UNIVERSITI PUTRA MALAYSIA

DEVELOPMENT OF QUESTIONNAIRE FOR ASSESSMENT OF SNACK AND FAST FOOD CONSUMPTION AMONG URBAN CHILDREN AGED 7-9 YEARS

SHARIFAH INTAN ZAINUN BINTI SHARIF ISHAK

FS 2012 69
DEVELOPMENT OF QUESTIONNAIRE FOR ASSESSMENT OF SNACK AND FAST FOOD CONSUMPTION AMONG URBAN CHILDREN AGED 7-9 YEARS

SHARIFAH INTAN ZAINUN BINTI SHARIF ISHAK

MASTER OF SCIENCE
UNIVERSITI PUTRA MALAYSIA

2012
DEVELOPMENT OF QUESTIONNAIRE FOR ASSESSMENT OF SNACK AND FAST FOOD CONSUMPTION AMONG URBAN CHILDREN AGED 7-9 YEARS

By

SHARIFAH INTAN ZAINUN BINTI SHARIF ISHAK

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

December 2012
This thesis is dedicated with deepest love and appreciation to my parents,

Dr. Sharif Ishak Sharif Abdullah

Hamidah Abdullah

Their love and constant prayers have supported me to be the best that I can be
Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

DEVELOPMENT OF QUESTIONNAIRE FOR ASSESSMENT OF SNACK AND FAST FOOD CONSUMPTION AMONG URBAN CHILDREN AGED 7-9 YEARS

By

SHARIFAH INTAN ZAINUN BINTI SHARIF ISHAK

December 2012

Chair : Shamarina Shohaimi, PhD
Faculty : Science

Snack and fast food consumption has been identified in contributing to the development of childhood obesity. To date, there is a lack of valid and reliable food frequency questionnaire (FFQ) for the assessment of these food items in Malaysia. The present study was aimed to develop a validated and reliable FFQ for the assessment of snack and fast food consumption among 7-9 years old urban children. This study was divided into two phases.

Phase 1 which is the development of FFQ using focus group discussions (FGDs) aimed to identify types of snack and fast food usually consumed by children and to develop a preliminary food list for FFQ. A total of 33 children aged 7-9 years old from Selangor and Kuala Lumpur participated in the FGDs. FGDs were audio-taped, transcribed and analyzed. The outcomes showed that the children...
usually consumed snacks such as white bread with spread or as sandwich, local cakes, fruits such as papaya, mango and watermelon, biscuits or cookies, tea, chocolate drink and instant noodle. Their choices of fast food included pizza, burger, French fries and fried chicken. The reasons of the food liking were the taste, their knowledge on the nutritional values and the characteristics of foods. The preliminary food list was prepared which included 49 food items.

Phase 2 is a validity and reliability study of the FFQ conducted in selected schools in Selangor. For face validity, 50 parents were included in the study and the suggestions of the food items to be included in the FFQ were obtained. A total of 67 food items were prepared to be included in the FFQ which consider the parents’ suggestions. To determine the internal validity, we included 424 parents (68.6% mothers) who have completed the FFQ. Out of 67 items, 37 items were retained in the final model. The factor analysis suggested 6 factors that explained 41.84% of the variance. These factors were labelled local fried and savoury snacks, fresh fruits and fruit juice, sweet snacks, sweetened beverages and western-style fast food, bread and bread spread; and cereal-based foods.

Internal consistency reliability, assessed by Cronbach’s alpha (α) for all 37 items was high (α=0.883). All 6 factors showed acceptable reliability which ranged from 0.722 (Factor 2: fresh fruits and fruit juice) to 0.864 (Factor 1: local fried and savoury snacks). Test-retest reliability was determined by using paired t-test.
There were no significant difference of the frequency of food intake between the first and second questionnaires for most of the factors except for Factor 1 (local fried and savoury snacks) and Factor 3 (sweet snacks). This indicated acceptable test-retest reliability and stability of the responses to the items in the FFQ over time. The prevalence of overweight among 424 children was 14.6%. Most of the children have normal weight status (84.9%) and 0.5% underweight. The mean BMI was 16.2 kg/m$^2$.

