



UNIVERSITI PUTRA MALAYSIA

***FACTORS AFFECTING KNOWLEDGE, ATTITUDE AND PRACTICES
RELATED TO EARLY CHILDHOOD CARIES AMONG MOTHERS OF
ARABIC SCHOOL CHILDREN IN KLANG VALLEY, MALAYSIA***

NAJLA'A SALAMEH MOHAMMED (AL-HARFI AL-BLUWI)

FPSK(M) 2016 9



**FACTORS AFFECTING KNOWLEDGE, ATTITUDE AND PRACTICES
RELATED TO EARLY CHILDHOOD CARIES AMONG MOTHERS OF
ARABIC SCHOOL CHILDREN IN KLANG VALLEY, MALAYSIA**

By:

NAJLA'A SALAMEH MOHAMMED (AL-HARFI AL-BLUWI)

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

March 2016

COPYRIGHT

All material contained within the thesis, including without limitation text, logos, icons, photographs, and all other artwork, is copyright material of Universiti Putra Malaysia unless otherwise stated. Use may be made of any material contained within the thesis for non- commercial purposes from the copyright holder. Commercial use of material may only be made with the express, prior, written permission of Universiti Putra Malaysia.

Copyright © Universiti Putra Malaysia



COPYRIGHT

COPYRIGHT

UPM

DEDICATION

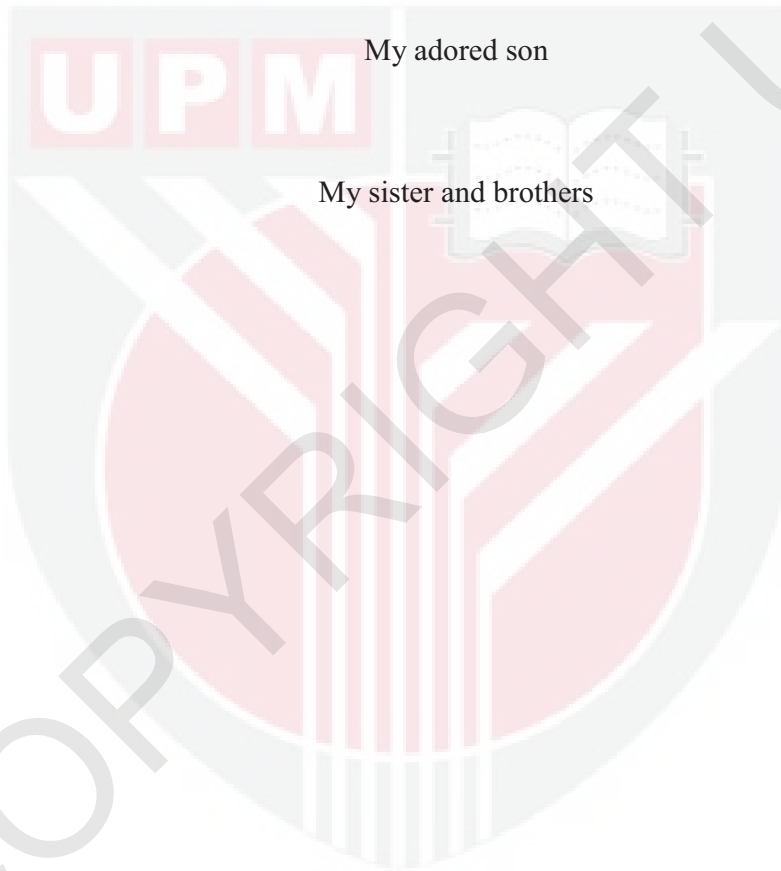
This thesis is dedicated to:

My beloved parents

My dearest husband

My adored son

My sister and brothers



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the Degree of Master of Science

**FACTORS AFFECTING KNOWLEDGE, ATTITUDE AND PRACTICES
RELATED TO EARLY CHILDHOOD CARIES AMONG MOTHERS OF
ARABIC SCHOOL CHILDREN IN KLANG VALLEY, MALAYSIA**

By

NAJLA'A SALAMEH MOHAMMED (AL-HARFI AL-BLUWI)

March 2016

Chairman : Associate Professor Nor Afiah Binti Mohd Zulkefli, PhD
Faculty : Medicine and Health Sciences.

Introduction: Oral health of the child means more than just having good and healthy teeth. Early Childhood Caries (ECC) refers to rampant dental caries in pre-school children. It can affect the child both physically and psychologically. Many factors can affect the knowledge, attitude and practice of mothers about prevention of ECC.

Objectives: To study the knowledge, attitude and practice on ECC and its associated factors among Arabic mothers of preschool and primary school children in Arabic schools that are registered in the Ministry of Education Malaysia in Klang Valley.

Methodology: This was a cross sectional study conducted among 518 mothers of primary and preschool children of all Arabic schools in Klang Valley that are registered with the Ministry of Education Malaysia from December 2014 to February 2015. The mothers were chosen by using simple random sampling. Mothers that fulfilled the inclusion criteria were recruited for the study. Validated and reliable questionnaire were used in this study. Knowledge, attitude and practice were the dependent variables whereas socioeconomic characteristics, tooth care, dental fears and family factors were the independent variables. Chi-square test and binary logistic regression were used for data analysis.

Results: The response rate was 87.6%. The majority of mothers were in the age group between 30 and 39 years old, living in Selangor, married, housewives, and have three to four children. The level of good knowledge on ECC among mothers from this study was 49.1%; positive attitude 46.6% and 37.8% of mothers had good practice on ECC. The predictors of good knowledge on ECC were mothers with >4 children (AOR=3.386; 95% CI: 1.779-6.447), have no fears originating from community believes (AOR=1.575; 95% CI: 1.000-2.480), have no fears of extraction (AOR=2.845; 95% CI: 1.443-5.608), and have twice daily tooth brushing habits (AOR=1.989; 95% CI: 1.266-3.126). Predictors of positive attitude were mothers with post graduate level (AOR=2.024; 95% CI: 1.287-3.184), attended infant oral health education program (AOR=2.444; 95% CI: 1.325-4.506), and good knowledge level (AOR=2.479; 95% CI: 1.600-3.843). On the

other hand, having no fears originating from community believes was a protective factor of positive attitude (AOR=0.575; 95% CI: 0.369-0.896). However, predictors of good practice were mothers with >34 years old (AOR=4.403; 95% CI: 2.009-9.650), attended infant oral health education program (AOR=2.444; 95% CI: 1.085-5.506), good knowledge level (AOR=1.835; 95% CI: 1.093-3.080), and positive attitude level (AOR=4.605; 95% CI: 2.222-9.541).

Conclusion: Majority of mothers' level of good knowledge on ECC, positive attitude towards ECC and good practice on ECC were poor. Preventive programs targeted on mothers who are 34 years old or less, have bachelor degree or less, housewives, with family income less than RM 6000, have four children or less, have not attended any infant oral health education program and have dental fears should be developed.

Keywords: Early Childhood Caries, Mothers, Knowledge, Attitude, Practice.



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

**FAKTOR MEMPENGARUHI PENGETAHUAN, SIKAP DAN AMALAN
TERHADAP KARIES AWAL KANAK-KANAK DI KALANGAN IBU KANAK-
KANAK SEKOLAH ARAB BERDAFTAR DI KLANG VALLEY**

Oleh:

NAJLA'A SALAMEH MOHAMMED (AL-HARFI AL-BLUWI)

Mac 2016

Pengerusi : Profesor Madaya Nor Afiah Binti Mohd Zulkefli, PhD
Fakulti : Perubatan Dan Sains Kesihatan

Pengenalan: Kesihatan oral kanak-kanak bermakna lebih daripada hanya mempunyai gigi yang baik dan sihat. Karies awal kanak-kanak (ECC) adalah karies gigi yang berleluasa pada kanak-kanak pra-sekolah. Ia boleh memberi kesan kepada kanak-kanak dari segi fizikal dan psikologi. Banyak faktor boleh mempengaruhi pengetahuan, sikap dan amalan ibu tentang pencegahan ECC.

Objektif: Mengkaji pengetahuan, sikap dan amalan mengawal ECC dan faktor berkaitan dengan isu ini di kalangan ibu kanak-kanak Arab peringkat pra-sekolah dan sekolah rendah di sekolah Arab yang berdaftar di Kementerian Pendidikan di Klang Valley.

Kaedah: Kaedah yang digunakan adalah kajian analisis keratan rentas merankumi 518 ibu kanak-kanak sekolah rendah dan prasekolah di semua sekolah Arab yang berdaftar di Kementerian Pendidikan di Klang Valley. yang dikumpulkan mulai Disember 2014 hingga Februari 2015. Kajian ini menggunakan soal selidik yang disahkan dan dipercayai. Pengetahuan, sikap dan amalan ialah pembolehubah bersandar manakala ciri-ciri sosio-ekonomi, penjagaan gigi, kebimbangan pergigian dan faktor keluarga merupakan pembolehubah bebas. Chi-kuasa dua dan logistik regresi digunakan untuk menganalisa data.

