Determinants of Inter-Conception Interval among Southern Jordanian Women

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Abstract

Objective: To determine which socio-demographic factors influence the inter-conception interval in southern Jordan.

Methods: A cross sectional study on a sample of 307 Jordanian women was performed. All women were interviewed using several questionnaires providing information on the socio-demographic characteristics, obstetric history and other health related data. Anthropometric measurements as well as blood pressure were conducted on each case.

Results: The low standard of education and occupation of the husband and spouse, low monthly family income, an increased family size, and extended family type were all significantly associated with short inter-conception interval. Attending health education programs on different aspects of maternal and child health care, using proper family planning method and breast feeding were significantly associated with increased length of inter-conception interval.

Conclusions: Repeated pregnancies at short intervals are common in the southern region of Jordan, and short inter-conception interval is a multi-dimension problem. Among the suggested methods to prolong inter-conception interval include; increasing the literacy and employment rates of parents to upgrade their economic status, an in-depth health education and social mobilizations in various agencies are still needed to maximize the use of contraception methods, and improving the standards of exclusive breast-feeding practice.

Keywords: Inter-conception Interval; Lactation Amenorrhea; Inter-birth Intervals; Fertility Control; Family Planning.

Introduction

The determinants of birth intervals have been a focus of attention because of the strong relationship between birth intervals, mortality and fertility. Several studies revealed that short and long inter-birth intervals increase the risk of adverse pregnancy outcomes which affect child survival and well being[1-6]. Therefore, it is important to look at environmental and socio-demographic determinants in the community as well as personal characteristics of the mothers that might increase inter-pregnancy interval to an optimal range of 18 to 23 months[2,7-9].

Health planners in developing countries including Jordan are currently paying great attention to the role of lactation amenorrhea on

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prolonging inter-birth interval and hence reduce fertility and control population growth rate[10,11] Reports on the impact of socio-demographic characteristics of the mothers on inter birth interval are equivocal[5,7,12,13]. Age at menarche, age at marriage, education and occupation of the mother as well as the use of contraception are found to affect inter-conception interval[14-17].

The high fertility rate in Jordan[18] and the shortage of information about determinants of inter-conception Interval (ICI) among Jordanian women formed the rational background of the current study which aims to investigate the relationship between socio-demographic characteristics as well as maternal health aspects of the mothers and the ICIs among women in the southern region of Jordan.

Materials and Methods

The study was a part of a large cross section household survey carried out at the Karak Governorate in the Southern region of the Hashemite Kingdom of Jordan during the years 2004 and 2005 to assess the health status of the community. The sampled population was male and female subjects from 12 through 90 years of Jordanian ethnic origin. The standard cluster sampling technique was used to select the study population from 30 administrative districts representing the Karak-Governorate[19]. All married women in the sample (total number = 307) who conceived at least twice were included in the study. All volunteers were interviewed using structured questionnaires which provided information on both personal and socio-demographic characteristics, as well as their obstetric and medical histories. Anthropometric and blood pressure measurements were also obtained for each woman using standard techniques and

equipment. The outcome variable was the average of the inter-conception intervals for each woman. It was defined as the period from the date of birth of the previous child or outcome of pregnancy to the estimated conception date of the next child. It was considered short if less than 12 months.

Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) Version11. Simple as well as multi-factorial statistical tests such as multiple regression and principal component analysis were employed using varimax rotation to make variables orthogonal[20]. Data were considered significant if p value ≤ 0.05, where α level was taken to be 0.05.

Results
Socio-demographic and Health Characteristics of Studied Women:

The family, personal and health characteristics of the studied women are shown in **Table 2.** About one-quarter of the husbands (25.4%) were illiterate and almost one-third (30.3%) were unemployed. The monthly income for the majority of families (75.3%) was ≤ 300 JDs. About 8% of the women lived in extended families and the majority of families (45%) were ranging from 5 to 7 members. Unemployment and illiteracy rate were high among women (36.5% and 24.8% respectively), and 10% were smokers. More than 40% of the women conceived more than 5 times, and almost a similar percentage (39.7%) had at least one abortion.

Approximately, one-fifth of the women (18.7%) did not breast-feed their children and one-third (32.6%) did not use any family planning methods. ICI was ≤ 2 years in the majority of women (85%) and was less than one year in almost half of them. About one-third of the women did not receive any health

education about pregnancy, feeding of infants, and family planning during antenatal care periods (34.0%, 30.2%, and 31.6%, respectively).

