



UNIVERSITI PUTRA MALAYSIA

**FACTORS ASSOCIATED WITH CALCIUM INTAKE AMONG THIRD
TRIMESTER PREGNANT WOMEN IN RAFSANJAN CITY, IRAN**

FATEMEH EBRAHIMI

FPSK(m) 2011 39

**Factors Associated with Calcium Intake Among Third Trimester Pregnant
Women in Rafsanjan City, Iran**

By

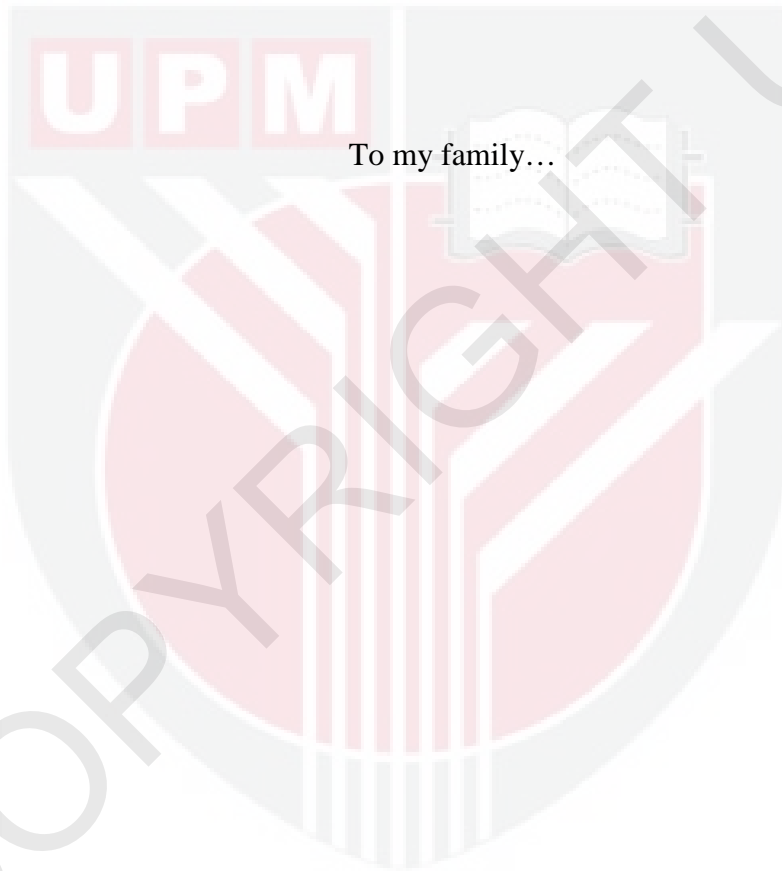
FATEMEH EBRAHIMI

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

March 2011

DEDICATION

To my family...



Abstract of thesis presented to the Senate of Universiti Putra Malaysia, in Fulfilment of the Requirements for Degree of Master of Science

Factors Associated with Calcium Intake Among Third Trimester Pregnant Women in Rafsanjan City, Iran

By

FATEMEH EBRAHIMI

March 2011

Chairman: Assoc. Prof. Zalilah Mohd Shariff, PhD

Faculty: Medicine and Health Sciences

Low calcium intake is recognized as a major public health problem in vulnerable groups, especially pregnant women. Inadequate calcium intake during pregnancy can have adverse health consequences in women and infants. Thus, this cross-sectional study was conducted from June 2009 to September 2009 to determine calcium intake and its associated factors among 308 pregnant women in Rafsanjan city in south east of Iran. The pregnant women were selected via purposive sampling from seven health care centres and they fulfilled the inclusion criteria of Iranian citizen, age between 18-35, in third trimester of pregnancy and have singleton pregnancy. The women were interviewed for demographic and socio-economic, obstetrical, lifestyle and dietary intake information and were measured for weight and height.

The mean age of pregnant women was 26.26 ± 4.70 years and the mean years of schooling was 10.99 ± 3.15 . A majority of the women (89.9%) were housewives and

more than half (54.5%) were having their first pregnancy. The mean pre-pregnancy Body Mass Index (BMI) was 24.62 ± 4.05 kg/m². About 4.2% were underweight and 42.5% were overweight and obese. The mean total weight gain was 12.87 ± 3.59 kg and only 48% of the women gained weight within the recommended range.

The majority of pregnant women (66.6%) had low levels of physical activity. Since all of the women were pregnant, the mean time spent for sitting was the highest (323.21 ± 122.02 min/day).

