- Tammelin, T., Nayha, S., Laitinen, J., Rintamaki, H., & Jarvelin, M.R. (2003). Physical activity and social status in adolescence as predictors of physical inactivity in adulthood. *Preventive Medicine*. 37: 375–381.
- Tan, J.K. (2004). Psychosocial impact of acne vulgaris: evaluating the evidence. *Skin Therapy Letter*. 9(7): 1-3.
- Tanofsky-Kraff, M. (2008). *Binge Eating among Children and Adolescents*. In *Handbook of Child and Adolescent Obesity*. pp. 41–57. Jelalian, E., Steele, R., Eds.; Springer: New York, NY, USA.
- Taylor, J. P., Evers, S., & McKenna, M. (2005). Determinants of healthy eating in children and youth. *Canadian Journal of Public Health- Revue Canadienne De Sante Publique*. 96: 20-26.
- Teo, Y.B., Sedek, R., & Mohd Kasim, Z. (2012). Association between snacking patterns, energy and nutrient intakes, and body mass index among school adolescents in Kuala Lumpur. *American Journal of Food and Nutrition*. 2(3): 69-77.
- Thakur, N., & D'Amico, F. (1999). Relationship of nutrition knowledge and obesity in adolescence. *Family Medicine*. 31(2): 122-127.
- The KIDSCREEN Group Europe: The KIDSCREEN Questionnaires. *Quality of life questionnaires for children and adolescents*. Handbook Lengerich, Pabst Science Publishers, 2006.
- Tozun, M., Unsal, A., Ayrance, U., & Arslan, G. (2010). Prevalence of disordered eating and its impact on quality of life among a group of college students in a province of west Turkey. *Salud Publica Mex*. 52: 190-198.
- Tse, M.M., & Yuen, D.T. (2009). Effects of providing a nutrition education program for teenagers: dietary and physical activity patterns. *Nursing & Health Sciences*. 11: 160–165.
- Tsiros, M.D., Olds, T., Buckley, J.D., Grimshaw, P., Brennan, L., Walkley, J., Hills, A.P., Howe, P.R.C., & Coates, A.M. (2009). Health-related quality of life in obese children and adolescents. *International Journal of Obesity*. 33: 387-400.
- Turconi, G., Celsa, M., Rezzani, C., Biino, G., Sartirana, M.A. & Roggi, C. (2003). Reliability of a dietary questionnaire on food habits, eating behaviour and nutrition knowledge of adolescents. *European Journal of Clinical Nutrition*. 57: 753–763.