Table 1. The socio-demographic characteristics of the studied population are detailed below

Socio-Demographic characteristics	Average	Standard deviation
Menarche	13.9 years	1.2 years
Age of Marriage	21 years	4.7 years
Age of first conception	22 years	4.4 years
Number of pregnancies per women	5.6 pregnancies	3 pregnancies
Number of abortions	1.86 abortion	1.1 abortion
Interval between first and second pregnancies	21.4 month	15.8 month
Interval between pregnancies	19.3 month	11.1 month
Age at first use of family planning	27.1years	4.7 years
Duration of lactation	11.4 month	6.2 month

Table 2. Distribution of the studied population according to family, personal and health characteristics

Characteristics	Percentages (%)
Husbands	
Illiterate	25.4
Unemployed	30.3
Income ≤150 JDs	38.8
151 − 300 JDs	36.5
> 300 JDs	25.7
Type and size of families	
Extended	08.3
≤ 4	26.7
5 − 7	45.0
8 +	28.3
Characteristics of mothers	
Unemployed	36.5
Illiterate	24.8
Smokers	10.1
> 5 pregnancies	41.0
≥ one abortion	39.7
Do not breast feed their babies	18.7
Do not use family planning methods	32.6
ICI < one year	44.6
1 − 2 years	42.3
> 2 years	13.1
Health education during maternity about:	
Pregnancy	66.0
Feeding babies,	69.8
Family planning,	68.4

Determinants of ICI among Studied Women:

Table 3 demonstrates the relationships between ICI and some family characteristics. ICI was significantly increased (> 12 months)

Table 3. Distribution of the studied women at Al-Karak Governorate according to Inter Conception Interval (ICI) and socioeconomic status of the family

Variables	Inter Conception Interval (ICI)				x^2	P-value
	≤ 12 months		> 12 months			
	No	%	No	%		
Education of husband						
Illiterate	56	71.8	22	28.2		
Read and write	11	73.3	4	26.7		
Essential	13	43.3	17	56.7		
Secondary	24	35.3	44	64.7		
University	26	29.5	62	70.5		
Higher education	7	25.0	21	75.0	43.18	0.000
Occupation of husband						
Higher clerical	17	41.5	24	58.5		
Average clerical	13	21.3	48	78.7		
Skilled workers	7	36.8	12	63.2		
Semiskilled workers	7	50.0	7	50.0		
Unskilled workers	38	48.1	41	51.9		
Unemployed	55	59.1	38	40.9	22.53	0.000
Type of the family						
Nucleus	118	42.0	163	58.0		
Extended	19	73.1	7	26.9	09.31	0.002
Family Size						
≤ 4	46	56.1	36	43.9		
5 – 7	46	33.3	92	66.7		
8 +	45	51.7	42	48.3	13.26	0.001
Family Income (JD) per month						
≤ 150	73	62.9	43	37.1		
151 - 300	45	40.2	67	59.8		
301 +	19	24.1	60	75.9	30.16	0.000

when the educational level of husbands increased (x^2 = 43.18, p= 0.000), while it was significantly decreased (≤12 months) when husbands were unemployed (x^2 = 22.53, p= 0.000). Women who lived in extended families significantly tended to have ICI ≤12 months (x^2 = 9.31, p= 0.002). Moreover, short ICI was more encountered among women who came from very small or very large families (x^2=13.26, and p=0.001). ICI was significantly

decreased (≤12 months) among women with family income of ≤ 150 JDs per month, while it was significantly increased (>12 months) in families with an income of ≥ 300 JDs per month (x^2 = 30.16, p= 0.000).

