Cultural and ethnic barriers in conducting research

Factors influencing menarche in the United Arab Emirates

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ABSTRACT

Objective: The objective of this cross sectional survey was to study the feasibility of conducting research on issues related to physical and sexual maturation in a predominantly Islamic society and to identify the factors influencing menarche in this multi ethnic community.

Methods: This study was conducted in Al-Ain, United Arab Emirates (UAE) between January 1999 through to February 1999. Fifteen female secondary schools located in different geographical regions in Al-Ain were chosen in consultation with the District Education Department. All girls aged 12-16-years were selected. Information regarding whether they had attained menarche including month and the year, age at menarche and the factors influencing it such as height and weight, diet, physical activity were gathered. Univariate and multiple linear regressions were used in analysis.

Results: Of the 1500 questionnaires distributed, 1416 questionnaires were returned but only 890 had the required information and were used in the analysis. Ninety-three (10.4%) had not attained menarche and as expected these girls were younger ($p<0.0001$) than those who had attained menarche. Mean age at menarche was 12.68 (SD 1.27) years. In the univariate analysis UAE nationality, vegetarians ($p=0.001$), higher income group ($p=0.008$), low body weight ($p=0.009$) and a diagnosis of anemia ($p<0.05$) in the year before menarche were all positively associated with the age at menarche. Only anemia achieved borderline significance ($p=0.056$) in multivariate analysis and no other variables were significant.

Conclusion: This study highlights the difficulties of conducting research on issues considered to be sensitive by the community and provide data on factors influencing menarche in a multi ethnic community.

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Culture, social background, religion and linguistic factors can play a key role in subjects' willingness to participate in clinical and community research. It has been pointed out that attitude, beliefs, perceptions, and knowledge regarding clinical research and cultural characteristics of underrepresented minorities pose barriers to participation to clinical research in the United States

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of America (USA) population.[1] Also cultural factors including privacy and modesty appear to be important in the use of health care by Chinese women.[2] Literature on the impact of culture on research participation appears to be very limited. A study among veterans in the USA did not observe consistent racial differences in research participation. However the proportion of ethnic minority veterans were much higher among people who had a negative attitude to research.[3] Menarche is the milestone in a girl's development that signals the beginning of menstruation. It is a normal stage of puberty and indicates the potential to reproduce. Age at menarche varies across populations and at times even within population sub groups.[4] Data from the United Kingdom shows that mean age at menarche decreased for girls born in later half of the century as compared to girls born in earlier years.[5] Studies on menarche from the region are limited. According to a recent study from Iran the age at menarche for secondary school girls was 12.9-years.[6] Early age at menarche is associated with increased risk of breast cancer due to prolonged exposure to endogenous estrogen and progesterone.[7] Age at menarche and the factors influencing this are of interest to professionals and policy makers alike, as it has been suggested that changes in age at menarche can serve as a form of primary prevention of breast cancer.[8] Although studying the factors influencing menarche is important as it is considered as a sensitive issue it might have its own problem in specific cultures. United Arab Emirates (UAE) is predominantly Islamic and in the only federal medical school there is gender segregation while teaching. Here we present our experience of a study on the factors influencing menarche in a multiethnic community and the impact of cultural issues on a subject considered sensitive in certain communities.

Methods. A cross sectional community based survey using a self-administered questionnaire was conducted in Al-Ain city, UAE between January and February 1999. One thousand and fifteen hundred secondary school girls from different nationalities studying in governmental and private schools participated in this study. Fifteen schools from different geographical regions in Al-Ain, chosen in consultation with the District Education Department, were included as they represent all schools and fulfilled the criteria of the study design. The inclusion criteria were girls in the selected schools studying in year 7-10. This was chosen, as we wanted to include girls aged between 12 and 16-years of age. The Faculty of Medicine and Health Sciences research ethics committee and the District Education Department approved the study. The girls who took part were briefed on completing the questionnaires. Participation was entirely voluntary and all the subjects provided informed oral consent. One of the authors (NO) visited all the 15 schools and explained the details to the students. All the participants verbally agreed to participate and filled in the questionnaire. Questionnaires were in Arabic and English, as many expatriate children do not study Arabic. The questionnaire was devised after reviewing the literature.