Hasil: Kadar respon ialah 87.6%. Majoriti kanak-kanak adalah dalam kumpulan umur berusia antara 30 dan 39 tahun, tinggal di Selangor, berkahwin, suri rumah, dan mempunyai 3-4 orang anak. Menurut kajian ini tahap pengetahuan yang baik terhadap (ECC) di kalangan kanak-kanak adalah 49.1%; sikap positif 46.6% dan 37.8% daripada kanak-kanak menunjukkan amalan baik kepada ECC. Peramal pengetahuan yang baik kepada ECC adalah kanak-kanak mempunyai >4 orang anak (AOR=3,386; 95% CI: 1,779-6,447), tidak mempunyai rasa takut yang berasal daripada kepercayaan masyarakat (AOR=1,575; 95% CI: 1,000-2,480), tidak mempunyai rasa takut mencabut gigi (AOR=2,845; 95% CI: 1,443-5,608), dan mempunyai tabiat memberus gigi dua kali sehari (AOR=1,989; 95% CI: 1,266-3,126), (R^2 Nagelkerke ini=0,197). Peramal sikap positif adalah kanak-kanak di peringkat pasca siswazah (AOR=2,024; 95% CI: 1,287-

3,184), yang menghadiri program pendidikan kesihatan oral bayi (AOR=2,444; 95% CI: 1,325-4,506), dan tahap pengetahuan am yang baik (AOR=2,479; 95% CI: 1,600-3,843). Sebaliknya, tidak mempunyai rasa takut yang berasal daripada kepercayaan masyarakat merupakan faktor pelindung sikap positif (AOR=0,575; 95% CI: 0,369-0,896), (R^2 Nagelkerke ini=0,155). Walau bagaimanapun, peramal amalan baik adalah kanak-kanak dalam golongan >34 tahun (AOR=4,403; 95% CI: 2,009-9,650), telah menghadiri program pendidikan kesihatan oral bayi (AOR =2,444; 95% CI: 1,085-5,506), mempunyai tahap pengetahuan yang baik (AOR=1,835; 95% CI: 1,093-3,080), dan tahap sikap yang positif (AOR=4,605; 95% CI: 2,222-9,541).

Kesimpulan: Majoriti ibu tidak mempunyai tahap pengetahuan yang baik mengenai ECC, mereka tidak mempunyai sikap yang positif terhadap ECC dan tahap amalan baik ECC adalah lemah. Program pencegahan harus menasarkankan ibu muda yang berumur 34 tahun ke bawah, mencapai tahap sarjana muda atau kurang, suri rumah, mempunyai pendapatan keluarga kurang daripada RM 6000, mempunyai empat anak atau kurang, tidak menghadiri sebarang program oral pendidikan kesihatan bayi dan rasa takut mengenai isu pergigian .

Kata kunci: Karies Awal Kanak-kanak, Ibu, Pengetahuan, Sikap, Amalan.

ACKNOWLEDGEMENTS

All grace and thanks belongs to Almighty Allah for giving me the strength, courage, and determination for completing this work.

I would like to express my sincere gratitude to my supervisor Associate Professor Dr. Nor Afiah Binti Mohd Zulkefli for her guidance, advice and encouragement in the completion of this study. Her continues professional review helped me in improving the thesis.

Special thanks dedicated to my supervisory committee member Dr. Hayati binti Kadir@Shahar for the valuable comments and suggestions during the preparation of this thesis.

Special thanks to my beloved husband Eng. Abdulrahman Wasfi Odeh for being very understanding and encouraging. He always believes in me more than I believe in myself. In fact, words cannot express my thanks and gratitude for his support.

I am proud and grateful to my father Professor Dr. Salameh Mohammed Al-Bluwi, my mother Dr. Abla Jawad Al-Hersh, for their advices, continuous motivation and encouragements throughout my journey in my studies.

Last but not least I truly appreciate the commands of my brothers Dr. Qutaiba Al-Bluwi, Dr. Ibrahim Al-Bluwi, Eng. Tariq Al-Bluwi, and my sister Dr. Ghada Al-Bluwi.

I certify that a Thesis Examination Committee has met on 24 March 2016 to conduct the final examination of Najla'a Salameh M. (Alharfi Albluwi) on her thesis entitled "Factors Affecting Knowledge, Attitude and Practices Related to Early Childhood Caries among Mothers of Arabic School Children in Klang Valley, Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

Members of the Thesis Examination Committee were as follows:

Ahmad Azuhairi Ariffin, PhD

Senior Lecturer
Faculty of Medicine and Health Science
Universiti Putra Malaysia
(Chairman)

Hejar binti Abd. Rahman, PhD

Associate Professor
Faculty of Medicine and Health Science
Universiti Putra Malaysia
(Internal Examiner)

Farizah Mohd Hairi, PhD

Associate Professor
University of Malaya
Malaysia
(External Examiner)



ZULKARNAIN ZAINAL, PhD

Professor and Deputy Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 25 May 2016

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Masters of Science. The members of the supervisory committee were as follows:

Nor Afiah Binti Mohd Zulkefli, B. Med. Sc, MD, M. Community Health, Ph.D

Associate professor

Faculty of Medicine and health sciences

Universiti Putra Malaysia

(Chairman)

**Hayati binti Kadir@Shahar, MBBchBAO, M.Community Health
(Epidemiology & Biostatistics)**

Medical Lecturer

Faculty of Medicine and health sciences

Universiti Putra Malaysia

(Member)

BUJANG BIN KIM HUAT, PhD

Professor and Dean

School of Graduate Studies

Universiti Putra Malaysia

Date:

Declaration by graduate student

I hereby confirm that:

- this thesis is my original work
- quotations, illustrations and citations have been duly referenced
- the thesis has not been submitted previously or concurrently for any other degree at any institutions
- intellectual property from the thesis and copyright of thesis are fully-owned by Universiti Putra Malaysia, as according to the Universiti Putra Malaysia (Research) Rules 2012;
- written permission must be owned from supervisor and deputy vice –chancellor (Research and innovation) before thesis is published (in the form of written, printed or in electronic form) including books, journals, modules, proceedings, popular writings, seminar papers, manuscripts, posters, reports, lecture notes, learning modules or any other materials as stated in the Universiti Putra Malaysia (Research) Rules 2012;
- there is no plagiarism or data falsification/fabrication in the thesis, and scholarly integrity is upheld as according to the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) and the Universiti Putra Malaysia (Research) Rules 2012. The thesis has undergone plagiarism detection software

Signature: _____ Date: _____

Name and Matric No: Najla'a Salameh (Al-Harfi Al-Bluwi) , GS37931

Declaration by Members of Supervisory Committee

This is to confirm that:

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

Signature: _____

Name of
Chairman of
Supervisory
Committee:

Associate Professor
Dr. Nor Afiah Binti Mohd Zulkeflib

Signature: _____

Name of
Member of
Supervisory
Committee:

Dr. Hayati binti Kadir

TABLE OF CONTENTS

	Page
ABSTRACT	i
ABSTRAK	iii
ACKNOWLEDGMENTS	v
APPROVAL	vi
DECLARATION	viii
LIST OF TABLES	xiv
LIST OF FIGURES	xvi
LIST OF APPENDICES	xvii
LIST OF ABBREVIATIONS	xviii
CHAPTER	
1 INTRODUCTION	1
1.1 Background	1
1.2 Problem Statement	3
1.3 Significance of the Study	4
1.4 Research Problem	4
1.5 Objectives	4
1.5.1 General Objective	4
1.5.2 Specific Objectives	4
1.6 Research Hypothesis	5
2 LITERATURE REVIEW	6
2.1 Early Childhood Caries	6
2.2 Tooth Anatomy and Dental Caries Pathophysiology	6
2.3 Sequence of Teeth at Risk of Early Childhood Caries	7
2.4 Prevalence of Early Childhood Caries	8
2.5 Diagnosis of Early Childhood Caries	9
2.6 Factors Associated with Early Childhood Caries	9
2.6.1 Multifactorial Factors	9
2.6.2 Biological Factors	9
2.6.3 Behavioural Factors	10
2.6.4 Socio- Economic Factors	10
2.6.5 Clinical Factors	10
2.6.6 Child's Characteristics and Temperaments	11
2.7 Prevention of Early Childhood Caries	11
2.7.1 Dental Oral Health Education Programs	11
2.7.1.1 Oral Health Education Programs in Malaysia	12
2.7.2 Screening of Oral Health by Oral Health Providers	13
2.7.3 Treatment of Early Childhood Caries	13
2.8 Dental Care Services	14
2.9 Mothers' Role in Preventing Early Childhood Caries	14
2.10 Implications of Early Childhood Caries	15
2.11 Ethnic Minorities in Oral Health Issues	16
2.12 Arabs and Arabic World	17
2.13 Arabs and Arabic Schools in Malaysia	17
2.14 Knowledge, Attitude and Practice on Early Childhood Caries	18
2.14.1 Definitions and Objectives	18