The mean calorie intake was $2,271 \pm 526.86$ kcal/day. Most of the women (71.4%) did not meet the DRI for calcium intake in third trimester of pregnancy. In addition, a high proportion of these women did not meet the DRI for vitamin A (65.3%), vitamin D (99.1%), magnesium (82.8%), calcium (53.6%), iron (87.2%), zinc (78.9%) and folate (98.1%). The mean total calcium intake of the women was 968.51 ± 363.05 mg/day. About 84.5% of calcium was derived from food and 15.5% derived from calcium supplements. Among this sample of pregnant women, only 46.4% of the pregnant women met the DRI of 1,000 mg for calcium. Milk and dairy products (yogurt, cheese, milk, *doogh*, ice-cream and *kashk*) were made the greatest contributors to calcium intake. Cereals (bread and rice) were the most important non-dairy food sources of calcium.

Comparison of socio-economic, obstetrical and lifestyle factors between pregnant women with adequate and inadequate calcium intake indicated that pregnant women with adequate calcium intake had significantly higher education ($p=0.0001$), household income ($p=0.002$), weight gain ($p=0.001$), energy ($p=0.0001$) and sodium

intake ($p=0.0001$) and lower household size ($p=0.004$), gravidity ($p=0.005$), parity ($p=0.004$), number of children ($p=0.004$) and pre-pregnancy BMI ($p=0.009$) compared to pregnant women with inadequate calcium intake. Factors contributing significantly to calcium intake in pregnant women were education, household income, energy and sodium intake ($R^2=0.646$; $F=138.067$, $p=0.0001$). Higher education, household income, energy and sodium intake were associated with higher calcium intake.

The present study provided an insight into factors that contribute to calcium intake among pregnant women in Rafsanjan city. Appropriate community-based intervention programs should be developed and implemented to address inadequacy of calcium intake among pregnant women in Rafsanjan. The study finding can also be used to strengthen public health strategies that aim to improve nutritional status of pregnant women. It is also recommended that more studies be conducted in Iran to confirm the findings of this study.

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

Faktor Yang Mempengaruhi Pengambilan Kalsium Dikalangan Perempuan Hamil Trimester Ketiga di Kota Rafsanjan, Iran

Oleh

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Mac 2011

Pengerusi: Prof. Madya. Zalilah Mohd Shariff, PhD

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Pengambilan kalsium yang rendah merupakan masalah kesihatan awam yang utama dalam kalangan kumpulan tertentu, terutama ibu mengandung. Kekurangan kalsium semasa mengandung akan memberi kesan kesihatan yang negatif kepada ibu dan bayi di dalam kandungan. Sehubungan dengan itu, kajian keratan rentas telah dijalankan dari Jun 2009 sehingga September 2009 untuk menentukan pengambilan kalsium serta faktor yang berkaitan dengannya dalam kalangan 308 wanita hamil di bandar Rafsanjan di tenggara Iran. Wanita hamil telah dipilih melalui kaedah persampelan bertujuan dari tujuh pusat penjagaan kesihatan dan mereka memenuhi kriteria seperti warganegara Iran, berusia antara 18-35 tahun, berada pada trimester ketiga kehamilan dan mempunyai tunggal. Para wanita ditemubual untuk maklumat demografi dan sosio-ekonomi, obstetrik, aktiviti fizikal, dan pengambilan makanan dan telah diukur berat badan serta tinggi.

Purata usia wanita hamil adalah 26.26 ± 4.70 tahun dan purata tahun persekolahan adalah 10.99 ± 3.15 . Sebahagian besar wanita (89.9%) adalah suri rumah dan lebih dari setengah (54.5%) sedang mengalami kehamilan pertama. Purata Indeks Jisim Tubuh (IJT) sebelum hamil adalah 24.62 ± 4.05 kg/m². Sebanyak 4.2% wanita mempunyai kurang berat badan dan 42.5% adalah berlebihan berat badan serta obes. Purata pertambahan jumlah berat badan adalah 12.87 ± 3.59 kg dan hanya 48% wanita mempunyai bertambah berat badan dalam lingkungan yang disyorkan. Majoriti wanita hamil (66.6%) mempunyai tahap aktiviti fizikal yang rendah. Oleh kerana kesemua wanita itu adalah hamil, purata masa yang dihabiskan untuk duduk mencatat nilai yang tertinggi iaitu 323.21 ± 122.02 minit/hari.