The developed FFQ has acceptable validity and reliability in urban sample of 7-9 years old school children for the assessment of snack and fast food intake. The FFQ may contribute as one of brief food intake assessment tools specifically for assessing the consumption of snacks and fast food in Malaysian urban children aged 7-9 years old.
Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

PEMBENTUKAN BORANG SOAL SELIDIK UNTUK PENILAIAN PENGAMBILAN SNEK DAN MAKANAN SEGERA DI KALANGAN KANAK-KANAK DI BANDAR BERUMUR 7-9 TAHUN

Oleh

SHARIFAH INTAN ZAINUN BINTI SHARIF ISHAQ

Disember 2012

Pengerusi : Shamarina binti Shohaimi, PhD
Fakulti : Sains


Fasa 1 ialah pembentukan FFQ menggunakan perbincangan kumpulan sasaran (FGDs) bertujuan untuk mengenal pasti jenis snek dan makanan segera yang kerap diambil oleh kanak-kanak dan untuk membentuk senarai makanan awal

Fasa 2 ialah kajian kesahihan dan kebolehpercayaan FFQ di sekolah-sekolah yang terpilih di Selangor. Untuk kesahan muka, 50 ibubapa terlibat dalam kajian ini dan cadangan mengenai jenis makanan untuk dimasukkan ke dalam FFQ telah diperolehi. Untuk mendapatkan kesahan dalaman, kami telah melibatkan 424 ibu bapa (68.6% ibu) yang telah melengkapkan FFQ. Daripada 67 item, 37 item dikekalkan dalam model akhir. Analisis faktor membariskan 6 faktor yang menerangkan 41.84% daripada varians. Faktor-faktor ini telah dilabel snek tempatan bergoreng dan berempah, buah-buahan segar dan jus buahan, snek yang manis, minuman yang manis dan makanan segera barat, roti dan sapuan roti; dan makanan berasaskan bijirin.

Kebolehpercayaan konsistensi dalaman yang ditentukan dengan menggunakan Cronbach alpha (α) untuk semua 37 item adalah tinggi (α=0.883). Kesemua 6
faktor menunjukkan kebolehpercayaan yang memuaskan berjulat dari 0.722 (Faktor 2: buah-buahan segar dan jus buahan) to 0.864 (Faktor 1: snek tempatan bergoreng dan berempah). Kebolehpercayaan ujian semula telah didapati dengan menggunakan ujian t berpasangan. Tiada perbezaan yang signifikan bagi kekerapan pengambilan makanan di antara penilaian pertama dan kedua untuk kebANYakan faktor kecuali Faktor 1 (snek tempatan bergoreng dan berempah) dan FaktOR 3 (snek yang manis). Ini menunjukkan kebolehpercayaan ujian semula dan kestabilan yang memuaskan bagi respon terhadap item di dalam FFQ melawan masa. Prevalensi berat badan berlebihan dalam sampel kajian rentas di kalangan 424 orang kanak-kanak ialah 14.6%. KebANYakan kanak-kanak mempunyai berat badan yang normal (84.9%) dan 0.5% kurang berat badan. Min BMI ialah 16.2 kg/m².

FFQ yang telah dibentuk ini mempunyai kesahihan dan kebolehpercayaan yang memuaskan dalam sampel kanak-kanak berumur 7-9 tahun di kawasan bandar untuk penilaian pengambilan snek dan makanan segera. FFQ ini dapat menyumbang sebagai salah satu daripada alat penilaian pemakanan yang ringkas terutamanya untuk menilai pengambilan snek dan makanan segera bagi kanak-kanak Malaysia berumur 7-9 tahun.
ACKNOWLEDGEMENTS

In the name of ALLAH, the Most Compassionate and Most Merciful

Peace be upon our prophet, Muhammad S.A.W, his family and his companions.

Thank you ALLAH for bestowing His blessing, for giving me great patience and perseverance for enabling me to complete this project. My boundless thanks also go to my beloved parents, Dr. Sharif Ishak Sharif Abdullah and Hamidah Abdullah and my siblings whose constant prayers has given me the driving force and moral support vitally needed to see me through this tough but challenging exercise until completion.

I would like to take this opportunity to express my deepest gratitude and most sincere to my highly respected advisor, Dr. Shamarina Shohaimi, for her advice, guidance, encouragement and contribution to my project. For all the helpful, caring and unselfish attention that you have given to me, I will never forget, Insya ALLAH, and for that, I thank you very much! Also, thanks to my supervisory committee members, Prof. Dr. Mimalini Kandiah and Dr. Isthrinayagy Krishnarajah for all their support and guidance.