2.14.2	Knowledge on Early Childhood Caries	18
2.14.3	Sources of Knowledge on Early Childhood Caries	19
2.14.4	Attitude towards Early Childhood Caries	19
2.14.5	Practice on Early Childhood Caries	20
2.14.6	Barriers to Early Childhood Caries Good Practice	21
2.15	Factors Affecting Knowledge, Attitude and Practice on Early Childhood Caries	21
2.15.1	Socio-demographic Characteristics	21
2.15.2	Education Programs	24
2.15.3	Dental Fears	26
2.15.4	Tooth Care	27
2.15.5	Family Factors	27
2.16	Associations between Knowledge, Attitude, and Practice	28
2.17	Conceptual Framework	29
3	METHODOLOGY	31
3.1	Study Location	31
3.2	Study Design	31
3.3	Study Duration	31
3.4	Sampling	31
3.4.1	Study Population	31
3.4.2	Study Sample	31
3.4.3	Sampling Unit	31
3.4.4	Sampling Frame	31
3.4.5	Sample Size	32
3.4.6	Sampling Technique	33
3.4.7	Inclusion Criteria	33
3.4.8	Exclusion criteria	33
3.5	Variables	33
3.5.1	Dependant variables	33
3.5.2	Independent variables	33
3.6	Instrumentation	34
3.7	Quality Control	36
3.7.1	Validity of the Questionnaire	36
3.7.2	Reliability of the Questionnaire	36
3.8	Data Collection	36
3.9	Operational Definitions	37
3.9.1	General Terms	37
3.9.2	Dependent Variables	38
3.9.3	Independent Variables	38
3.10	Data Analysis	40
3.11	Ethical Considerations	41
4	RESULTS	42
4.1	Socio-demographic Characteristics	42
4.1.1	Age of the Mother	42
4.1.2	Nationality	43
4.1.3	Area of Residence	44
4.1.4	Education level	44
4.1.5	Marital Status	44
4.1.6	Occupation	45
4.1.7	Family Income	45

4.1.8	Number of Offspring	45
4.2	Education Programs on ECC	46
4.2.1	Programme Attendance on ECC	46
4.2.2	Number of Education Programs on ECC Taken	47
4.2.3	Countries' Name in which Infant Oral Health Education on ECC had been taken	47
4.2.4	Types of Programs on ECC taken by the Respondents	48
4.3	Dental Fears	49
4.4	Family Factors	49
4.5	Tooth Care	50
4.6	Knowledge on ECC	50
4.7	Sources of Knowledge on ECC of the Respondents	53
4.8	Attitude towards ECC	53
4.9	Practice on ECC	56
4.10	Barriers to ECC Good Practice	58
4.11	Factors Associated with the Level of Knowledge on ECC of Respondents	58
4.11.1	Socio-demographic Characteristics	58
4.11.2	Education Programs on ECC	59
4.11.3	Dental Fears	60
4.11.4	Tooth Care	60
4.12	Factors Associated with Attitude on ECC of Respondents	61
4.12.1	Socio-demographic Characteristics	61
4.12.2	Education Programs on ECC	62
4.12.3	Dental Fears	63
4.13	Factors Associated with Level of Practice on ECC of Respondents	63
4.13.1	Socio-demographic Characteristics	63
4.13.2	Education Programs on ECC	65
4.13.3	Family Factors	65
4.14	Associations between Level of Knowledge, Level of Attitude and Level of Practice on ECC	66
4.15	Predictors of Good Knowledge on ECC of Respondents	67
4.16	Predictors of Positive Attitude towards ECC of Respondents	70
4.17	Predictors of Good Practice on ECC of Respondents	72
5	DISCUSSION	75
5.1	Introduction	75
5.2	Level of Knowledge on ECC	75
5.3	Sources of Knowledge on ECC	76
5.4	Socio- demographic Characteristics and Knowledge Level on ECC	76
5.4.1	Age of the Mother	76
5.4.2	Education Level	77
5.4.3	Occupation	78
5.4.4	Family Income	78
5.4.5	Number of Offspring	79
5.5	Education Programs and Knowledge Level on ECC	79
5.6	Dental Fears and Knowledge Level on ECC	80
5.7	Tooth Care and Knowledge Level on ECC	80
5.7.1	Dental Visits	80
5.7.2	Tooth Brushing	81
5.8	Level of Attitude towards ECC	82
5.9	Socio- demographic Characteristics and Attitude Level towards ECC	82

5.9.1	Age of the Mother	82
5.9.2	Education Level	83
5.9.3	Occupation	83
5.9.4	Family Income	84
5.9.5	Number of Offspring	84
5.10	Education Programs and Attitude Level towards ECC	85
5.11	Dental Fears and Attitude Level towards ECC	85
5.12	Knowledge Level on ECC and Attitude Level towards ECC	86
5.13	Practice on ECC	87
5.14	Barriers to Good Practice on ECC	87
5.15	Socio- demographic Characteristics and Practice Level on ECC	88
5.15.1	Age of the mother	88
5.15.2	Education Level	89
5.15.3	Marital Status	89
5.15.4	Occupation	90
5.15.5	Family Income	90
5.15.6	Number of Offspring	91
5.16	Education Programs and Practice Level on ECC	91
5.17	Family Factors and Practice Level on ECC	92
5.18	Knowledge Level on ECC and Practice Level on ECC	93
5.19	Attitude Level towards ECC and Practice Level on ECC	94
6	CONCLUSIONS AND RECOMMENDATIONS	95
6.1	Conclusion	95
6.2	Limitations	95
6.3	Recommendations	96
6.3.1	Research	96
6.3.2	Service Focus	96
	BIBLIOGRAPHY	99
	APPENDICES	113
	BIODATA OF STUDENT	139

LIST OF TABLES

Table	Page
4.1 Distribution of nationalities of respondents (N=421)	44
4.2 Socio-demographic characteristics of respondents (N=454)	46
4.3 Distribution of countries in which programs on ECC have been taken by respondents (N=421)	48
4.4 Distribution of respondents' answers on dental fears	49
4.5 Distribution of respondents' answers on family factors	50
4.6 Distribution of respondents' answers on tooth care (N=454)	50
4.7 Respondents' level of knowledge on ECC (N=446)	51
4.8 Distribution of respondents' answers regarding knowledge on ECC	52
4.9 Distribution of respondents' sources of knowledge on ECC (N=453)	53
4.10 Respondents' level of attitude towards ECC (N=440)	54
4.11 Distribution of respondents' answers regarding attitudes towards ECC	55
4.12 Respondents' level of practice on ECC (N=439)	57
4.13 Distribution of respondents' answers regarding practice on ECC	57
4.14 Distribution of respondents' barriers to good practice on ECC (N=452)	58
4.15 Association between socio-demographic characteristics and level of knowledge on ECC of respondents	59
4.16 Association between education programs and level of knowledge on ECC of respondents	60
4.17 Association between dental fears and level of knowledge on ECC of respondents	60
4.18 Association between tooth care and level of knowledge on ECC of respondents	61
4.19 Association between socio-demographic characteristics and level of attitude towards ECC of respondents	62
4.20 Association between education programs and level of attitude towards ECC of respondents	63

4.21	Association between dental fears and level of attitude towards ECC of respondents	63
4.22	Association between socio-demographic characteristics and level of practice on ECC of respondents	64
4.23	Association between education programs and level of practice on ECC of respondents	65
4.24	Association between family factors and level of practice on ECC of respondents	66
4.25	Association between level of knowledge and level of attitude with level of practice on ECC of respondents	67
4.26	Association between level of knowledge and level of attitude on ECC of respondents	67
4.27	Logistic regression analysis for good knowledge on ECC of respondents	68
4.28	Logistic Regression analysis for positive attitude towards ECC of respondent	71
4.29	Logistic regression analysis for good practice on ECC of respondents	73

LIST OF FIGURES

Figure		Page
2.1	Sequence of teeth at risk of ECC	8
2.2	Conceptual framework of factors associated with knowledge, attitude and practice on Early Childhood Caries (ECC)	30
4.1	Distribution of respondents' age	43
4.2	Distribution of respondents' number of offspring	45
4.3	Distribution of number of education programs on ECC taken by respondents	47
4.4	Percentages of types of oral health education programs on ECC taken by respondents	49
4.5	Normal distribution of knowledge scores on ECC of respondents	51
4.6	Normal distribution of attitude scores towards ECC of respondents	54
4.7	Normal distribution of practice scores on ECC of respondents	56
4.8	ROC curve on good level of knowledge	69
4.9	ROC curve on positive level of attitude	72
4.10	ROC curve on good level of practice	74

LIST OF APPENDICES

Appendix		Page
A1	Questionnaire, Information Sheet and Consent Form (Arabic)	113
A2	Questionnaire, Information Sheet and Consent Form (English)	123
B	Approval Letter from the Ethics Committee involving Human Subjects of University Putra Malaysia (JKEUPM)	133
C1	Approval Letter from School (1 and 2)	135
C2	Approval Letter from School (3)	136
C3	Approval Letter from School (4)	137
C4	Approval Letter from School (5)	138

LIST OF ABBREVIATIONS

AOR	Adjusted Odd Ratio
β	Beta
CI	Confidence Interval
Df	Degree of Freedom
DMFT score	Decayed Missing Filled Teeth score
ECC	Early Childhood Caries
Exp(B)	Exponentiation of the β coefficient
IDR	Incidence Density Ratios
KAP	Knowledge, Attitude and Practice
MOH	Ministry of Health
RM	Ringgit Malaysia
ROC curve	Receiver Operating Characteristic curve
SE	Standard Error
S-ECC	Severe Early Childhood Caries
UAE	United Arab Emirates
WHO	World Health Organization
WP	Wilayah Persekutuan
χ^2	Chi-square

CHAPTER 1

INTRODUCTION

1.1 Background

Early Childhood Caries (ECC) is relatively a new term. It refers to rampant dental caries in pre-school children (Tinanoff, & O'Sullivan, 1997). ECC is defined as the presence of one or more decayed (noncavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child age 71 months of age or younger (Guideline on Caries-risk Assessment and Management for Infants Children and Adolescents, 2013).