- Upton, P., Lawford, J., & Eiser, C. (2008) Parent-child agreement across child health-related quality of life instruments: A review of the literature. *Quality of Life Research*. 17(6): 895–913.
- U. S. Department of Agriculture, Agricultural Research Service. (Accessed June 24, 2012) Data Tables: Results from USDA's 1994–96 Continuing Survey of Food Intakes by Individuals. [http://www.ars.usda.gov/bhnrc/foodsurvey/pdf3yr\\_py.pdf](http://www.ars.usda.gov/bhnrc/foodsurvey/pdf3yr_py.pdf).
- Ussher, M. H., Owen, C. G., Cook, D. G., & Whincup, P. H. (2007). The relationship between physical activity, sedentary behaviour and psychological wellbeing among adolescents. *Social Psychiatry and Psychiatric Epidemiology*. 42(10): 851–856.
- Varni, J.W., & Katz, E.R. (1997). Stress, social support and negative affectivity in children with newly diagnosed cancer: A prospective transactional analysis. *Psycho Oncology*. 6: 267-280.
- Varni, J.W., Seid, M., & Rode, C.A. (1999). The PedsQL: measurement model for the pediatric quality of life inventory. *Medical Care*. 37: 126-139.
- Varni, J.W., Seid, M., & Kurtin, P.S. (2001). PedsQL 4.0: reliability and validity of the Pediatric Quality of Life Inventory version 4.0 generic core scales in healthy and patient populations. *Medical Care*. 39: 800–812.
- Varni, J., Limbers, C., & Burwinkle, T. (2007). Impaired health-related quality of life in children and adolescents with chronic conditions: a comparative analysis of 10 disease clusters and 33 disease categories/severities utilizing the PedsQL™ 4.0 Generic CoreScales. *Health Quality of Life Outcomes*. 5: 43-55.
- Vereecken, C. A., Inchley, J., Subramanian, S. V., Hublet, A., & Maes, L. (2005). The relative influence of individual and contextual socioeconomic status on consumption of fruit and soft drinks among adolescents in Europe. *European Journal of Public Health*. 15(3): 224-232.
- von Rueden, U., Gosch, A., Rajmil, L., Bisegger, C., Ravens-Sieberer, U. & the European KIDSCREEN group. (2006). Socioeconomic determinants of health related quality of life in childhood and adolescence: results from a European study. *Journal of Epidemiology & Community Health*. 60: 130-135.
- Wang, H., Sekine, M., Chen, X., Yaagami, T., & Kagamimori, S. (2008). Lifestyle at 3 years of age and quality of life (QOL) in first-year high school students in Japan: results of the Toyama Birth Cohort Study. *Quality of Life Research*. 17: 257-265.
- Wang, J., Sereika, S.M., Styn, M.A., & Burke, L.E. (2013). Factors associated with health-related quality of life among overweight or obese adults. *Journal of Clinical Nursing*. 22(0): 2172-2182.

- Wendel-Vos, G.C.W., Shuit, A.J., Tjhuis, M.A.R., & Kromhout, D. (2004). Leisure time physical activity and health-related quality of life: Cross-sectional and longitudinal associations. *Quality of Life Research*. 13: 667-677.
- Williams, J., Wake, M., Hesketh, K., Maher, E., & Waters, E. (2005). Health-related quality of life of overweight and obese children. *Journal of the American Medical Association*. 293: 70-76.
- Wille, N., Bullinger, M., Holl, R., Hoffmeister, U., Mann, R., Goldapp, C., Reinehr, T., Westenhofer, J., Egmond-Froehlich, A., & Ravens-Sieberer, U. (2010). Research Health-related quality of life in overweight and obese youths: Results of a multicenter study. *Health and Quality of Life Outcomes*. 8: 36-43.
- WHO. (1948). *Constitution of the World Health Organization: Basic Document*. Geneva, Switzerland.
- WHO. (1993a). *Report of WHOQOL Focus Group Work*. Geneva.
- WHO. (1993b). WHOQOL Study Protocol.
- WHO. (1995). Physical status: *The use and interpretation of anthropometry*. Report of a WHO Expert Committee. Technical Report Series No. 854, World Health Organization, Geneva, Switzerland.
- WHO. (2005). *Nutrition in Adolescence-Issues and Challenges for the Health Sector: Issues in Adolescent Health and Development*. WHO, Geneva.
- WHO [Internet]. Growth reference (5-19 years) [cited 2012 May15]. Available from [http://www.who.int/growthref/who2007\\_bmi\\_for\\_age/en/index.html](http://www.who.int/growthref/who2007_bmi_for_age/en/index.html)
- WHO. Global strategy on diet, physical activity and health [cited 2013 March 17]. Available from <http://www.who.int/dietphysicalactivity/pa/en>
- World Health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization. (1995). *Social Science & Journal*. 41(10): 1403-1409.
- Wu, X.Y., Ohinmaa, A., & Veugelers, P.J. (2011). Diet quality, physical activity, body weight and health-related quality of life among Grade 5 students in Canada. *Public Health Nutrition*. 15(1): 75-81.
- Yaacob, S.N., Juhari, R., Abu Talib, M., & Uba, I. (2009). Loneliness, stress, self-esteem and depression among Malaysian adolescents. *Jurnal Kemusiaan*. 14: 85-95.
- Yasmin, A., & Najeemah, M.Y. (2012). Social Distance and Ethnic Boundary among Pupils in Multiethnic and Monoethnic School Environment in Malaysia. *Science Journal of Sociology and Anthropology*. 2: 1-17.
- Zainuddin, A.A., Manickam, M.A., Baharudin, A., Omar, A., Cheong, S.M., Ambak, R., Hasnan Ahmad, M. & Abdul Ghaffar, S. (2014). Self-perception of body

