

Research Article

Postpartum Maternal Health at a Time of Rapid Societal Change in Abu Dhabi, United Arab Emirates

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Abstract

Background. Abu Dhabi has undergone a rapid transition from a subsistence economy to a wealthy modern state over the last 50 years. This article presents an insight into the health status of Emirati mothers during this transition through a prospective longitudinal study of mothers who gave birth in a government maternity hospital in the Emirate of Abu Dhabi. **Methods.** 125 women were interviewed within the first week after birth, as part of a larger study encompassing a wide range of cultural, social, and behavioural aspects of health. They were then re-interviewed at three-, six- and fifteen-months postpartum. A food frequency questionnaire was also administered to the mothers at birth. Data were analysed using univariate statistics. **Results.** Over 70% of the mothers had BMI in the overweight and obese categories, and approximately half of the women were dissatisfied with their weight. Contributing factors were likely to be diets high in fats and sugar, low levels of exercise and women's limited involvement in household food purchasing and preparation. Iron deficiency anaemia, diabetes, asthma and fertility problems were found to be the most common concerns amongst the participants prior to conception. Anaemia rates were high during pregnancy, with 35% having haemoglobin < 11 g/dL, and were positively associated with parity. Belief in traditional and herbal medicines was strong, with 43% of women using a variety of remedies during pregnancy. **Conclusions.** Policies and support mechanisms to encourage women to make better dietary choices and to provide more opportunities for exercising are required to improve the health of mothers in the UAE. The development of good quality healthcare has resulted in the better maternal health outcomes, although traditional practices in relation to herbal medicines are still common.

Keywords: maternal health, anaemia, obesity, diet, Abu Dhabi

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Received: 15 July 2018

Accepted: 29 August 2018

Published: 31 August 2018

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Editor-in-Chief:
Dr. Dimitrios Papandreou

Official Publication of Zayed



جامعة زايد
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1. Introduction

Prior to the development of the oil industry in the 1960s, the population of the Tru-
cial States generally led a subsistence existence based on fishing and agriculture [1].
Following the formation of the United Arab Emirates (UAE) in 1971, there has been
rapid economic and social development. This article presents an insight into the health
status of Emirati mothers in Abu Dhabi, UAE during this transition.

Development and globalisation have taken their toll on the dietary habits of the
inhabitants of the countries in the Arabian Gulf. The traditional diet of the region
included fish, wheat, chickpeas, broad beans, lentils, sesame, fruits (especially dates)
and green vegetables. This diet, low in fat and cholesterol and high in fibre, has been
replaced with foods high in fat and sugar, and fast foods are readily available. Over a
40-year period (1958 to 1998), the average intake of energy per person has increased
by 30% driven largely by a large increase in fat consumption (45%) [2]. Research on
nutritional intake in the UAE is limited, but several studies have reported low fruit
and vegetable intake in this population [3–5]. The UAE Health and Lifestyle Survey
conducted in Al Ain in 2000 found that higher levels of fruit and vegetable intake were
both associated with increased physical activity, and were higher in those aged over
thirty years. Less than 20% of Emiratis consumed low fat or skimmed milk, and one in
six drank camel milk [5].

Heart disease, diabetes, particularly non-insulin-dependent diabetes, and obesity
are major health problems in the UAE [6]. In 1998, 30% of deaths in the UAE were due
to cardiovascular disease [7]. The prevalence of obesity was 16% in men and 38%
in women, while the prevalence of high blood pressure was 24% in men and 20% in
women, respectively [7]. The prevalence of being overweight in women over 15 in
the UAE was 66.2% in 2005 and rose to 71.1% in 2016 [8]. Current estimates of the
prevalence of diabetes amongst the UAE population rate it as the 11th highest in the
world with an adult incidence of 19.3% [9].