Table 4. Distribution of the studied women at Al-Karak Governorate according to Inter Conception Interval (ICI) and some personal characteristics of the mothers

Variables	Inter Conception Interval (ICI)				x^2	*P*-value
	≤ 12 months		> 12 months			
	No	%	No	%		
Occupation of mother						
			38	33.9		
Unemployed	74	66.1				
Unskilled	14	63.6	08	36.4		
Semiskilled	05	27.8	13	72.2		
High clerical	18	28.6	45	71.4		
Average clerical	26	28.3	66	71.7	42.67	0.000
Education of mother						
Illiterate	53	69.7	23	30.3		
Read and write	11	84.6	2	15.4		
Essential	11	45.8	13	54.2		
Secondary	15	39.5	23	60.5		
University	45	30.6	102	69.4		
Higher education	02	22.2	7	77.8	41.74	0.000
Health education about feeding of baby						
Received	81	37.7	134	62.3		
Not received	56	60.9	36	39.1	14.03	0.000
Health education about pregnancy						
Received	78	38.6	124	61.4		
Not received	59	56.2	46	43.8	8.64	0.002
Health education about family planning						
Received	76	36.2	134	63.8		
Not received	61	62.9	36	37.1	19.14	0.000
Health education about rearing babies						
Received	74	37.4	124	2.6		
Has not received	63	57.8	46	42.2	11.87	0.000
Family planning method						
Not used	59	59.0	41	41.0		
Used	71	36.0	167	64.0	11.87	0.000

Table 4 shows the relationship between ICI among surveyed mothers and some personal

and maternal characteristics. ICI was significantly shorter among unemployed and unskilled women (66.1 and 63.6% ≤12 months, $x^2 = 42.67$, p= 0.000), and among who were illiterate or just could read and write (69.7% and 84.6% ≤12 months, $x^2 = 41.74$, p= 0.000). The ICI was significantly decreased (≤12 months) among women who did not receive any health education about feeding, rearing a baby, and pregnancy and family planning (p values for all these relationships were ≤ 0.002). Short ICI was also significantly

encountered among those who did not use any family planning methods (x^2=11.87, p= 0.000).

Table 5 reveals loading of the different variables on the rotated principal components factors. Increased ICI was significantly associated with increased age at menarche, duration between first and second conception, and with increased duration of breast feeding (all have loading greater than 0.3 on factor 3 which also had high loading for the variable average ICI).

Table 5. Rotated component matrixes for relationship between average ICI and mother maternal variables

	Component Matrix				
	1	2	3	4	5
Family size	-.486	5.328E-03	-1.790E-02	.505	2.302E-02
Income per month	.466	-.287	.215	.304	3.918E-02
Age at menarche	.188	-.232	.347	2.842E-02	-4.760E-02
Age at marriage	.927	-9.454E-02	7.310E-02	-8.307E-03	-3.557E-02
Age at first marriage	.914	-9.073E-02	.102	-3.474E-02	-4.702E-02
Number of abortions	-9.997E-02	.139	-2.282E-02	5.557E-02	.844
Number of abortions in early three months	2.881E-02	-4.184E-02	3.467E-02	9.410E-02	.868
Average number of months between pregnancies	.125	-.156	.778	.121	7.709E-02
Number of months between first and second pregnancies	.158	6.946E-02	.702	9.169E-02	-.142
Average duration of breast feeding	-.172	-2.420E-02	.586	-.257	.149
Weight	-4.626E-02	.186	-1.627E-02	.811	.124
Height	.380	-.147	7.898E-02	.643	4.809E-02
SBP	-.201	.861	-9.170E-02	-6.698E-03	.120
DBP	-.113	.881	-7.450E-02	.111	-2.244E-02
Age	-.671	.400	-7.432E-02	-.219	7.026E-02

Table 6 shows the results of linear regression analysis which reveals the relationship between ICI and some variables.

Increased age at menarche was significantly associated with increased duration of ICI (t=-2.29, p=0.023). Also Increased age at first

marriage was significantly associated with increased duration of ICI (t= 2.503, p=013). Increased duration of breast feeding was

significantly proportional to the increased duration of ICI (t=4.654, and p=0.000)**.**

Table 6. Correlation/ regression relationship between ICI and some maternal variables

ICI	B	Std. Error	Beta	t	Sig.
(Constant)	- 15.079	8.934		-1.688	0.93
Average duration of breast feeding	0.512	0.110	0.278	4.654	0.000
Age at marriage	0.386	0.154	0.153	2.503	0.013
Age at menarche	1.473	0.643	0.140	2.290	0.023