weight status and weight control practices among adolescents in Malaysia. *Asia-Pacific Journal of Public Health*. 26(5); 18-26.

Zashikhina, A., & Hagglof, B. (2014). Health-related quality of life in adolescents with chronic physical illness in northern Russia: a cross-sectional study. *Health and Quality of Life Outcomes*. 12: 12

Zeller, M.H., & Modi, A.C. (2006). Predictors of health-related quality of life in obese youth. *Obesity*. 14: 122-130.

Zenk, S.N., & Powell, L.M. (2008). US secondary schools and food outlets. *Health & Place*. 14: 336-346.

Zizza, C. & Xu, B. (2012). Snacking is associated with overall diet quality among adults. *Journal of the Academy of Nutrition and Dietetic*. 112(2):291-296.





## LIST OF PUBLICATIONS

### Journal Article

**Sanker K.**, Chin, YS, Fara Wahida R, Woon FC, Hiew CC, Zalilah MS & Mohd Nasir MT. Adolescent self-report and parent proxy-report of health-related quality of life: an analysis of validity and reliability of PedsQL 4.0 among a sample of Malaysian adolescents and their parents. *Health and Quality of Life Outcomes*, 2015.

### Poster Presentations

**Kaartina S.**, Chin YS, Fara Wahida R & Tania, B. Physical activity level among overweight and obese adolescents in Kajang, Selangor. Poster presented at the MASO 2011 Scientific Conference on Obesity “Towards Healthy Weight for Life”, Best western Premier Seri Pacific Hotel, Kuala Lumpur. 28<sup>th</sup>-29<sup>th</sup> June 2011.

**Kaartina S.**, Fara Wahida R, Woon FC, Hiew CC, Chin YS, Zalilah MS, Mohd Nasir MT. Child- and parent-proxy report of health-related quality of life among a sample of Malaysian adolescents: reliability and validity of PedsQL 4.0. Poster presented at the 27<sup>th</sup> Scientific of Nutrition Society of Malaysia (NSM), Crown Plaza Mutiara Hotel. 24<sup>th</sup>-25<sup>th</sup> May 2012.

**Kaartina S.**, Chin YS. The associations between disordered eating, overweight and health-related quality of life among adolescents in Selangor. Poster presented at the 3<sup>rd</sup> International Symposium on Wellness, Healthy Lifestyle and Nutrition. School of Health Sciences, Universiti Sains Malaysia. 12<sup>th</sup>-14<sup>th</sup> December 2012.

**Kaartina S.**, Chin YS, Fara Wahida R, Woon FC, Zalilah MS & Mohd Nasir MT. Association Between Disordered Eating And Health-Related Quality Of Life Among Adolescents In Kuala Lumpur, Malaysia. Poster presented at the 27<sup>th</sup> Scientific of Nutrition Society of Malaysia (NSM), Resaissance Hotel, Kuala Lumpur. 29<sup>th</sup>-30<sup>th</sup> May 2013.

**Kaartina S.**, Chin YS, Fara Wahida R, Woon FC, Zalilah MS & Mohd Nasir MT. Association Between Disordered Eating And Body Weight Status Among Adolescents In Kuala Lumpur, Malaysia. Poster presented at the International Congress of Obesity, Kuala Lumpur Convention Centre. 4<sup>th</sup>-6<sup>th</sup> March 2014.