

Fertility Awareness among Medical and Non- medical Undergraduate University Students in Al-Iraqia University, Baghdad, Iraq

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Abstract Introduction: postponing child-bearing and its effect in declining fertility has been recognized recently as an important health, social and demographic concern in the world. **Aim of the study:** to determine the fertility awareness among undergraduate medical and non-medical students by their intention for parenthood, desired number, preferred age to have first and last child, to identify the major factors and their choices in case of infertility. **Methodology:** A descriptive cross-sectional survey study was conducted among medical and non-medical students at Al-Iraqia University, 150 students were the randomly selected sample size and data was collected using self-administrated questionnaire. Data entry and analysis was done using SPSS version 15.0. **Results:** The study found that parenthood was higher among non-medical students than medical students. Medical students desired to have only one child in comparison to non-medical students desire to have 4 or more children. The preferred age to have first child was 25-29 years among medical students in contrast to 21-24 years for non-medical students. Majority of medical students preferred the age of 30-39 years for the last child compared to 40-44 years for non-medical students. Smoking and alcohol were the major factors affect fertility reported by medical students compared to caffeine and diet as major factors by non-medical students. IVF with high expected success rate was the choice in case of infertility among medical students more than non-medical one. **Conclusion:** The students of this study plan to have children within a women's window of fertility, however, their overestimate about the female fertility period could lead to delayed child bearing, so, it is mandatory to increase the level of awareness about this important period of life.

Keywords: *childbearing, infertility, awareness*

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1. Introduction

University years are a time for self-maturation and transition to adulthood including exploration of identity and sexuality. [1]

Postponing the commencement of child bearing has become common in western countries, resulting in an increasing number of pregnancies in women over 35years old and contributing to the decline in the total fertility rate, [2] as female fertility decline with advancing age and the reproductive phase in women is relatively short in comparison to their entire life span. Whereas male reproductive function is maintained with only slight decline until old age. [3] Some studies found that the educational level has an effect, as women with higher education, tend to postpone commencement of child bearing. [4]

The postponement of child bearing reflects contemporary social norms of delaying marriage, pursuing educational goals and securing economic stability prior to attempting conception. [5] However, it is unclear to what extent women and men are aware of age related fertility

decline, [6] and this delay in child bearing is associated with decrease fertility. Furthermore, the advanced maternal age at first birth is also associated with increase rate of obstetrics complications including preterm delivery, multiple birth, low birth weight and stillbirth. [5]

A lack of fertility awareness in young people and among women seeking fertility treatment may decrease the duration of fertility. [7]

This unexpected event can lead to significant alteration in a couple's family and social network, strain on the marital relationship, in addition to the emotional as well as physical challenges associated with fertility treatment. [8]

Assisted reproductive techniques seemed to be effective nowadays, as the average live birth rate per cycle of IVF in the USA is 30%, with success rate of 18% for women at the age of 40, and only 3% for women at the age of 44. [9] Accordingly, men and women may become victims of overestimate of these techniques likelihood that will solve the fertility problem that may experience. [10]

Several studies have addressed the fertility awareness among university students in most developed countries. However, no studies were founded to concern about this topic in Middle East. So, this study could be the first study

that deals with this topic in that area, particularly among undergraduate medical and non-medical students at Al-Iraqia University (College of Medicine and College of Business and Economic). The study aimed to determine student's intention for parenthood, their desired numbers and their preferred age to have first and last child, their perception about effect of lifestyle factors on fertility and to clarify their presumed behavior in case of infertility and their expected chance of IVF success to get a child.

2. Methodology

A descriptive cross-sectional survey study design was conducted from May to July 2015. Where 150 students of two Colleges of Al-Iraqia University (Medical and non-medical) were randomly selected.

A semi structured self-administrated questionnaire was developed for data collection. The questionnaire was developed based on published researches. [1,2,5,7,11,12] Furthermore, the content validity of questionnaire was maintained and the reliability was calculated (0.78) using internal consistency (Cronbach's alpha) test.