ECC is the most widespread chronic disease in children (Douglass, Douglass, & Silk, 2004). It is a serious health problem in both developing and developed countries (Livny, Assali, & Sgan-Cohen, 2007). Up till now, ECC is considered to be at epidemic proportions in the developing countries. For instance, in Syria, Lebanon, Egypt, and the United Arab Emirates the prevalence of ECC was found to be between 31% and 74% (Abu Hamila, 2013; Qadri, Nourallah, & Splieth, 2012; Chedid, Bourgeois, & Kaloustian, 2011; Hashim, Williams, & Thomson, 2011). In Malaysia the figure is alarming, this is because the national oral health surveys showed that the prevalence of ECC of five year-old and a six-year-old pre-school children was found to be 74.5% in 2007 (Oral Health Division, 2009).

Many factors contribute to ECC. Commonly caries risk factors are grouped into five groups; Biological, behavioural, socio-economic, clinical risk factors and child's temperaments. Biological factors include cariogenic bacteria levels, and the level of caries activity of the mother. The behavioural factors include sugar intake, food practices, night time bottle feeding, and frequent breastfeeding. However, socio-economic factors include family income, education level of the parents, and minority status. Moreover, clinical factors include the presence of plaque, and enamel defects (Çolak, Dülgergil, Dalli, & Hamidi, 2013). On the other hand, Child's temperaments include innate personality or behavioural style (Quinonez, Santos, Wilson, & Cross, 2001).

A multi-factorial approach is required for preventing ECC. This multi-factorial approach stresses on the role of health care providers to provide mothers with good dietary practice guidelines. In addition, it emphasises the importance of educational programs. Dental health programs have shown to be determining factors in the improvement of dental health standards (Kirtilogu, & Yavuz, 2006; Al Banyan, Echeverri, Narendran, & Keene, 2000). Moreover, mothers also play an important role in this multifactorial approach (Robert, 2014).

In general, many factors influence the knowledge, attitude and practice of mothers on ECC. Socio demographic characteristics of mothers such as age of the mother (Jain,

Oswal, & Chitguppi, 2014), marital status (Murshid, 2006), ethnicity, area of residence (Williams, White, & Gatrell, 2002), education level, family income (Jain et al., 2014) occupation (Attas, 2007) and number of offspring were found to affect mothers' knowledge attitude and practice on ECC. Knowledge, attitude and practice (KAP) was also shown to be linked to education programs (Ramazani, Zareban, Ahmad, & ZadSirjan, et al., 2014), dental fears (Akpabio, Klausner, & Inglehart, 2008), tooth care (Ru-Shing, Shun-Te, Hong-Sen, & Szu-Yu et al., 2014), and family factors (Chhabra, & Chhabra, 2012).

Treatment of ECC is essential and can be accomplished through different types of intervention. The type of the intervention depends on the progression of the disease, the age of the child, along with the social, behavioural, and medical history of the child (Çolak et al., 2013).

Nationwide nearly 6.1% of youngsters have unmet dental needs compared to 1.9% who have unmet need for medical care (Waldman, 1998). In Malaysia in the year 2007, the utilization of oral health care facilities was 19.7% (Ministry of Health Malaysia, 2007). In the Arabic world, the access and the utilization of health and oral health services continue to be a serious concern to the health care systems of the Arab countries (Kronfol, 2012).

ECC can affect the child both physically and psychologically. The short term consequences of ECC may include pain, infection, sleep disturbance and the susceptibility to malocclusion. On the other hand, some of the long term consequences include the continuity of poor oral health and dental disease from childhood to adulthood and the succeeding permanent dentition. Moreover, ECC can lead to impairment in the child's general health, leading to insufficient physical development especially in height and weight (Çolak et al., 2013).

Migrant and minor communities' health is becoming a worldwide public-health issue. According to the International Organization for Migration (IOM) around 192 million people are living outside their place of birth (López-Acuña, 2008). In Malaysia the immigrant forms around 8.3% from the total Malaysian population (International Organization for Migration, 2013). Human migration refers to "The movement of a person or a group of persons, either across an international border, or within a state. It is a population movement, encompassing any kind of movement of people, whatever its length, composition and causes; it includes migration of refugees, displaced persons, economic migrants, and persons moving for other purposes, including family reunification" (International organization for migration, 2014).

It is always said that maintaining migrants' health needs is very challenging (Daher, Ibrahim, Daher, & Anbori, 2011). This might be because a lot of countries would put some restriction to the access to health care for migrants groups (Kullgren, 2003). For instance in Malaysia the government hospitals provide health treatments for

foreigners but with charges that are twice as much as the local rate (Ministry of Health Malaysia, 2013; Rescue.org, 2012). Furthermore, migrants seeking health care face communication obstacles with health professionals (Timmins, 2002).

The aim of this study is to determine the knowledge, attitude and practices and its associated factors of a community on ECC among Arabic school children's mothers in Arabic schools that are registered in the Ministry of Education in Klang Valley.

1.2 Problem Statement

ECC is the most widespread chronic disease in children. The prevalence of ECC has exceeded 70% of preschool children both in Malaysia and some Arabic countries such as Syria and Lebanon (Qadri et al, 2012; Chedid et al., 2011; Oral Health Division, 2009; Oral Health Division, 2007).

The number of Arabic population who are living in Malaysia is increasing every year. Studies show that maintaining migrants' health needs is very challenging (Daher et al., 2011). Multiple countries such as Switzerland, and Taiwan are showing that children with migrant background have higher caries prevalence rate than those without migrant background (Menghini, Steiner, Thomet, & Roos et al., 2008; Lin, Yen, Chang, & Ting et al., 2014). However, the data in Malaysia is limited. The oral health of Arabic young children in Malaysia will have implications on the child, the community the child is living in, as well as the health-care providers.

ECC has a serious short and long term consequences that can affect the child physical and psychological wellbeing. Children with ECC are prone to future caries development (Almeida, Roseman, Sheff, & Huntington et al., 2000) and other serious manifestations such as pain, infection, speech and communication problems, poor nutrition, reduced productivity, poor quality of life, both in childhood and adulthood, and financial expenses (Çolak et al., 2013).

Preschool children cannot control their own oral health. Parents are considered the main caretakers of their offspring. Many children acquire dental diseases and suffer from consequences because of their parents. Parents oral health knowledge, attitudes and practices are directly associated to the oral health of their children (Primosch, 2001).

There are many factors able to influence the KAP of the mothers on oral health of the children such as socio demographic characteristics of mothers (Jain et al., 2014), education programs (Ramazani et al., 2014), dental fears (Akpabio et al., 2008), tooth care (Ru-Shing et al., 2014), and family factors (Chhabra, & Chhabra, 2012). Until today, there is no KAP study on ECC done on the Arabic community who are living in Malaysia.

1.3 Significance of the Study

Parents' awareness is found to play a major role in preventing ECC (Almeida et al., 2000). Mothers' role is critical. Studies show that fathers cannot achieve all of the roles required to provide a complete home environment care for their children compared to mothers (Robert, 2014).

A study of knowledge, attitude and practice on ECC and its associations among Arabic school children's mothers in Arabic schools that are registered in the Ministry of Education in Klang Valley can generate valuable base line information on those three levels and their factors. As a result, findings of this study can be used in future researches or intervention programs targeting Arabic community in Malaysia.

1.4 Research Problem

The research problem is: What are the factors affecting knowledge, attitude and practice of ECC among registered Arabic school children's mothers in Klang Valley?

1.5 Objectives

1.5.1 General Objective

To study the knowledge, attitude and practice on Early Childhood Caries (ECC) and its associated factors of Arabic mothers of preschool and primary school children in Arabic schools that are registered in the Ministry of Education in Klang Valley.

1.5.2 Specific Objectives

1. To determine the socio demographic factors, education programs, dental fears, tooth care, family factors, knowledge, attitude level and level of practice on ECC of the respondents.
2. To identify the source of information on ECC and barriers for good practice on prevention of ECC of the respondents.
3. To determine the association between socio demographic factors and the level of knowledge, attitude and practice on ECC of the respondents.
4. To determine the association between education programs and the level of knowledge, attitude, and practice of the respondents.
5. To determine the association between dental fears and the level of knowledge and attitude on ECC of the respondents.
6. To determine the association between tooth care and the level of knowledge on ECC of the respondents.
7. To determine the association between family factors and the level of practice on ECC of the respondents.
8. To determine the associations between level of knowledge, level of attitude and level of practice on ECC of the respondents.

9. To determine the predictors of good knowledge, positive attitude and good practice on ECC of the respondents.

1.6 Research Hypothesis

1. There is a significant association between socio demographic factors, education programs, dental fears and tooth care with the level of knowledge on ECC of the respondents.
2. There is a significant association between socio demographic factors, education programs and dental fears with the level of attitude towards ECC of the respondents.
3. There is a significant association between socio demographic factors, education programs and family factors with the level of practice on ECC of the respondents.
4. There is a significant association between level of knowledge and the level of attitude on ECC of the respondents.
5. There is a significant association between level of knowledge and the level of attitude with the level of practice on ECC of the respondents.