The data collection took place over a period of 3 weeks and the demographic features were recorded for the girls. Information gathered included the date of birth, nationality, height, weight, month and year of menarche (if menstruating), usual diet and exercise patterns. The girls were also asked when they had their first period. Dietary section of the questionnaire was designed to allow approximation of fat intake per week based on consumption of a series of major fat containing foods that are typically eaten in this part of the world. The fat values for the foods were derived from "Food values of portions commonly used"[9] and thus a weekly fat intake was arrived at. Dietary history was gathered for the year before attaining menarche or for the last year if they had still not attained menarche. Data on physical activity pattern was also gathered. This mainly consisted of sporting activities the participants performed and the duration of each over a week. Using this information the energy expenditure was calculated using "Mayo Clinic Family Health Book".[10] The energy expenditure per week was calculated for each subject by totalling the values of different activities.

Data was entered into SPSS 8.0 for windows, which was used for analysis. The outcome of interest was having attained the menarche and the actual age at menarche. Independent sample t-tests were performed to test the differences between continuous variables and Chi-square and Fishers exact tests as appropriate were carried out for categorical variables. Univariate linear regression was carried out with age at menarche as the dependent variable and multiple linear regressions was performed to adjust for potential confounders.

Results. One thousand and five hundred questionnaires were distributed amongst 15 schools. One thousand, four hundred and sixteen questionnaires were returned of which 526 could not be used as the question regarding menarche was left blank. Eight hundred and ninety questionnaires were analyzed of the 1500 distributed and the final response rate in the study was just under 60%. Two hundred and forty (27%) were UAE nationals, 248 (27.9%) were other Arabs, 316 (35.5%) were Asians and the remaining 86 (9.7%) belonged to other nationalities. The mean age of the population was 15.55 (SD 1.68) years. Nearly 3 quarters of the

girls' parents had a monthly income of less than 10,000 Dhs (1US$=3.68Dhs). Of the 890 girls who were included in the study 93 (10.45%) had not attained menarche. As expected the mean age of girls who had attained menarche was significantly (p<0.0001) higher as compared to girls who have not attained menarche; 15.77 versus 13.99. The mean age at menarche was 12.68 (SD 1.27) years. The age at menarche and (standard deviations) by nationality was UAE nationals 12.91 (1.39), Other Arabs 12.72 (1.23), Asians 12.41 (1.20) and other nationalities 12.89 (1.14) years. Anemia was significantly more prevalent in the girls, who had attained menarche as compared to pre menarche group (12.4% versus 2.4%, Fisher's exact test p=0.003) (**Table 1**). **Table 1** shows the results of the univariate analysis of the factors influencing menarche in the internal comparison in those who had attained menarche. **Table 2** shows the age at menarche by height, weight and body mass index (BMI), which shows an inverse relation between menarche age and BMI. A multiple linear regression analysis was then performed entering all variables that were found significant in the univariate analysis. The variables entered in to the model were UAE national (yes/no), vitamin use, BMI, vegetarianism and presence of anemia. None of the variables were statistically significant in the multivariate analysis although presence of anemia delayed menarche (p=0.056).

Discussion. Menarche is the milestone in a girl's development that signals the beginning of menstruation. It is a normal stage of puberty and indicates the potential to reproduce. Age at menarche varies across populations and at times even within population sub groups.[4] Our study was designed to find the menarche time in different nationalities as well as the influence of other factors. In our study only 60% of the participants provided the required information, which limits the generalizability of the findings. However the results do show the problems of conducting community based research on sensitive issues. Race has been documented as one of the factors influencing response rate in surveys of multicultural women.[11] The association between sensitivity of the topic and non-participation also appears to be culture specific. British researchers[12] found that in the national sex survey, sensitivity of the topic had a large effect on item non-response only for a small group of participants. The main reasons for the 40% non response rate in our study is due to the fact that in this traditional Islamic society still it is considered as a taboo to discuss openly issues such as menarche. Even in the UAE medical school, there is gender segregation and male and female students are taught separately. While completing the

Table 1 - Factors influencing menarche - results of univariate analysis.