The collected data was entered into the computer software program of Statistical Package for the Social Sciences (SPSS) version 15.0, and then analyzed using descriptive summaries such as frequencies and percentages. Chi-square test (χ^2) with a 95% confidence interval was used to obtain the significant differences regarding students' intention, desire, preferred age for first and last child, behavior in case of infertility and expected chance of IVF success to get a child. A p-value of < 0.05 was considered to indicate the level of significance throughout the study.

Ethical approval was obtained from Al-Iraqia Medical College, Department of Community Medicine. Furthermore,

other ethical requirements including consent with students' right to refuse in participation and the confidentiality were ensured.

3. Results

A total of 150 students participated in this study; fifty percent of them were distributed among each medical and non-medical college. The female to male ratio of participants was approximately equal (1.08:1). The mean age was 20.7 ± 1.5 years. The majority of participants were single (90.6%), 5.3% were engaged and only 4% were married. None of the participants had a child. (Table 1)

Table 1. Participants Socio-demographic characteristics

Variables	Description	No (%)
Age	Mean \pm SD	20.7 \pm 1.5
	Median	21.00
	Range (min-max)	10 (19-29)
Gender	Female	78 (5.2)
	Male	72 (48)
	Single	146 (90.6)
Marital status	Engaged	8 (5.3)
	Married	6 (4)
Parenthood status	Have children(yes)	-

Regarding students intention to commence childbearing, the majority of non-medical students reported that it is important more than medical students (97% of males and 92% of females vs. 80% of males and 72.5% of females respectively) (χ^2 : 5.449, df: 1, P = 0.020 and χ^2 : 5.086, df: 1, P = 0.024 respectively). (Table 2)

Table 2. Intention to commence childbearing among university students regarding to their gender.

Intention for childbearing	University students								Total			
	Medical ^a				Non-Medical ^b				Female		Male	
	Female		Male		Female		Male		Female		Male	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Important	29	72.5	28	80	35	92.1	36	97.3	64	82.1	64	88.9
Non-important	11	27.5	7	20	3	7.9	1	2.7	14	17.9	8	11.1
Total	40	100	35	100	38	100	37	100	78	100	72	100

a: χ^2 : 5.086, df: 1, P = 0.024; b: χ^2 : 5.449, df: 1, P = 0.020.

Medical students desired to have only one child compared to non- medical one (45% vs. 5.3% of females and 34.3% vs. 2.7% of males respectively) (χ^2 : 27.074,

df: 4, P <0.001 and χ^2 : 29.911, df: 4, P <0.001 respectively). (Table 3)

Table 3. Preference for number of children among university students regarding to their gender.

Number of Children	University students								Total			
	Medical ^a				Non-Medical ^b				Female		Male	
	Female		Male		Female		Male		Female		Male	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	18	45	12	34.3	2	5.3	1	2.7	20	25.6	13	18.1
2	10	25	12	34.3	5	13.2	3	8.1	15	19.2	15	20.8
2-3	7	17.5	5	14.3	8	21.1	7	18.9	15	19.2	12	16.7
3	4	10	5	14.3	11	28.9	10	27	15	19.2	15	20.8
4 or more	1	2.5	1	2.9	12	31.6	16	43.2	13	16.7	17	23.6
Total	40	100	35	100	38	100	37	100	78	100	72	100

a: χ^2 : 27.074, df: 4, P = 0.000; b: χ^2 : 29.911, df: 4, P = 0.000.

Medical students preference to have their first child at ages 25-29 compared to 21-24 years as preferred age for first child among non-medical students (68.6% of males

and 55% of females vs. 67.6% of males and 52.6% of females respectively) (χ^2 : 28.215, df: 3, $P < 0.001$ and χ^2 : 34.512, df: 3, $P < 0.001$ respectively). (Table 4).

Table 4. Preferred ages to have first child among university students regarding to their gender.