WHO report fluctuating prevalence of anaemia amongst pregnant women in the UAE
with rates at 36.8% in 1990, decreasing to 30.0% in 2002 and rising again to 33.2% in
2016 [10]. Several aspects of the UAE diet may inhibit iron absorption such as the high
consumption of tea, which contains tannins and large quantities of unleavened bread
containing phytates [11]. Further, it is common for women in the UAE to be in a constant
cycle of pregnancy and lactation, which also depletes maternal iron stores, increasing
the risk of iron deficiency anaemia [12].

The aims of this study were to examine the prevalence of health issues and factors, which impacted on the health of Emirati women during the 15-months postpartum. The original study from 2002 is set in the context of more recent developments.

2. Methods

Data were collected in relation to maternal health and nutrition from birth to 15-months postpartum, as part of a study encompassing a wide range of cultural, social, and behavioural aspects of health in a cohort of women and infants.

One hundred and twenty-five Emirati women, together with their husbands or guardians, provided written, informed consent to participate in the study, which was approved by the Human Research Ethics Committee at Zayed University, Abu Dhabi, UAE.

Questionnaires were designed following input from international consultants and Emirati female researchers, who ensured cross-cultural equivalence of the instruments [13]. All materials were created in English and then translated into Arabic using a cross-translation technique [14]. Under this technique, an Emirati female research assistant translated the English document into Arabic, and then a different Emirati assistant (blind to the original document) retranslated the document back into English. Any differences identified were reviewed with Emirati and Western researchers and modified to minimise semantic differences. Questionnaires for the maternal health component of the study were designed to gather information on a range of health, lifestyle and nutrition practices in this population.

A pilot study was conducted in which 10 Emirati women who had given birth in the Corniche Hospital (government maternity hospital in Abu Dhabi) were recruited. As a result, further adaptations to the study were made in order to account for maternal literacy and the number of visitors in the mother's hospital room.

All Emirati women who gave birth in the Corniche Hospital over the period of one month were invited to be part of the study. Around 10% of the eligible participants declined to take part in the study, primarily due to ill health or because they were refused permission from their male guardian. An Arabic-speaking female research assistant interviewed mothers during their postpartum stay in the hospital. Additionally, their medical records were reviewed, and then they were contacted via mail and/or telephone at three ($n = 94$), six-months ($n = 59$) and fifteen-months ($n = 52$) postpartum. A food frequency questionnaire was also administered to the women at

TABLE 1: Characteristics of mothers and infants.

Participant Characteristics			
Maternal			
Age in years (mean, SD, range)	28.7	5.7	16–46
Age at marriage in years (mean, SD, range)	20.8	4.5	11–38
Parity (mean, SD, range)	3.4	2.1	1–9
Primiparous (<i>n</i> , %)	29	23%	
Education level (<i>n</i>, %)			
None	6	5%	
Primary	28	22%	
Secondary	62	50%	
Diploma/degree	29	23%	
Working before birth (<i>n</i> , %)	36	29%	
Consanguineous marriage (<i>n</i> , %)	60	48%	
Polygamous marriage (<i>n</i> , %)	7	6%	
Household			
Size of household (mean, SD, range)	7.9	4.4	3–24
Domestic helpers (mean, SD, range)	1.6	1.4	0–10
Infant			
Male (<i>n</i> , %)	62	49.6%	
Female (<i>n</i> , %)	63	50.4%	
Gestation in weeks (mean, SD, range)	39.1	2.4	25–44
Birthweight in kg (mean, SD, range)	3.2	0.6	0.7–4.4

birth ($n = 125$) to assess their frequency of eating some common foods, and they were also asked about their participation in food purchasing and preparation.

Data were analysed using IBM SPSS Statistics package Version 23 [15]. Fisher's exact test and Pearson's chi-squared tests were used to assess relationships as appropriate.

3. Results

Participant characteristics are shown in Table 1 and encompass a wide distribution of age, education levels and parities.

TABLE 2: Frequency of health concerns prior to conception.