BIBLIOGRAPHY

- Abu Hamila, N. (2013). Early Childhood Caries and Certain Risk Factors in a Sample of Children 1.3-5 Years in Tanta. *Dentistry*, 4(1), 180.
- Adair, M.P., Pie, C.M., Burnside, G., & Nicol, A.D. (2004). Familial and cultural perceptions and beliefs of oral hygiene and dietary practices among ethnically and socio-economically diverse groups. *Community Dental Health*, 21, 102–111
- Adeniyi, A., Ogunbodede, O., Jeboda, O., & Folayan, O. (2009). Do Maternal Factors Influence the Dental Health Status of Nigerian Pre School Children? *Int J Paediatr Dent*, 19 (6), 448-454.
- Akpabio , A., Klausner, C . P., & Inglehart , M. R. (2008). Mothers' / guardians' knowledge about promoting children's oral health. *American Dental Hygienists Association*, 82(1), 12-12.
- Al-Banyan, R.A., Echeverri, E.A., Narendran, S., & Keene, H.J. (2000). Oral health survey of 5-12- year old children of Nation Guard employees in Riyadh, Saudi Arabia. *Inter J Paediatric Den*, 10(1), 39-45.
- Al-Hussyeen . (2006). Child's dental visits, oral health, knowledge and source of dental information among mothers of children with Down's Syndrome in Riyadh. *Saudi Dental Journal*, 18(1), 8-17.
- Aljamal, Y. (2015). Dreaming in Arabic: Malaysia celebrates Arabic language. Middle East Eye. Retrieved from <http://www.middleeasteye.net/in-depth/features/dreaming-arabic-malaysia-celebrates-arabic-language-and-culture-1300036389> (accessed March. 2016).
- Al-Kheraif, A., & Al Bejadi, S. (2008). Oral hygiene awareness among female Saudi school children. *Saudi Medical Journal*, 29(9).
- Almeida, A. G., Roseman, M., Sheff, M., Huntington, N., & Hughes, C. V. (2000). Future caries susceptibility in children with early childhood caries following treatment under general anesthesia. *Pediatric dentistry*, 22(4), 302-306.
- Alshehri, V .S., & Nasim , V . S. (2015) . Infant Oral Healthcare Knowledge and and Awareness among Parentsin Abha city of Aseer Region, Saudi Arabia. *The Saudi Journal of Dental Research*. In press. <http://dx.doi.org/10.1016/j.sjdr.2015.01.001>.
- Al- Zahrani, A. M., Al-Mushayt, A.S., Otaibi, M. F., & Wyne, A. H. (2014). Knowledge and attitude of Saudi mothers towards their preschool children's oral health. *Pak J Med Sci*, 30(4), 720–724.
- Al-Sane M., Montero M., Abd-Alsalam M., & Koerber A. Sources of Infant Oral

Health Knowledge (IOH) Among Expectant Mothers. Paper presented at IADR General Session, California. March 2011.

Al-Shahloob, A, (2013). Salaries for house wives. *Al-Riyad Economy Newspaper*. Retrieved from <http://www.alriyadh.com/2013/02/18/article811098.html>

Al-Shalan, T. (2003). Factors affecting Saudi parents' perception of their children's first dental visit. *Journal Of Contemporary Dental Practice*, 4(4), 1-8.

Al-Shenawi, S. (2011). Project of Live, Learn, and Smile: A New Campaign to Improve Oral Health. *Al- Bayan Today Newspaper*. Retrieved from <http://www.maghress.com /bayanealyaoume/15370> (accessed September.2014)

American - Arab Anti-Discrimination Committee, A.D.C, (1990). Facts about Arabs and the Arabic world. Retrieved from <http://www.adc.org/index.php?id=248> (2014) (accessed October. 2014)

American-Arab Anti-Discrimination Committee. (2015). About Arabs and the Arabic World. Washington DC. Retrieved from <http://www.adc.org/index.php?id=248> (accessed September. 2014)

American Academy of Pediatric Dentistry. (2006). Symposium on the prevention of oral disease in children and adolescents. Chicago, Ill; November 11-12, 2005: Conference papers. *Pediatr Dent*, 28(2), 96-198.

Aminabadi, N.A., Ghoreishizadeh, A., Ghoreishizadeh, M., & Oskouei, S.G. (2014). Can child temperament be related to early childhood caries?. *Caries Res*. 48(1), 3-12

Amin, M., & Perez, A. (2012). Is the wait-for-patient-to-come approach suitable for African newcomers to Alberta, Canada?. *Community Dentistry and Oral Epidemiology*, 40 (6), 523–531.

Arabic League online. (2014). Presentation of the Arabic league. Retrieved from <http://www.arableagueonline.org/> (accessed March. 2016).

Ashkanani , F., & Al-Sane, M. (2012) . Knowledge, attitudes and practices of caregivers in relation to oral health of preschool children. *Medical Principles and Practice*, 22(2), 167-172.

Attas , S. (2007). The effect of socio - demographic factors on the oral health knowledge, attitudes and behaviour in a female population. *SDJ*, 19(1), 27-35

Baginska, J., & Rodakowska, E. (2012). Knowledge and practice of caries prevention in mothers from Bialystok, Poland. *International Journal of Collaborative Research on Internal Medicine & Public Health*, 4(4), 256- 266.

Bahri, N., Iliati, H.R., Sajjadi, M., & Bo-loochi, T. (2012). Effects of oral and dental health edu-cation program on knowledge, attitude and short-time practice of pregnant women (Mashhad-Iran). *J Mash Dent Sch*, 36, 1–12.

- Bertness, J., & Holt, K. (2004). Promoting Awareness, Preventing Pain: Facts on Early Childhood Caries (ECC). *National Maternal and Child Oral Health Resource Center: Georgetown University*.
- Bahadori, M., Ravangard, R., Asghari, B., & Shiraz, I. (2013). Perceived Barriers Affecting Access to Preventive Dental Services: Application of DEMATEL Method. *Iranian Red Crescent Medical Journal*, 15(8), 655-662.
- Bamanikar, S., & Kee, L.K. (2013). Knowledge, Attitude and Practice of Oral and Dental Healthcare in Pregnant Women. *Oman Med J*, 28(4), 288–291.
- Bleich, S. N., Wang, Y.C., Wang, Y., & Gortmaker, S.L. (2009). Increasing consumption of sugar-sweetened beverages among US adults: 1988-1994 to 1999-2004. *Am J Clin Nutr*, 89(1), 372-381.
- Blinkhorn, A., Gratrix, D., Holloway, P., Wainwright -Stringer, Y., Ward, S., & Worthington, H. (2003). A cluster randomised, controlled trial of the value of dental health educators in general dental practice. *British dental journal*, 195(7), 395-400.
- Bowen, S. (2002). Language Barriers in Access to Health Care, Health Canada, Ottawa, Canada. Retrieved from http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2001-lang-acces/2001-lang-acces-eng.pdf (accessed November. 2014)
- Buerlein, J.K., Horowitz, A. M., & Child, W. L. (2011). Perspectives of Maryland women regarding oral health during pregnancy and early childhood. *Journal of Public Health Dentistry*, 71(2): 131-135.
- Bursac, Z., Gauss, C. H., Williams, D. K., & Hosmer, D. W. (2008). Purposeful selection of variables in logistic regression. *Biol Med*, 3: 17.
- Cardenas, L.M., & Ross, D.D. (2010). Effects of an oral health education program for pregnant women. *J Tenn Dent Assoc*, 90:23–26
- Carroll, J. (2007). Americans: 2.5 Children Is "Ideal" Family Size. Retrieved from <http://www.gallup.com/poll/27973/americans-25-children-ideal-familysize.aspx> x Gallup News Service.
- Chacko, V., Shenoy, R., Prasy, H. E., & Agarwal, S. (2013). Self-reported Awareness of Oral Health and Infant Oral Health among Pregnant Women in Mangalore, India- A Prenatal Survey. *International Journal of Health and Rehabilitation Sciences (IJHRS)*, 2(2), 109-115.
- Chedid, N., Bourgeois, D., Kaloustian, H., Baba, N., & Pilipili, C. (2011). Caries prevalence and caries risk in a sample of Lebanese preschool children. *Odonto Stomatologie Tropicale*, 34(134), 31.
- Chen, C., Chiou, S., Ting, C., Lin, Y., Hsu, C., Chen, F.,... Huang, H.L. (2014).

Immigrant-native differences in caries-related knowledge, attitude, and oral health behaviors: a cross-sectional study in Taiwan. *BMC Oral Health*, 14:3

Chermside Paediatric Dental Care. (2007). Tooth enamel defects. Retrieved from <http://www.dentist4kids.com.au/ToothEnamelDefects/tabid/71/Default.aspx>
Crest Center. (2014) (accessed September. 2014)

Chhabra, N., & Chhabra, A. (2012). Parental knowledge, attitudes and cultural beliefs regarding oral health and dental care of preschool children in an Indian population: a quantitative study. *Eur Arch Paediatr Dent*, 13(2), 76-82.

Cho, E., & Kim, S. (2015). Cronbach's Coefficient Alpha: Well Known but Poorly Understood. *Organizational Research Methods*, 18, 207-230

Claessen, J.P., Bates, S., Sherlock, K. Seeparsand, F. & Wright, R. (2008). Designing interventions to improve tooth brushing. *International Dental Journal*, 58.

Çolak, H., Dülgergil, Ç. T., Dalli, M., & Hamidi, M. M. (2013). Early childhood caries update: A review of causes, diagnoses, and treatments. *Journal of natural science, biology, and medicine*, 4(1), 29-35.