I would like to express my sincere thanks and gratitude to Serene Tung En Hui and Wong Yoke Wei for accompany me throughout the study, for all the support and guidance, and for all the time we spend together. Thank you! I also would
like to acknowledge my gratitude to all my friends who are helping in data collection and data key in: Abdul Hafiz Abdul Rahman, Arbaayah Habuan Hanipah, Asma Hajar Abdul Malek, Noorul Hamizah Mat, Nuradiella Yamat Lee, Saniza Sakinah Yusof, Siti Khadijah Che Aun and undergraduate students: Norain Amir, Siti Mariam Jamaludin, Siti Norain Ahmad, Siti Nuratiqah Mahadi and Sulizza Mohammad. Thanks for all your extended help when needed. May ALLAH bless us.

Last but not least, my appreciations also go to Ministry of Education of Malaysia, Department of Education of Selangor and Kuala Lumpur, and headmasters in all participated schools for giving me permission to conduct this study in their institutions. Thanks to all teachers for helping me in data collection and also parents and students who were participated in this study for making this study possible.
I certify that a Thesis Examination Committee has met on 3 December 2012 to conduct the final examination of Sharifah Intan Zainun binti Sharif Ishak on her thesis entitled "Development of questionnaire for assessment of snack and fast food consumption among urban children aged 7-9 years" 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.

Members of the Thesis Examination Committee were as follows:

Nor Azwady bin Abd. Aziz, PhD  
Senior Lecturer  
Faculty of Science  
Universiti Putra Malaysia  
(Chairman)

Chin Yit Siew, PhD  
Senior Lecturer  
Faculty of Medicine and Health Sciences  
Universiti Putra Malaysia  
(Internal Examiner)

Barakatun Nisak binti Mohd. Yusof, PhD  
Senior Lecturer  
Faculty of Medicine and Health Sciences  
Universiti Putra Malaysia  
(Internal Examiner)

Norimah binti A. Karim, PhD  
Professor  
Faculty of Health Sciences  
Universiti Kebangsaan Malaysia  
(External Examiner)

__________________________

SEOW HENG FONG, PhD  
Professor and Deputy Dean  
School of Graduate Studies  
Universiti Putra Malaysia

Date:
This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

**Shamarina binti Shohaimi, PhD**  
Senior Lecturer  
Faculty of Science  
Universiti Putra Malaysia  
(Chairman)

**Isthrinayagy a/p S. Krishnarajah, PhD**  
Senior Lecturer  
Faculty of Science  
Universiti Putra Malaysia  
(Member)

**Mirnalini a/p V.S. Kandiah, PhD**  
Professor  
Faculty of Applied Sciences  
UCSI University  
(Member)

---

**BUJANG BIN KIM HUAT, PhD**  
Professor and Dean  
School of Graduate Studies  
Universiti Putra Malaysia

Date:
DECLARATION

I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.

________________________________________
SHARIFAH INTAN ZAINUN BINTI SHARIF ISHAK

Date: 3 December 2012
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>iii</td>
</tr>
<tr>
<td>ABSTRAK</td>
<td>vi</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>ix</td>
</tr>
<tr>
<td>APPROVAL</td>
<td>x</td>
</tr>
<tr>
<td>DECLARATION</td>
<td>xiii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>xviii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>xx</td>
</tr>
<tr>
<td>LIST OF ABBREVIATIONS</td>
<td>xxi</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>1 INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Background of the Study</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Problem Statement</td>
<td>5</td>
</tr>
<tr>
<td>1.3 Significance of the Study</td>
<td>8</td>
</tr>
<tr>
<td>1.4 Objectives of the Study</td>
<td>9</td>
</tr>
<tr>
<td>2 LITERATURE REVIEW</td>
<td>10</td>
</tr>
<tr>
<td>2.1 Introduction</td>
<td>10</td>
</tr>
<tr>
<td>2.2 Childhood Overweight and Obesity in Malaysia</td>
<td>11</td>
</tr>
<tr>
<td>2.3 Snack and Fast Food</td>
<td>13</td>
</tr>
<tr>
<td>2.3.1 Definition of Snack</td>
<td>13</td>
</tr>
<tr>
<td>2.3.2 Definition of Fast Food</td>
<td>15</td>
</tr>
<tr>
<td>2.4 Snack Intake in Malaysia and Other Countries</td>
<td>16</td>
</tr>
<tr>
<td>2.5 Fast Food Intake in Malaysia and Other Countries</td>
<td>18</td>
</tr>
<tr>
<td>2.6 Relationship between Demographic Status with Snack and Fast Food Intake</td>
<td>20</td>
</tr>
<tr>
<td>2.7 Relationship between Snack and Fast Food Intake with Nutritional Status</td>
<td>22</td>
</tr>
<tr>
<td>2.7.1 Relationship between Snack and Fast Food Intake with Dietary Intake</td>
<td>22</td>
</tr>
<tr>
<td>2.7.2 Relationship between Snack and Fast Food Intake with Body Weight Status</td>
<td>23</td>
</tr>
<tr>
<td>2.8 Dietary Assessment Methods</td>
<td>25</td>
</tr>
<tr>
<td>2.8.1 Food Frequency Questionnaire (FFQ)</td>
<td>25</td>
</tr>
</tbody>
</table>
2.8.2 Dietary Brief Tools or Screeners Developed to Assess Intake of Specific Food Groups