Condition Entering Pregnancy	Frequency	Percentage
Anaemia	20	16.0
Infertility	10	8.0
Diabetes	9	7.2
Asthma	9	7.2
Breast Surgery	3	2.4
Allergy	2	1.6
Gynaecological Problems	2	1.6
Arthritis	1	0.8
Irritable Bowel Syndrome	1	0.8
Smoking	1	0.8

Iron deficiency anaemia, diabetes, asthma and fertility problems were found to be the most common concerns amongst the participants prior to conception (Table 2).

During pregnancy, the women reported a slight increase in the rate of diabetes to 8% ($n = 10$), and 4% ($n = 5$) had hypertension. Twenty (16%) mothers reported being anaemic. However, using the WHO-recommended threshold of haemoglobin < 11 g/dL, 35% ($n = 44$) of the participants were anaemic during pregnancy. Anaemia during pregnancy was positively related to parity ($\chi^2_{1df} = 7.75, p = 0.005$).

The women were asked to describe their health and satisfaction with their weight at three-, six- and fifteen-months postpartum (Table 3). A common postpartum problem was the failure to return to pre-pregnancy weight. Approximately half the women were dissatisfied with their weight at all time points. The mean BMI of the 125 participants at three months postpartum was 27.7 with a range from 19 to 40.5. The majority of the women were overweight or obese (45%, and 26%, respectively) with the remaining 29% being in the normal weight range. BMI was positively related to the age of the participants ($\chi^2_{1df} = 5.2 p = 0.02$).

When asked at 3-months postpartum if they had suffered any health problems since the birth, 25 of the 92 respondents (27%) gave a positive response. These health problems included: back pain ($n = 8$), abdominal pain ($n = 4$), pain from caesarean section ($n = 4$), haemorrhoids ($n = 2$), anaemia ($n = 2$), respiratory problems ($n = 2$), abnormal vaginal bleeding ($n = 1$), breast pain ($n = 1$), and headaches ($n = 1$).

At six-months postpartum, 86% of participants reported excellent or good health. By 14–15-months postpartum, 28 (54%) reported problems with their health, fifteen

TABLE 3: Self-reported assessment of health and satisfaction with weight at 3-, 6- and 15-months postpartum.

	3 months		6 months		15 months	
Self-reported Health	N (94)	%	N (59)	%	N (51)	%
Excellent	31	33	18	30.5	23	45.1
Good	44	46.8	33	55.9	24	47.1
Fair	14	14.9	5	8.5	3	5.9
Poor	5	5.3	3	5.1	1	2
Self-reported Satisfaction with Weight	N (90)	%	N (59)	%	N (51)	%
Very satisfied	19	21.1	11	18.6	11	21.6
Reasonably satisfied	24	26.7	17	28.8	16	31.4
Unhappy	47	52.2	31	52.5	24	47.1

(29%) claimed to be overweight and three (6%) underweight, although none of the women were below normal BMI calculated from the figures provided. Twenty-four (47%) of the women were unhappy with their weight. However, only 12 (23%) of the participants were dieting and 24 (48%) reported exercising, most commonly by walking. Only 39 of the women supplied their current weight and height, and this was used to calculate the BMI. The results showed that 12 (31%) participants were in the normal range, 17 (44%) were overweight, and 10 (25%) were obese. Several other health problems were common; with 10 (19%) participants being anaemic; 1 (2%) diabetic, 4 (8%) suffering from depression, and 3 (6%) were hypertensive.

At 14 to 15 months after the birth of the infants, 11 (22%) of the 52 respondents in the study were pregnant again, with five in the 1st, one in the 2nd, and four in the 3rd trimesters, with one having already given birth). A further five women were unsure whether they were pregnant or not.

The results from the food questionnaire are summarised in Table 4.

Seventy nine percent of the participants reported consuming boiled rice six or more times each week, often accompanied with yogurt. Fish (usually grouper, locally known as hammour) was consumed by 45% of participants three or more times each week. Only one in five women reported consumption of more than four pieces of fruit and vegetables daily; 12% had a relatively poor intake of fruit, consuming less than one piece daily; and 14% consumed less than one vegetable per day. Vegetable oil is commonly used and is liberally added to boiled rice and other traditional dishes such

TABLE 4: Frequency of weekly consumption of common foods.