Colleen, E.H., & Christine, A.R. Behavioral Determinants of Brushing Young Children's Teeth: Implications for Anticipatory Guidance. *Pediatr Dent*, 32(1), 48-55.

Columbia University college of Dental medicine. (2012). All about cavities. Retrieved from http://www.simplestepsdental.com/SS/ihtSS/r.==/st.31845/t.32653/pr.3.html#How_Your_Teeth_Decay (accessed December. 2013)

Cramer, D. (1998). *Fundamental statistics for social researcher*. London: Routledge.

Cramer, D., & Howitt, D. (2004). *The SAGE dictionary of statistics*. London: SAGE.

Daher, A.M., Ibrahim, H.S., Daher, T.M., & Anbori, A.K. (2011). Health related quality of life among Iraqi immigrants settled in Malaysia. *BMC Public Health*, 11, 407.

Daly, B., Clarke, W., McEvoy, W., Periam, K., & Zoitopoulos, L. (2010). Child oral health concerns amongst parents and primary care givers in a Sure Start Local Programme. *Comm Dental Health*, 27, 167-171.

Das, N., Chattopadhyay, D., Chakraborty, S., & Dasgupta, A. (2013). Infant and Young Child Feeding Perceptions and Practices among Mothers in a Rural Area of West Bengal, India. *Ann Med Health Sci Res*, 3(3), 370-375.

Declerck, D., Leroy, R., Martens, L., Lesaffre, E., Garcia-Zattera, M. J., Broucke, S. V., & Hoppenbrouwers, K. (2008). Factors associated with prevalence and severity of caries experience in preschool children. *Community dentistry and oral epidemiology*, 36(2), 168-178.

- Dimitrova, M.M., (2009). A study of pregnant women's knowledge of children's feeding practice as a risk factor for early childhood caries. *Folia Med (Plovdiv)*, 51, 40–5.
- Doane, D.P., & Seward, L.E. (2011). Measuring Skewness. *Journal of Statistics Education*, 19(2), 1-18.
- Douglass, J. M., Douglass, A. B., & Silk, H. J. (2004). A practical guide to infant oral health. *American Family Physician*, 70(11), 2113.
- Dwight, F. (2011). Arab folklore: a handbook. Retrieved from <http://www.elahdath.net/index.php/social/32251.html> (accessed March 2015).
- Dye, B.A., Tan, S., Smith, V., Lewis, B.J., Barker, L.K., Thornton-Evans, G., Eke, P.I.,... Li, C.H. (2007). Trends in oral health status: United States, 1988–1994 and 1999–2004. *Vital Health Stat*, 11 (248), 1–92.
- Dutta - Bergman, M.J.(2004). Reaching unhealthy eaters: applying a strategic approach to media vehicle choice. *Health Commun*, 16(4), 493–506.
- Eigbobo, J.O., Aikins, E.A., & Onyeaso, C.O. (2013). Knowledge of preventive child oral healthcare among expectant mothers in Port Harcourt, Nigeria. *Pediatric Dental Journal*, 23(1), 1–7
- Elfhag, K., Tholin, S., & Rasmussen, F. (2008). Consumption of fruit, vegetables, sweets and soft drinks are associated with psychological dimensions of eating behavior in parents and their 12-year-old children. *Public Health Nutr*, 11(9), 914-923.
- Elison, S., Norgate, S., Dugdill, L., & Pine, C. (2014). Maternally Perceived Barriers to and Facilitators of Establishing and Maintaining Tooth-Brushing Routines with Infants and Preschoolers. *Int J Environ Res Public Health*, 11(7), 6808–6826.
- Farid, H., Khan, F.R., & Aman. N. (2013). Knowledge, attitude and practice of mothers regarding their own and children's dental health a tertiary care hospital based study. *J Ayub Med*, 25(3-4)
- Finlayson, T.L., Siefert, K., Ismail, A.I., & Sohn, W.(2007). Maternal self-efficacy and 1-5-year-old children's brushing habits. *Community Dent Oral Epidemiol*, 35(4), 272-81.
- Flores, G. (2006). Language barriers to health care in the United States. *New England Journal of Medicine*, 355(3), 229-231.
- Folakemi, O., Maarufah, A., Oladipo, A., & Onajole, A. (2014). Assessment of Mothers' Oral Health Knowledge: Towards Oral Health Promotion for Infants and Children. *Scientific Research and Academic Publishing*, 6 (10), 908
- Frank, R.A. (1993). *The role of the primary caregiving father*. Unpublished doctoral

dissertation, Loyola University of Chicago, United States of America.

Frenkel, H., Harvey, I., & Needs, K. (2002). Oral health care education and its effect on caregivers' knowledge and attitudes: A randomised controlled trial. *Community Dent Oral Epidemiol*, 30, 91–100.

Frishkopf, & Michael (2010). "Introduction: Music and media. in the Arab world and Music and media in the Arab world as music and media in the Arab world: A metadiscourse" In Frishkopf, Michael. Music and media in the Arab world. Cairo: The American University in Cairo Press. ISBN 978-977-416-293-0.

Frost, J. (2013). Regression Analysis: How Do I Interpret R-squared and Assess the Goodness-of-Fit? The Minitab Blog. Retrieved from <http://blog.minitab.com/blog/adventures-in-statistics/regression-analysis-how-do-i-interpret-r-squared-and-assess-the-goodness-of-fit>

Green, B., N. (2001). Reform in Public Health Education in Chiropractic. *Top Clin Chiropr*. 8(4):27–41.

Guideline on Caries –risk Assessment and Management for Infants Children , and Adolescents. (2013). Council on clinical affairs: American Academy Of Pediatric Dentistry.

Gussy, M., Waters, E., Riggs, E., Lo, S., & Kilpatrick, N. (2008). Parental knowledge, beliefs and behaviours for oral health of toddlers residing in rural Victoria. *Australian dental journal*, 53(1), 52-60.

HajiKazemi, E., Mohseni, S.H.H., & Oskouie, F., & Haghani, H. (2005). The association between knowledge, attitude and performance in pregnant women towards dental hygiene during pregnancy. *Iran Journal of Nursing*, 18 (43), 31-38.

Harris, R., Nicoll, A.D., Adair, P.M., & Pine, C.M. (2004). Risk factors for dental caries in young children: a systematic review of the literature. *Community Dent Health*, 21(1), 71-85.

Hashim, R., Williams, S., & Thomson, W.M. (2011). Severe early childhood caries and behavioural risk indicators among young children in Ajman, United Arab Emirates. *European Archives of Paediatric Dentistry*, 12(4), 205-210.

Hilton, I. V., Stephen, S., Barker, J. C., & Weintraub, J. A. (2007). Cultural factors and children's oral health care: a qualitative study of carers of young children. *Community dentistry and oral epidemiology*, 35(6), 429-438.

Hoefl, K.S., Masterson, E.E., & Barker, J.C. (2009). Mex-ican American mothers' initiation and under-standing of home oral hygiene for young children. *Pediatr Dent*, 31, 395 – 404.

Hooley, M., Skouteris, H., Boganin, C., Satur, J., & Kilpatrick, N. (2012). Parental

influence and the development of dental caries in children aged 0-6 years: a systematic review of the *literature* , 40(11), 873-85

Hättinger, B. (2009). The League of Arab States. In Norderstedt. Germany. *Introduction* (pp, 2). GRIN Verlag

Huebner, C. E., & Riedy, C. A. (2010). Behavioral determinants of brushing young children's teeth: implications for anticipatory guidance. *Pediatric dentistry*, 32(1), 48.

Iben, P., Kanellis , M.J., & Warren, J. (2000). Appointment- keeping behaviour of Medicaid enrolled pediatric dental patients in eastern Iowa. *Pediatr Dent*, 22(4), 325-329.

International organization for migration. International Migration Law: Glossary on Migration. Page 62 (2014). Retrieved from <http://publications.iom.int/bookstore/free/Glossary%20nd%20ed%20web.pdf>

International Organization for Migration, (2013). Malaysia, <http://www.iom.int/cms/en/sites/iom/home/where-we-work/asia-and-the-pacific/malaysia.html>

Jackson, R. (2006). Parental health literacy and children's dental health: implications for the future. *Pediatric dentistry*, 28(1), 72-75.

Jain, R., Oswal, K.C., & Chitguppi, R. (2014). Knowledge, attitude and practices of mothers toward their children's oral health: A questionnaire survey among subpopulation in Mumbai (India). *Journal of Dental Research and Scientific Development*, 1(2).

Jennifer , E., Baez,A., Angier, H., & Krois, A. (2007). Insurance plus Access Does not Equal Health Care: Typology of Barriers to Health Care Access for Low-Income Families. *Ann Fam Med*, 5(6), 511-518.

Kaliyaperumal K., *Guideline for Conducting a Knowledge, Attitude and Practice (KAP) Study*. Rotary Aravind International Eye Bank: India. 2004.

Khera, B. (2013). Wahran launches the campaign of preventing early childhood caries in milk teeth: Under the supervision of 100 specialized dentists. *Al-Ahdath*, Retrieved from <http://www.elahdath.net/social/32251.html> (accessed December. 2013).

Kirtilogu, T., & Yavuz, U.S. (2006). An assessment of oral self-care in the student population of a Turkish university. *Public health*, 120, 953-957.