Preferred ages for first child	University students								Total			
	Medical ^a				Non-Medical ^b				Female		Male	
	Female		Male		Female		Male		No.	%	No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
21-24	1	2.5	2	5.7	20	52.6	25	67.6	21	26.9	27	37.5
25-29	22	55	24	68.6	8	21.1	5	13.5	30	38.5	29	40.3
30-34	15	37.5	6	17.1	6	15.8	2	5.4	21	26.9	8	11.1
35-39	2	5	3	8.6	4	10.5	5	13.5	6	7.7	8	11.1
Total	40	100	35	100	38	100	37	100	78	100	72	100

a: χ^2 : 28.215, df: 3, $P = 0.000$; b: χ^2 : 34.512, df: 3, $P = 0.000$.

More than fifty percents of medical females preferred 30-34 years as a preferred age to have a last child compared to 40-44 years among non-medical females (68.4%). Most of medical males preferred age 35-39

(68.6%) compared to 40-44 years of non-medical one (56.8%) (χ^2 : 59.470, df: 4, $P < 0.001$ and χ^2 : 16.719, df: 3, $P = 0.001$). (Table 5).

Table 5. Preferred age to have last child among university students regarding to their gender.

Preferred ages for last child	University students								Total			
	Medical ^a				Non-Medical ^b				Female		Male	
	Female		Male		Female		Male		No.	%	No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
25-29	15	37.5	-	-	1	2.6	-	-	16	20.5	-	-
30-34	23	57.5	4	11.4	2	5.3	1	2.7	25	32.1	5	6.9
35-39	1	2.5	24	68.6	8	21.1	11	29.7	9	11.5	35	48.6
40-44	1	2.5	6	17.1	26	68.4	21	56.8	27	34.6	27	37.5
45-50	-	-	1	2.9	1	2.6	4	10.8	1	1.3	5	6.9
Total	40	100	35	100	38	100	37	100	78	100	72	100

a: χ^2 : 59.470, df: 4, $P = 0.000$; b: χ^2 : 16.719, df: 3, $P = 0.001$.

The majority of medical females reported smoking (80%) as a major factor that have an effect on fertility followed by under-weight and caffeine (75% each), while non-medical females reported caffeine and diet (47.7% each) followed by alcohol and smoking (44.7% each) as a

major factors. 88.6% of medical males reported alcohol followed by caffeine and excessive weight (80% each) as a majors factors compared to diet (48.6%) followed by smoking and excessive weight (45.9% each) reported by non-medical males. (Table 6)

Table 6. Distribution of university students regarding their opinion of influence of life style on fertility stratified by gender.

Life style factors (yes)	University students								significance					
	Medical				Non-Medical				Medical			Non-Medical		
	No.	%	No.	%	No.	%	No.	%	χ^2	df	P	χ^2	df	P
Caffeine	30	75	28	80	18	47.4	16	43.2	6.286	1	0.012	10.225	1	0.001
Alcohol	29	72.5	31	88.6	17	44.7	16	43.2	6.208	1	0.013	16.304	1	0.000
Smoking	32	80	27	77.1	17	44.7	17	45.9	10.375	1	0.001	7.366	1	0.007
Exercise	21	52.5	22	62.9	11	28.9	13	35.1	4.468	1	0.035	5.533	1	0.019
Excessive weight	29	72.5	28	80	16	42.1	17	45.9	7.376	1	0.007	8.899	1	0.003
Under weight	30	75	29	82.9	15	39.5	14	37.8	10.077	1	0.002	15.154	1	0.000
Diet	29	72.5	27	77.1	18	47.4	18	48.6	5.139	1	0.023	6.231	1	0.013

The majority of medical students reported IVF as presumed behavior in case of infertility more than non-medical students (85.7% of males and 70% of females vs. 37.8% of males and 31.6% of females respectively). In contrast, a higher proportion of non-medical students reported an adoption and not to have children as a choices

than medical students (39.5% of females and 35% of males vs. 7.5% of females and 2.9% of males, 28.9% of females and 27% of males vs. 22.5% of females and 11.4% of males respectively) (χ^2 : 14.558, df: 2, $P = 0.001$ and χ^2 : 18.634, df: 2, $P < 0.001$). (Table 7)