Food	Weekly Consumption								Total
	≥ 6		3 to 5		1 to 2		Rarely		
	n	%	n	%	n	%	n	%	
Meat	10	8	24	19.2	45	36	46	36.8	125
Fish	11	8.9	45	36.6	54	43.9	13	10.6	123
Pasta	1	0.8	19	15.3	61	49.2	43	34.7	124
Rice	99	79.2	12	9.6	13	10.4	1	0.8	125
Potatoes	12	9.6	34	27.2	50	40	29	23.2	125
Fried food	9	7.2	41	32.8	53	42.4	22	17.6	125
Biscuits	11	8.8	24	19.2	42	41.6	38	30.4	125
Sweets	26	20.8	24	19.2	36	28.8	39	31.2	125

as biryani and harees. Full cream milk was generally consumed by the women (71%), whilst only 1% used skimmed milk. No significant relationship was found between nutritional intake and education level.

Sixty percent ($n = 70$) of the participants reported that a male family member bought food for the household and only 29% ($n = 36$) of the participants shopped for food. In addition, only 66% ($n = 83$) of the women determined what was to be eaten at meal times. Eighteen percent ($n = 23$) said their mother or mother-in-law decided, while 10% ($n = 13$) said their husband decided. In this sample, only 46% ($n = 57$) of the women reported that they prepared food for themselves and their families, while household staff prepared the food in 42% ($n = 53$) of the households.

4. Supplements and Traditional Medicine

During pregnancy, 100 participants (80%) took iron supplements, 77 (62%) took folic acid, and 56 (45%) took multivitamins. Participants with higher levels of education were more likely to take folic acid, iron supplements, minerals and multivitamins during pregnancy (Table 2). Seventeen participants (14%) reported consuming pills given to them by health professionals that they were unable to identify and unable to say why they were prescribed. Forty three percent ($n = 54$) of the women used traditional herbs and medicines during pregnancy (Table 5).

TABLE 5: Frequency and perceived purpose of traditional remedies used during pregnancy.

Type of Remedy	n	(%)	Reported Reasons for Using
Thyme	23	18.4	Gas/ease delivery/postpartum
Al Holul (<i>Senna</i>)	20	16.0	Stomach cleansing/constipation/ease delivery
Cinnamon	8	6.4	Ease delivery (often only used at the end of pregnancy)
Fenugreek	5	4.0	Initiate and ease labour
Honey/black honey	4	3.2	Strength during delivery/initiate labour
Sage	4	3.2	Ease delivery/postpartum/gas
Al musawafa	4	3.2	Gas/lowering blood sugar/widening the uterus/foetal growth
Oil	4	3.2	Allergy/during hot weather/preventing nipple cracking
Chamomile	3	2.4	Stomach/gas/headaches
Castor oil	3	2.4	Stomach cleansing
Yaada (<i>Teucrium stocksianum</i>)	3	2.4	Heartburn
Aniseed	3	2.4	Not reported
Mint	3	2.4	Not reported
Black seed (<i>Nigella sativa</i>)	2	1.6	Preparation for delivery
Al zohorat (<i>Tribulus</i> sp.)	2	1.6	Not reported
Dates and raisins	2	1.6	Strengthen blood/prepare for labour
Sheeh (White wormwood <i>Artemisia herba-alba</i>)	1	0.8	Stomach cleansing
Rose	1	0.8	General well-being and ease labour
Hibiscus	1	0.8	Not reported