Kowash, M., Pinfield, A., Smith, J., & Curzon, M. (2000). Dental health education: effectiveness on oral health of a long-term health education programme for mothers with young children. *British dental journal*, 188(4), 201-205.

Kronfol, N.M. (2012). Access and barriers to health care delivery in the Arab

- countries: a review. *Eastern Mediterranean Health Journal*, 18(12), 1239-1246.
- Kullgren, J. T. (2003). Restrictions on undocumented immigrants' access to health services: the public health implications of welfare reform. *American Journal of Public Health*, 93(10), 1630-1633.
- Kressin, N.R., Nunn, M.E., Singh, H., Orner, M.B., Pbert, L., Hayes, C., Culler, C.,... Henshaw, M.M. (2009). Pediatric clinicians can help reduce rates of early childhood caries: effects of a practice based intervention. *Med Care*, 47(11):1121-8.
- Larson, N. , & Story, M. (2008). Food and Beverage Marketing to Children and Adolescents: What Changes are Needed to Promote Healthy Eating Habits? A Research Brief. *Healthy Eating Research. A National Program of the Robert Wood Johnson Foundation*. Retrieved from <http://healthyeatingresearch.org/wp-content/uploads/2013/12/HER-Food-Mktg-Brief-2008-FINAL.pdf> (accessed December. 2014)
- League of the Arabic states, Geeral Secretary. *Arab Countries Figures and Indicators*. Cario: Second Edition. 2010.
- Lin, Y.C., Yen, Y.Y., Chang, C.S., Ting, C.C., Chen, P.H., Chen, C.C., Peng, W.D.,... Huang, H.L. (2014). Oral health disparities of children among south east Asian immigrant women in arranged transnational marriages in Taiwan. *Caries Res*, 48(6), 575- 583.
- Livny, A., Assali, R. and Sgan-Cohen, H. D. (2007). Early Childhood Caries among a Bedouin community residing in the eastern outskirts of Jerusalem. *BMC Public Health*, 7(1), 1-7.
- López-Acuña, D. (2008). Overcoming migrants' barriers to health. *Bulletin of the World Health Organization*, 86(8): 583-584.
- Lydon-Rochelle, M. T., Krakowiak, P., Hujuel, P. P., & Peters, R. M. (2004). Dental care use and self-reported dental problems in relation to pregnancy. *American Journal of Public Health*, 94(5), 765-771
- Mani, S., Aziz, A., John, J. & Ismail, N. (2010). Knowledge, attitude and practice of oral health promoting factors among caretakers of children attending day-care centers in Kubang Kerian, Malaysia: A preliminary study. *Journal of Indian Society of Pedodontics and Preventive Dentistry*, 28(2), 78-83.
- Mani, S. A., John, J., Ping, W. Y., & Ismail, N. M. (2012). Oral Health Care– Paediatric, Research, Epidemiology and Clinical Practice. *Early Childhood Caries: Parent's Knowledge, Attitude and Practice Towards Its Prevention in Malaysia* (pp. 1-17). CC BY 3.0 license.
- Mansfield, C.J., Kirk, D., Curry, M., & Bobbitt-Cooke, M. (2001). The Challenge

of Eliminating Health Disparities in North Carolina. *North Carolina Medical Journal*, 62(1), 19-25.

Mariño, R., Calache, H., Wright, C., Schofield, M., & Minichiello, V. (2004). Oral health promotion programme for older migrant adults. *Gerodontology*, 21, 216–25

Mattila, M.L., Rautava, P., Sillanpaa, M., & Paunio, P. (2000). Caries in 5 year-old children and associations with family related factors. *J Dent Res* 2000 Mar, 79(3), 875-881

Mayo, C. (2014). Single parent ? Tips for raising a child alone . Retrieved from <http://www.mayoclinic.org/healthy-lifestyle/childrens-health/in-depth/single-parent/art-20046774> (accessed January. 2015)

Monde, D., M. (2011). The KAP Survey Model Knowledge, Attitudes, and Practices. Retrieved From <https://www.spring-nutrition.org/publications/tool-summaries/kap-survey-model-knowledge-attitudes-and-practices> (accessed December. 2014)

Menghini, G., Steiner, M., Thomet, E., Roos, M. & Imfeld, T. (2008). Caries prevalence in 2-year-old children in the city of Zurich. *Community Den Health*, 25(3), 154-160.

Milnes, AR. (1996). Description and epidemiology of nursing caries. *J Public Health Dent*, 56(1), 38-54.

Mitrakul, K., Laovoravit, V., Vanichanuwat, V., Charatchaiwanna, A., Charatchaiwanna, A., Bunpradit, W. and Arunakul, M. (2012). Factors associated with parent capability on child's oral health care. *Southeast Asian Journal of Tropical Medicine and Public Health*, 43(1), 249.

Ministry of Health Malaysia, *Health Information Management System (HIMS) Report*. Government printers: Kuala Lumpur. 2007. Ministry of health Malaysia , Official Portal, (2013). Government Hospitals' Treatment. Charges for Foreigners. Retrieved from http://www.moh.gov.my/v/ch_fo (accessed February. 2014)

Moallemi, Z.S., Virtanen, J.I., Ghofranipour, F., & Murtomaa, H. (2008). Influence of mothers' oral health knowledge and attitudes on their children's dental health. *European Archives of Paediatric Dentistry*, 9 (2).

Muhammad, S., Shyama, M., and Al-Mutawa, S.A. (2011). Parental attitude toward behavioral management techniques in dental practice with school children in Kuwait. *Med Princ Pract*, 20, 350-355.

Murshid, E. (2006). Infant feeding practices of Saudi mothers in five different regions of Saudi Arabia. *SDJ*. 18(2), 78-85.

Nagaraj, A., Pareek, S . (2012) . Infant Oral Health Knowledge and Awareness:

Disparity among Pregnant Women and Mothers visiting a Government Health Care Organization. *Int J Clin Pediatr Dent*, 5(3), 167-172.

Nagarajappa, R., Kakatkar, G., Sharda, A.J., Asawa, K., Ramesh, G., & Sandesh N. (2013). Infant oral health: Knowledge, attitude and practices of parents in Udaipur. India. *Dent Res J (Isfahan)*, 10, 659–665.

Naidu, R., Nunn, J., & Forde, M. (2012). Oral healthcare of preschool children in Trinidad: a qualitative study of parents and caregivers. *BMC Oral Health*, 12, 27

Nakre, P.D., & Harikiran, A.G. (2013). Effectiveness of oral health education programs: A systematic review. *J Int Soc Prev Community Dent*, 3(2), 103–115.

Norton, D., Froelicher, E., Waters, C., & Carrieri-Kohlman, V. (2003). Parental influence on models of primary prevention of cardiovascular disease in children. *Eur J Cardiovasc Nurs*, 2(3), 11-22.

Oliveira, A., Chaves, A., & Rosenblatt, A. (2006). The influence of enamel defects on the development of early childhood caries in a population with low socioeconomic status: a longitudinal study. *Caries research*, 40(4), 296-302.

Oral Health Division, Ministry of Health Malaysia. *Oral healthcare for antenatal mothers*. Government printers: Kuala Lumpur. 2004.

Oral Health Division, Ministry of Health Malaysia. *The National Oral Health Survey of Preschool Children 2005 (NOHPS 2005)*. Government printers: Kuala Lumpur. 2007.

Oral Health Division, Ministry of Health Malaysia. *Guidelines Early Childhood Oral Healthcare*. Government printers: Kuala Lumpur. 2008.

Oral Health Division, Ministry of Health Malaysia. *National Oral Health Survey of School Children 2007 (NOHSS 2007)*. Government printers: Kuala Lumpur. 2009.

Oral Health Division, Ministry of Health Malaysia. *National Oral Health Plan (Nohp) for Malaysia 2011-2020*. Government printers: Kuala Lumpur. 2011.

Oral Health Division, Ministry of Health Malaysia. *Management of severe early childhood caries*. Government printers: Kuala Lumpur. 2012.

Paradis, H.A., Conn, K.M., Gewirtz, J.R., & Hal-terman, J.S. (2011). Innovative delivery of newborn anticipatory guidance: a randomized, con-trolled trial incorporating media-based learn-ing into primary care. *Acad Pediatr*, 11, 27–33.

Păsăreanu, M., Rotaru, D., & Balan, A. (2008). The mothers role in feeding and

supervising the early childhood oral dental hygiene. *Journal of Preventive Medicine*, 16(1-2), 116-124.

Phelan, C. (2006). The Blue Book Oral Health Program: a collaborative partnership with statewide implications. *Health Promotion Journal of Australia*, 17(2), 109-113.

Pimsleur Approach. (2016). Cuisines of Arabia. Retrieved from <http://www.pimsleurapproach.com/resources/arabic/articles/cuisines-of-arabia/> (accessed March, 2016)

Pine. (2004). Barriers to the treatment of childhood caries perceived by dentists working in other countries. *Community Dent Health*, 21(1), 112-120.

Poutanen, R., Lahti, S, Tolvanen, M., & Hausen, H. (2006). Parental influence on children's oral health-related behavior. *Acta Odontol Scand*, 64, 286-292.

Primosch, RE., Balsewich, CM. & Thomas, CW. (2001). Outcomes assessment an intervention strategy to improve parental compliance to follow-up after treatment of early childhood caries using general anesthesia in a Medicaid population. *ASDC J Dent Child*, 68(2), 102-107.