Purata pengambilan kalori adalah $2,271 \pm 526.86$ kkal/hari. Sebahagian besar wanita (71.4%) tidak memenuhi DRI untuk pengambilan kalsium di trimester ketiga kehamilan. Kebanyakan wanita ini juga tidak memenuhi DRI untuk vitamin A (65.3%), vitamin D (99.1%), magnesium (82.8%), kalsium (53.6%), zat besi (87.2%), zink (78.9 %) dan folat (98.1%). Purata pengambilan kalsium bagi wanita hamil ialah 968.51 ± 363.05 mg/hari. Sekitar 84.5% pengambilan kalsium adalah dari makanan dan 15.5% dari suplemen kalsium. Dalam sampel wanita hamil ini, hanya 46.4% sahaja yang memenuhi DRI (1,000) mg untuk kalsium. Susu dan produk tenusu (yoghurt, keju, susu, *doogh*, ais krim dan *kashk*) memberikan sumbangan terbesar untuk pengambilan kalsium. Bijirin (roti dan nasi) adalah sumber bukan tenusu yang paling utama untuk kalsium.

Perbandingan sosio-ekonomi, tahap obesiti dan faktor gaya hidup di antara wanita hamil dengan pengambilan kalsium yang mencukupi dan tidak mencukupi menunjukkan bahawa wanita hamil dengan pengambilan kalsium yang cukup mempunyai pendidikan ($p=0.0001$), pendapatan isi rumah ($p=0.002$), berat badan ($p=0.001$), pengambilan tenaga ($p=0.0001$) dan sodium ($p=0.0001$) yang lebih tinggi tetapi saiz berat badan rumah ($p=0.004$), graviditi ($p=0.005$), pariti ($p=0.004$), bilangan anak ($p=0.004$) dan isi sebelum hamil yang lebih rendah ($p=0.009$) berbanding dengan wanita hamil dengan pengambilan kalsium yang tidak mencukupi. Faktor yang menyumbang secara signifikan terhadap pengambilan kalsium dalam kalangan wanita mengandung adalah pendidikan, pendapatan isi rumah, tenaga dan pengambilan sodium ($R^2=0,646$; $F=138,067$, $p=0.0001$). Pendidikan taraf pendidikan, pendapatan isi rumah, pengambilan tenaga dan sodium adalah berkait rapat dengan pengambilan kalsium yang lebih tinggi.

Penyelidikan ini memberi gambaran mengenai faktor-faktor yang menyumbang kepada pengambilan kalsium dalam kalangan wanita hamil di bandar Rafsanjan. Program intervensi komuniti yang sesuai perlu dibentuk dan dilaksanakan untuk mengatasi masalah kekurangan pengambilan kalsium dalam kalangan wanita hamil di Rafsanjan. Hasil kajian ini juga boleh digunakan untuk memperbaiki status pemakanan wanita hamil. Adalah disyorkan supaya lebih banyak kajian dapat dijalankan di Iran untuk memastikan kesahihan hasil kajian ini.

ACKNOWLEDGEMENT

All praise is due to God, the most merciful and most beneficent, who has guided me, strengthened my heart and never allowed me to give up in all aspects of life. I would like to thank the following people who made this thesis possible and an enjoyable experience for me through their support, contribution, encouragement and assistance. First of all I wish to express my sincere gratitude to my supervisor Associate Professor Zalilah Mohd Shariff, for her generous supervision, patience, enthusiasm, kindness, support and encouragement over the last 24 months. She guided me through this thesis and helped whenever I was in need. Without her help, this work would not be possible. I would like to thank my co-supervisors, Doctor Chan Yoke Mun and Doctor Mohsen Rezaeian for their assistance and their constant willingness to provide any help they could with this thesis.

I would like to extend my gratitude to my wonderful husband Seyed Zia for his patience, encouraging words, calm spirit, never-ending love and unconditional love. I truly could not have been successful in life without him. I gratefully acknowledge the Rafsanjan University of Medical Science for providing the opportunity for me to do this research. I am also indebted to my fellow colleagues (too many to name) in Rafsanjan University of Medical Science for their tireless efforts. Appreciation is also extended to people who participated in the study and gave their valuable time to me. Finally, but importantly, I would like to extend my special gratitude to my daughter yasamin for her understanding, patience and tolerance which has been crucial to the completion of this study.

I certify that a Thesis Examination Committee has met on 14 March 2011 to conduct the final examination of Fatemeh Ebrahimi Ghasemabadi on her thesis entitled “Factors Associated with Calcium Intake Among Third Trimester Pregnant Women in Rafsanjan City, Iran” in accordance with the Universities and University College Act 1971 and 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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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.



FATEMEH EBRAHIMI

Date: 14 March 2011

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