5. Discussion

This study found that 71% of the Emirati women participating were overweight at three-months postpartum. Obesity is recognised as a serious health problem in the UAE, and other studies have also reported a high prevalence of obesity in the female population [5, 6, 16–18]. Previous research into obesity levels in the UAE has focussed on dietary intake [3–5, 19]. A recent study suggested that the environment in the UAE was conducive to women becoming overweight or obese due to an excessive intake of

foods with high sugar content and snacking [17]. In addition to nutritional factors, physical activity levels are low amongst Emirati women, exacerbating these health issues [17, 20]. Little research has been carried out in the UAE on physical-activity levels, and attitudes towards Emirati women participating in sports. A third of the participants in the current study reported exercising regularly, but more research is needed to determine the duration and intensity of exercise in this population. Factors associated with obesity in the Arab population include age, age at marriage, education level, socio-economic status and employment status. The prevalence of obesity increased with age, and was lower in women with higher levels of educational attainment and those in employment [21–24]. In Bahrain, Saudi Arabia, Qatar and Iran, it has been reported that women in employment were less likely to be obese or overweight, due to increased exposure to social and health education information, and increased levels of mobility [22, 23, 25, 26]. Women often attribute problems with weight gain to pregnancy, and there is some evidence to support this [27, 28].

Anaemia has been identified as a serious health problem for pregnant women in the Eastern Mediterranean region, particularly in Arab countries [18, 29]. Data on the incidence of anaemia collected from the participants medical records in this current study show a higher prevalence of anaemia during pregnancy in comparison with two previous studies conducted in the UAE [11, 12]. Although this could be reflective of the smaller sample size, participants with larger families were more likely to suffer from anaemia, a finding also reported in an Omani population with similar characteristics [30]. In addition, participants with lower education levels were less likely to have taken folic acid and iron supplements during pregnancy. It is interesting to note that the self-reported incidence of anaemia during pregnancy was significantly different, which suggests that the women were unaware that they were anaemic or were reluctant to report it.

The Emirati women who participated in this study reported a diet based on rice, with a relatively high intake of fats, sweets and fried foods. Interestingly, the women reported having limited involvement in food purchasing and preparation. Only 29% of the participants were responsible for food shopping, 46% were involved in food preparation for the household, and 66% determined what was eaten at mealtimes. Nutritional intake and practices relating to food consumption have a significant impact on the health of Emirati women, [17, 18] and which, along with low levels of physical activity, have important public health implications. If addressed, these factors could result in dramatic improvements in the health of the UAE population, especially for Emirati women.

There is a long history of the use of traditional herbal medicines in the UAE and traditional healers remain an integral component of the health system. Participants consumed a wide range of traditional remedies during pregnancy, birth and the neonatal period and belief in these remedies remains strong among this population [31]. In the Arab world, it is estimated that over 260 varieties of medicinal plants are in use [32]. Some traditional remedies have been associated with adverse effects such as gastrointestinal disruption and allergies, and there have been reports of thyme being associated with reduced breast milk production. Often multiple medicinal plants are taken at once, which may lead to negative interactions with other medications [31, 33].

6. Conclusion

Obesity, anaemia and diabetes were among the most common health problems reported in this cohort of Emirati women. These issues are associated with societal changes brought about during the rapid development of Abu Dhabi, with foods high in fat and low in nutritional value becoming readily available, and limited physical exercise. However, traditional practices remain strong, particularly in relation to the use of traditional and herbal remedies. The challenge for health professionals is to develop policies and support mechanisms to encourage women to make better dietary choices, take more involvement in food preparation and to provide more opportunities for exercising in order to improve maternal health in the UAE.

Conflict of Interests

The authors declare no conflict of interests.

Ethical Clearance

This study was approved by the Human Research Ethics Committee at Zayed University, Abu Dhabi, UAE.

Acknowledgements

The authors gratefully acknowledge the contributions of the Emirati mothers who took part in the study. Thuraya Al Shamsi facilitated access to the mothers at the Corniche

hospital through her role as the director of research for HH Sheikha Fatima's office and Nahied El-Temtamy provided translation and data input services.

Funding

The funding for this research was received from Zayed University Research Incentive Fund.

Author Contributions

HG – research design, data collection and analysis, drafted manuscript. KG – research design, data collection, contributed to and approved final manuscript. AG – data analysis, contributed to and approved final manuscript. DG – contributed to and approved final manuscript.

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