Table 7. Presumed behavior in case of infertility among university students regarding to their gender

Presumed Behavior	University students								Total			
	Medical ^a				Non-Medical ^b				Female		Male	
	Female		Male		Female		Male		Female		Male	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
IVF	28	70	30	85.7	12	31.6	14	37.8	40	51.3	44	61.1
Adoption	3	7.5	1	2.9	15	39.5	13	35.1	18	23.1	14	19.4
Choose not have children	9	22.5	4	11.4	11	28.9	10	27	20	25.6	14	19.4
Total	40	100	35	100	38	100	37	100	78	100	72	100

a: χ^2 : 14.558, df: 2, P = 0.001; b: χ^2 : 18.634, df: 2, P = 0.000

The majority of medical students expected a higher percent of IVF success 40-100%, compared to those in non-medical college whose expect a lower degree of success 0-19% (70% of females and 68.6% of males vs.

42.1% of females and 40.5% of males respectively) (χ^2 : 31.217, df: 3, P < 0.001 and χ^2 : 27.931, df: 3, P < 0.001). (Table 8)

Table 8. University Student's expected chance of IVF success to got a child regarding to their gender.

Chance	University students								Total			
	Medical ^a				Non-Medical ^b				Female		Male	
	Female		Male		Female		Male		Female		Male	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0-19%	2	5	1	2.9	16	42.1	15	40.5	18	23.1	16	22.2
20-29%	5	12.5	4	11.4	10	26.3	11	29.7	15	19.2	15	20.8
30-39%*	5	12.5	6	17.1	8	21.1	6	16.2	13	16.7	12	16.7
40-100%	28	70	24	68.6	4	10.5	5	13.5	32	41	29	40.3
Total	40	100	35	100	38	100	37	100	78	100	72	100

a: χ^2 : 31.217, df: 3, P = 0.000; b: χ^2 : 27.931, df: 3, P = 0.000

*The category that contains the correct answer according to the published data. [5]

4. Discussion

In this study, the intention for parenthood was higher among non-medical students than medical one. While medical students had a higher awareness about fertility issues than non-medical students, but they still delayed commencement of childbearing and wanted to have fewer children and this was similar to what has been reported particularly among highly educated women in other study. [13]

In our study, we found that fertility awareness in general and the knowledge of specific factors that have effect on fertility in particular are unreliable among many young non-medical male students, and in addition underestimated the effect of age on fertility while overestimating the length of female reproductive period as demonstrated in previous study. [14] This overestimation may be one factor contributing to the finding that, a large proportion of female students will postpone the first pregnancy. Then the necessity of education about the leading factors for infertility is mandatory particularly among non-medical students. [15]

Both medical and non-medical students were able to describe infertility as a biomedical health problem and could identify multiple risk factors for male and female infertility, but they still lacked significant knowledge regarding age related decline in female fertility. This confusion could be released by basic understanding of male and female reproductive system, sexual education, puberty and menopause.

The majority of medical student reported IVF as a choice in case of infertility more than non-medical students, this is indicative that education level has a strong prediction in seeking medical help especially among female students with infertility and this is consistent with those of previous studies, [16] but the students still lack of knowledge about this procedure and they overestimate its success rate even among medical students, in contrast to non-medical students as they underestimate it, and this results were in line with finding of other studies. [17,18]

So health care professionals especially family doctors must be aware of the importance of providing comprehensive reproductive health counseling to young women and this education should be offered to all women seen in the routine screening.

5. Conclusion

Students in this study significantly estimate every aspect of female fertility including the factors that affect fertility especially the age and the success rate of IVF treatment.

Although male and female students plan to have their first and last child within a women's' window of fertility, the vast overestimate of female fertility could lead to delayed child bearing and involuntary childlessness. So, there is need for increasing efforts to improve the knowledge about fertility and the importance of comprehensive reproductive health not only for university students but for all young population throughout the different educational courses like lectures, seminars, workshop and etc.

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