Variable	N#	Mean age of menarche	*p* value
Ethnic group			
UAE nationals	218	12.91	
Other Arabs	225	12.72	0.132
Asian subcontinent	277	12.41	0.000
Others	77	12.89	0.905
Monthly income			
Up to 10,000 Dhs/m	505	12.59	0.008
Over 10,000 Dhs/m	191	12.89	
Vegetarianism			
Yes	78	13.10	0.001
No	398	12.58	
Iron tablet use			
Yes	54	13.01	0.027
No	412	12.61	
Fat intake (gm/week)			
Q1*	136	12.47	0.118
Q5*	135	12.72	
Physical activity (energy expenditure/week)			
Low**	122	12.64	0.974
High**	122	12.64	
Weight (kg)			
Light	302	12.81	0.009
Heavy	324	12.54	
Diagnosed anemia			
Yes	90	12.96	0.027
No	637	12.64	

subjects with valid issues, * Q1 lowest quintile, Q5 highest quintile
**<= median energy expenditure/week, UAE - United Arab Emirates
DHS - dirhams

Table 2 - Age at menarche by mean height, weight and body mass index (BMI).

Age at menarche (quintiles)	Height (cm)	Weight (kg)	Body mass index
11.67	156.97	53.88	23.09
12.37	157.87	55.31	22.65
13.02	159.83	53.46	21.45
13.75	159.67	52.25	21.75
17.32	156.75	50.94	20.97
Total number*	**476**	**626**	**423**

*subjects with valid values

questionnaires many participants had left the menarche section of the questionnaire blank and hence these questionnaires could not be analyzed. The non-response was higher in government and Arabic schools as compared to the private and English schools. Despite the 40% non-response rate observed in this study, we feel that the results might be of interest as there is scarce data on menarche from the Arabian Peninsula. In this study no association between social class and age at menarche was observed in multivariate analysis although a study from Nigeria reported that higher social class is related to earlier menarche.[13] In this oil rich state absolute poverty is almost non-existent and it is possible that social class may not have the same role on the age at menarche in this society. Petridou et al[14] has pointed out that the association between age at menarche and social class has gradually disappeared following nutritional assimilation across socio-economic groups and our findings are in agreement with this explanation. To measure fat intake and calorie expenditure, we use locally devised instruments. This consists of collecting information on a series of major fat containing foods that are typically eaten in this part of the world. Although, the measurements may not be accurate, we used the same measure to gather information from all participants such as those who had attained and not attain menarche. We observed age at menarche to be higher in non-meat eaters. Meat eating could be a surrogate for fat intake. It has been observed that intake of fat accelerates menarche.[15] Many studies have observed a negative association with BMI and age at menarche.[14,15] Our study confirms this finding (**Table 2**). Although, participation in sports activities is associated with delayed menarche,[15] no association was found in the present study. It is possible that the instruments we used to measure energy expenditure through sports activities had measurement errors and we could not detect an association even if one existed. Anemia and use of iron tablets in the year before menarche, was associated with delayed menarche. There could be 2 possible explanations for this observation. Vegetarians tend to be more anemic due to their dietary practices[16] and the delay in menarche could be due to its association with vegetarian diet. On the other hand it is well known that in patients with severe forms of anemia, sexual developments are delayed including menarche.[17] Apart from the non-response rate, few other limitations merit attention. We used locally developed instruments to measure fat and physical activity, which were not validated. In the study participants had to recall the relevant information in the year prior to attaining menarche, which may not be accurate. But, as the participants were not aware of the factors that influence menarche that were being studied, recall bias if any would not likely to have affected the results. The participants were briefed on the nature of the study, aim and what is expected of them. They were told that the study would collect information on a list of related factors that could potentially influence menarche.

In conclusion, our study is a bold attempt to study a sensitive issue in a traditional Islamic society, which resulted in a lower response rate, with missing data for many subjects. However this study has confirmed many previously reported factors influencing menarche such as BMI, vegetarian diet and the presence of anemia in the year before attaining menarche. Our study highlights the difficulties of conducting research on issues considered to be sensitive by the community and this needs to be considered by researchers in the future.

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