2.9 Validity and Reliability of Developed Dietary Brief Tools and Screeners

3 METHODOLOGY

3.1 Introduction

3.2 Phase 1 – Development of Food Frequency Questionnaire for the Assessment of Snack and Fast Food Consumption

3.2.1 Location and Design of the Study
3.2.2 Sampling Procedures
3.2.3 Respondents and Sample Size
3.2.4 Research Procedures
3.2.5 Data Collection
3.2.6 Research Instruments
3.2.7 Data Analysis

3.3 Phase 2 – Validation and Reliability Study of Food Frequency Questionnaire for the Assessment of Snack and Fast Food Consumption

3.3.1 Location and Design of the Study
3.3.2 Sampling Procedures
3.3.3 Respondents and Sample Size
3.3.4 Research Procedures
3.3.5 Data Collection
3.3.6 Research Instruments
3.3.7 Data Analysis

4 RESULTS

4.1 Introduction

4.2 Phase 1 – Development of Food Frequency Questionnaire for the Assessment of Snack and Fast Food Consumption

4.2.1 Demographic Characteristics of Focus Group Discussions Respondents
4.2.2 Favourite and Non-Favourite Food
4.2.3 Reasons of Food Liking
4.2.4 Consumption of Snack and Fast Food
4.2.5 Knowledge about Snack and Fast Food
4.2.6 Preliminary Food List for the Food Frequency Questionnaire

4.3 Phase 2 – Validation and Reliability Study of Food Frequency Questionnaire for the Assessment of Snack and Fast Food Consumption

4.3.1 Demographic Characteristics of Respondents in Face Validity of Preliminary Food List

4.3.2 Food Frequency Score of Respondents in the Face Validity of Preliminary Food List

4.3.3 Final Food List for the Food Frequency Questionnaire

4.3.4 Demographic Characteristics of Respondents in the Internal Validity, Internal Consistency Reliability and Test-Retest Reliability

4.3.5 Internal Validity of the Food Frequency Questionnaire Food Items

4.3.6 Internal Consistency Reliability of the Food Frequency Questionnaire Food Items

4.3.7 Test-Retest Reliability of the Developed Food Frequency Questionnaire

4.3.8 Food Frequency Score of Respondents of Final Food List for the Food Frequency Questionnaire

5 DISCUSSION

5.1 Phase 1 – Development of Food Frequency Questionnaire for the Assessment of Snack and Fast Food Consumption

5.1.1 Children’s Food Choice and the Reasons of Food Liking

5.1.2 Consumption and Knowledge of Snack and Fast Food

5.2 Phase 2 – Validation and Reliability Study of Food Frequency Questionnaire for the Assessment of Snack and Fast Food Consumption

5.2.1 Demographic Characteristics of Respondents

5.2.2 Internal Validity of the Food Frequency Questionnaire Food Items

5.2.3 Internal Consistency Reliability of the Food
Frequency Questionnaire Food Items
5.2.4 Test-Retest Reliability of the Developed Food Frequency Questionnaire
5.2.5 Snack and Fast Food Consumption among Children

6 CONCLUSION AND RECOMMENDATIONS FOR FUTURE STUDIES
6.1 Conclusion
6.2 Strengths and Limitations of the Study
6.3 Recommendations

REFERENCES
APPENDICES
A Ethical Approval Letter from Medical Research Ethics Committee of Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
B Permission Letter from Ministry of Education, Malaysia
C Permission Letter from Department of Education of Selangor
D Permission Letter from Department of Education of Kuala Lumpur
E Respondent’s Information Sheet and Consent Form
F Facilitator’s Guide for Focus Group Discussions
G Food Frequency Questionnaire for the Assessment of Snack and Fast Food Consumption

BIODATA OF STUDENT
LIST OF PUBLICATIONS