Discussion

High fertility rate is a major concern to the health planners particularly in developing countries, therefore investigation of ICI and analysis of its determinants could provide insight into factors underling this problem[13,16,18]. Prolonging inter-birth intervals reduces the number of children that the woman bears during her reproductive period. This can significantly reduce fertility in the community which is positively reflected on the child and woman's health[2,8,21,22]. Karak area is the biggest governorate in the southern region of Jordan, the community in which is semi-urban in structure with high unemployment and illiteracy rates among heads of families and mothers (30.3% and 36.4% respectively, for unemployment, 25.4% and 24.8% respectively for illiteracy). This community is characterized by high parity and large families (28.3% of the families have 8 or more members), as well as low monthly income per family (75.3% of the families have 300 JD or less per month). The low average ICI among mothers is consistent with other previous studies that revealed a low socio-

economic condition proportional to the short inter-pregnancy interval[23-26]. The present study revealed that a decreased level of education and occupation of the husbands, and the decreased income of the family as well as a large family size were all significantly associated with short inter-conception interval. This is consistent with other studies which reported similar conclusions[17,23,26-29]. Education and productive employment of the women are among the indicators of their development[5] and have significant impact on the inter-pregnancy interval[14,15,30]. The present study confirmed these findings where 36.5% of the mothers were illiterate; about 25% were unemployed; and majority of them were with short ICI (≤ 12 months).

Regarding the age at menarche, the present study appeared to be similar to those of a study carried out on 517 Berber peasant women in Morocco which showed that age at menarche was positively associated with the inter-birth interval[31]. This correlation needs further research to reveals a possible physiological role.

Past researches on the breast feeding as a

method of child spacing consistently indicated that the longer the breast-feeding, the longer is the lactation amenorrhea, and consequently, a longer inter-pregnancies interval[10,11,14,32,33]. This finding is consistent in our present study where the duration of breast feeding positively affected the ICI and formed a positive strong predictor of its duration. Therefore, breast feeding as a measure of family planning should be encouraged in this region of Jordan by health care delivery personnel as very few women rely on breast feeding as a family planning method.

The current study also showed that practicing of family planning methods appeared to be the major factor behind prolongation of ICI. This is similar to previous reports on women in other Asian and African countries[24, 26]. Although a large percentage of the women in the southern region of Jordan (67.4%) were aware of, and use family planning methods, and despite early age of marriage (21 years), they started to use family planning methods for the first time at age 27 years. This to some extent minimizes the importance of family planning to control fertility.

Although, health education is an important element of primary health care adopted by the Ministry of health in Jordan, particularly in maternal and child health care, its application is not sufficient where over one-third of the women in this region did not receive any health education during their antenatal care visits which was significantly associated with short ICl.

Conclusion

The present study although data is 9 years old still suggests that repeated pregnancies at short intervals are common in the southern region of Jordan; and short inter-conception interval is a multi-dimension problem in this community. Several ways can be suggested to prolong ICI. Increasing the literacy and employment rates of women to upgrade their economic level is needed. Much in depth health education and social mobilizations in various agencies are still needed to maximize the use of contraception methods. Standards of exclusive breast-feeding practice need to be improved. Therefore, health education of women in general and mothers in particular especially in Maternity units may be a solution.

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تحديد الفترة الزمنية بين الولادات لدى النساء في جنوب الأردن

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الملخص

الهدف: تحديد العوامل الاجتماعية والسكانية التي تؤثر بالفترة الزمنية بين الولادات في جنوب الأردن.

الطريقة: هذه دراسة مقطعية من عينة تتكون من 307 سيدة أردنية. تمت مقابلة السيدات لتحديد العوامل الاجتماعية والسكانية التي تؤثر على المباعدة بين الولادات.

النتائج: انخفاض مستوى التعليم ومهنة الزوج وتدني الدخل الشهري وزيادة عدد أفراد الأسرة كانت كلها عوامل مؤثرة أدت إلى انخفاض المدة الزمنية بين الولادات.

حضور ندوات تعليمية بخصوص صحة الأم والطفل وتنظيم الأسرة والرضاعة الطبيعية كانت كلها عوامل مؤثرة أدت إلى الزيادة المدة الزمنية بين الولادات

الاستنتاجات: عدم المباعدة بين الولادات منتشر في جنوب الأردن. لزيادة المدة بين الولادات يجب وضع خطط لزيادته التوعية الصحية ومكافحة البطالة والفقر.

الكلمات الدالة: الفترة الزمنية بين الولادات، انقطاع الطمث بسبب الرضاعة، تنظيم الأسرة.