Prowse, S., Schroth, R. J., Wilson, A., Edwards, J. M., Sarson, J., Levi, J. A., & Moffatt, M. E. (2014). Diversity Considerations for Promoting Early Childhood Oral Health: A Pilot Study. *International Journal of Dentistry*. doi:10.1155/2014/175084

Qadri, G., Nourallah, A., & Splieth, C. H. (2012). Early childhood caries and feeding practices in kindergarten children. *Quintessence international (Berlin, Germany: 1985)*, 43(6), 503.

Quinonez R., Santos, G.R, Wilson, S., & Cross H. (2001). The relationship between child temperament and early childhood caries. *Pediatric Dentistry*, 23, 5-10

Ramazani, N., Zareban, I., Ahmad, R., ZadSirjan, S., & Daryaeian, M. (2014). Effect of Anticipatory Guidance Presentation Methods on the Knowledge and Attitude of Pregnant Women Relative to Maternal, Infant and Toddler's Oral Health Care *Journal of Dentistry, Tehran University of Medical Sciences, Tehran, Iran* 11(1).

Raji, R., & Vaibhav, V. (2012). Review article. Maternal Factors and Child Oral Health. *International Journal of Health Sciences & Research*, 2(8), 102.

Reang, T., & Bhattacharjya, H. (2014). Mother's knowledge and practice regarding oral hygiene and challenges in the prevention of dental caries of under-five children in an urban resettlement colony. *Int J Med Sci Public Health*, 3(1), 76-80.

Rescue . org , *In Search for Survival and Sanctuary in the City : Refugees from Myanmar/ Burma in Kuala Lumpur Malaysia*. Peter Biro. 2012.

- Retnakumari, N., & Cyriac, G. (2012). Childhood caries as influenced by maternal and child characteristics in pre-school children of Kerala-an epidemiological study. *Contemp Clin Dent*, 3(1), 2–8.
- Rich, S. (2010). Negative Attitude: Causes, Consequences And Cures. Retrieved from <http://simonarich.com/negative-attitude>
- Robert A. V, (2014). Parental Role. Retrieved from <http://www.springerreference.com/docs/html/chapterdbid/3027.html> Carol R.E and Melvin E (accessed February. 2014).
- Rothe, V., Kebriyai, A., Pitner, S., Balluff, M., & Salama F. (2006). Effectiveness of a presentation on infant oral healthcare for parents. *Int J Paediatric Dent*, 20, 37 – 42.
- Ru-Shing, T. Shun-Te, H., Hong-Sen, C. Szu-Yu, H., Hsin-Yu, H., & Fu-Hsung, C. (2014). The association between oral hygiene behavior and knowledge of caregivers of children with severe early childhood caries. *Journal of Dental Sciences*, 9(3), 277-282
- Rwakatema, D. (2009). Oral health knowledge, attitudes and practices of parents/guardians of pre-school children in Moshi, Tanzania. *East African Medical Journal*, 86(11), 520-525.
- Saddki, N., Yusoff, A., & Hwang, Y. L. (2010). Factors associated with dental visit and barriers to utilisation of oral health care services in a sample of antenatal mothers in Hospital Universiti Sains Malaysia. *BMC Public Health*, 10(1), 75.
- Shaker, N.Z., Hussein, K. A., & AL-Azzawi, S.I.I. (2009). Knowledge, Attitude and Practices (KAP) of Mothers toward Infant and Young Child Feeding in Primary Health Care (PHC) Centers, Erbil City. Retrieved from <http://www.iasj.net/iasj?func=fulltext&aId=60905>
- Schawn, W. (2014). Plaque, Definition of Plaque. Retrieved from <http://dentistry.about.com/od/termsanddefinitions/g/plaque.htm> About.com Dent Care.
- Schroth, R.J., Brothwell, D.J., & Moffatt, M.E. (2007). Caregiver knowledge and attitudes of preschool oral health and early childhood caries (ECC). *Int J Circumpolar Health*, 66, 153-167.
- Scheutz, F., Heidmann, J., & Poulsen, S. (1983). Dental health of Vietnamese Boat People on Pulau Bidong, Malaysia, 11(4), 255-258.
- Shamsi, M., Hidarnia, A., Niknami, S., Rafiee, M., Zareban, I., & Karimy, M. (2013). The Effect of Educational Program on Increasing Oral Health Behavior among Pregnant Women: Applying Health Belief Model. *Health Education & Health Promotion (HEHP)*, 1(2), 21- 36.
- Skeie, M. S., Riordan, P. J., Klock, K. S., & Espelid, I. (2006). Parental risk

- attitudes and caries-related behaviours among immigrant and western native children in Oslo. *Community dentistry and oral epidemiology*, 34(2), 103-113.
- Spitz, A.S., Weber-Gasparoni, K., Kanellis, M. J., & Qian, F.J. (2006). Child temperament and risk factors for early childhood caries. *Dent Child (Chic)*, 73(2), 98-104.
- Sugar Sweetened Beverage Guide*. The CDC Guide to Strategies for Reducing the Consumption of Sugar-Sweetened Beverages.2010. Retrieved from http://www.cdph.ca.gov/SiteCollectionDocuments/StratstoReduce_Sugar_Sweetened_Bevs.pdf (accessed January. 2015)
- Suresh , B ., Ravishankar , T . , Chaitra , T . , Mohapatra, A., & Gupta, V. (2010). Mother's knowledge about pre-school child's oral health. *Journal of Indian Society of Pedodontics and Preventive Dentistr*, 28(4), 282.
- Sutton, S. (2002). Health Behavior: Psychosocial Theories. University of Cambridge UK. Retrieved from <http://userpage.fuberlin.de/~schuez/folien/Sutton.pdf> (accessed February. 2015)
- Theilheimer, R. (2006). Zero to Three: “Primary Caregiving and Continuity of Care”. National Center for Infants, Toddlers and Families. Retrieved from <http://www.zerotothree.org/early-care-education/child-care/primary-caregiving-continuity.html> (accessed March. 2016)
- Timmins, C. L. (2002). The impact of language barriers on the health care of Latinos in the United States: a review of the literature and guidelines for practice. *Journal of Midwifery & Women's Health*, 47(2), 80-96.
- Tinanoff, N., & O'Sullivan, D. (1997). Early childhood caries: overview and recent findings. *Pediatric dentistry*, 19(1), 12-16.
- Togoo, R. A., Zakirulla, M., Yaseen, S. M., Nasim, V., & Al, A. R. (2012). Cross-Sectional Study of Awareness and Knowledge of Causative Factors for Early Childhood Caries among Saudi Parents: A Step towards Prevention. *International Journal of Health Sciences & Research*, 2(3).
- United States Census Bureau, (2012). Profile America Facts Of Feature . US Departement of Commerce. Washonton. Retrieved from http://www.census.gov/newsroom/releases/archives/facts_for_features_special_editions/cb12-ff08.html (accessed December. 2014)
- United States General Accounting Office*, ORAL HEALTH Factors Contributing to Low Use of Dental Services by Low Income Populations. Report to Congressional Requesters. 2000.
- US Department of Commerce*. Washonton, D.C. 20233. U.S. *Census Bureau News*. Profile Facts for Features. Mother's day May13, 2012. Retrieved from https://www.census.gov/newsroom/releases/pdf/cb12ff-08_mothersday.pdf (accessed December. 2014)

- Vann, W.F., Lee, J.Y., Baker, D., & Divaris, K. (2010). Oral health literacy among female caregivers: impact on the oral health outcome in early childhood. *J Dent Res*, *89*, 1395–1400.
- Vanagas, G., Milasauskiene, Z., Grabauskas, V., & Mickeviciene, A. (2009). Associations between parental skills and their attitudes toward importance to develop good oral hygiene skills in their children. *Medicina (Kaunas)*, *45*, 718-23.
- Waldman, H.B. (1998). More children are unable to get dental care than any other single health service. *ASDC J Dent Child*, *65*, 204-08.
- Wigen, T.I., Espelid, I., Skaare, A.B., & Wang, N.J. (2011). Family Characteristics and Caries Experience in Preschool Children. A Longitudinal Study from Pregnancy to 5 Years of Age. *Community Dent Oral Epidemiol*, *39* (4), 311-317.
- Wikipedia (2014). Arabs: Demographics. Retrived from http://en.wikipedia.org/wiki/Arab_people (accessed January. 2015)
- Williams, N., Whittle, J., & Gatrell, A. C. (2002). The relationship between socio-demographic characteristics and dental health knowledge and attitudes of parents with young children. *British dental journal*, *193*(11), 651-654.
- World Health Organization, Advocacy, *Communication And Social Mobilization For TB Control: A Guide To Developing Knowledge, Attitude, And Practice Surveys*. WHO Press: Switzerland. 2008.
- Wong, D., Spiess, S.P., & Julliard, K. (2005). Attitudes of Chinese parents toward the oral health of their children with caries: A qualitative study. *Pediatric Dentistry*, *27*, 505-512
- Yang Y .M., & Wang, H,H. (2003). Life and health concerns of Indonesian women in transnational marriages in Taiwan. *J Nurs Res*, *11*(3), 167-176
- Zohra, J., & Seema, C. (2014). Association of Child Temperament with Early Childhood Caries. *J Clin Diagn Res*, *8*(12), ZC21–ZC24.