Factors Affecting Unplanned Pregnancy in Semnan Province, Iran

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A R T I C L E I N F O	A B S T R A C T
	Background & aim: Despite the success of family planning programs in Iran in the recent decades, considerable proportions of pregnancies are still unintended and can be a cause of poor mental and physical health of the mother and child. The aim of this study was to investigate some important factors affecting uplanned pregnancies among married women in Semnan province, one of the developed provinces of Iran with below replacement fertility level.

Methods: The data for this study were drawn from a cross-sectional survey conducted in Semnan province in 2014. A total of 363 married women within the age range of 15-49 years who were pregnant or had the history of at least one delivery were considered. The study sample was selected using multi-stage stratified sampling method. The data were collected using a self-structured questionnaire with 90 items and Cronbach's alpha coefficient of 0.88. Data analysis was performed in SPSS (version 20) using Crammer's V coefficients and Chi-square tests. Logistic regression analysis was also applied to model the risk of unintended pregnancies based on selected covariates.

Results: According to the results, around 18.2% of the pregnancies were unplanned, 7.7% and 10.5% of which were mistimed and unwanted, respectively. Based on the logistic regression analysis, birth cohort, number of children ever born, and contraceptive methods had significant effects on the risk of unintended pregnancies. Furthermore, about 48% of the women experiencing unintended pregnancy were using a traditional contraceptive method before or at the time of the conception.

Conclusion: As the findings indicated, the women who used contraceptive method, as well as those with higher number of children and younger birth cohorts had higher risk of unplanned pregnancies. It should be noted that the majority of unplanned pregnancies among the women in younger birth cohort were mistimed pregnancies. So it is recommended to continue offering family planning and health services to these women in order to prevent unplanned pregnancy, unsafe abortion, and many chronic diseases.

Introduction

Iran could be considered as a successful and pioneer developing country with respect to family planning programs. The national Total Fertility Rate in this country declined from 5.6 births per woman in 1985 to 1.9 births per women in 2006 (1, 2). After the determination of fertility reduction as the main policy of the Iranian national population in 1980s, contraceptive methods were made available across the country and the use of these methods rouse from 49% to 70% in 1990.

In addition, there was a concomitant increase in the proportion of the married Iranian women using modern contraceptive

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methods, rising from 26% in 1976 (3) to 56.98% in 2011 (4). Despite the success of the family planning programs, a significant proportion of the pregnancies are still unplanned (5, 6). Unplanned births consist of those occurring sooner than desired (i.e., mistimed), and those that are not wanted at all (i.e., unwanted) (5, 7).

According to the literature, an unplanned pregnancy has a direct impact on total fertility rate (8) and leads to lower birth interval and larger completed family size (9). On the other hand, unplanned pregnancy can be associated with infanticide and increase the rate of abortion. Accordingly, this kind of pregnancy bears consequences on mother's, her child's, and society's quality of life and results in poorer mental and physical health of the mother and child, as well as maternal morbidity and mortality.

Previous studies have shown that the women with unplanned pregnancies had poorer health outcomes than those who were able to effectively implement their fertility preferences (10-12). Moreover, the children who were unplanned have been reported to have poorer health status (13-15). A meta-analysis study showed that about one-third of the pregnancies in Iran are unplanned (5).

Abbasi-Shavazi et al. (16) reported that 35% of the 5,427 pregnancies were unplanned, 19% and 16% of which were mistimed and unwanted, respectively. In a study carried out by Rashidi et al. (2017), the unwanted pregnancy rate in Tehran was 31.6% (17). Regarding this, it is expected that the policymakers and program planners in the public health sector give more concern regarding offering accurate information and more effective contraceptive methods to the women wishing to stop childbearing.

However, when total fertility rate in Iran reached to below replacement level in 2006, many researchers and policy makers focused on the necessity of changing demographic policies and family planning programs. They identified the availability and free access of the contraceptive methods across the country as the main causes of fertility rate reduction (18). Although this reduction has been partially affected by an explicit and official national population policy since late 1980s, the demographers and researchers in this field believe that this unprecedented fertility decline in Iran has been caused by a combination of multiple factors (19).

Delayed marriage, decreased infant's mortality, rural development, economic problems (e.g., unemployment and inflation), rising standard of living, high costs of child rearing and education, and increased maternal education levels are some of the most influential factors for the decrease in fertility rate (19-25). Variations in individual's values and attitudes toward marriage, childbearing, and tendency to have ideal family and children with high quality of life are other factors exerting important effects on fertility rate reduction (26).

There are controversies regarding the family planning programs among the researchers, leading to new discussions and planning in this field. One of the important plans, which is in contradiction with the previous family planning program was to cut or restrict the availability of free contraceptive services (18, 27). This limitation may increase unplanned pregnancies, which may lead to induced abortion. According to the literature, the women experiencing unplanned pregnancy decide to terminate their pregnancy due to such reasons as limited financial resources, lack of spouse's support in caring of children, as well as spousal addiction and bad behavior (28, 29).

In Iran, abortion is legal only if pregnancy threatens the health of mother and her infant or leads to the birth of a disabled child (30). Although legal and religious constraints may somewhat play an important role in people's decision about abortion, decision making sometimes gets out of control, and a woman may try to abort her child through illegal methods. In these circumstances, where induced abortion is illegal, unsafe abortions take place underground (28).

According to Iran's Ministry of Health, most of the around 80,000 abortions annually occurring in Iran are illegal and unsafe (31). Erfani and McQuillan estimated that more than 73,000 unsafe abortions are performed annually in Iran as a result of unplanned pregnancy (32). The World Health Organization estimates that

unsafe abortions account for 1 maternal mortality per 8 cases (33).

Therefore, from the public health and family planning perspectives, it is important to explore the risk factors of unplanned pregnancy (both unwanted and mistimed). Semnan is a province in Iran taking efficient steps toward development and modernization. Nowadays, this province is considered as one of the developed ones. This province reached below replacement fertility level in 1996 (2).

Based on the results of the Demographic and Health Survey (2010), 78.58% of the married women in this province used a family planning method, 55.46% of whom used modern contraceptive methods (4). According to various studies (5, 34), the prevalence of unintended pregnancy in Semnan is within 26-32%. The aim of this study was to study some factors affecting unplanned pregnancies in Semnan province in 2014.

Materials and Methods

This cross-sectional study was conducted using the results of the Iranian National Population and Housing Census (35, 36). A total of 363 married females selected the multi-stage stratified sampling method in 2014 were considered in this study. The sample size was determined using the Cochran's sample size formula. Out of the 405 married women aged within 15-49 years, 89.6% (363 cases) of cases experienced at least one pregnancy and 10.4% (42 cases) of them had no such experience. Therefore, after the exclusion of the latter group from the study, the final sample population consisted of 363 married women. In this survey, the women's last pregnancy was categorized as "wanted", "mistimed", and "unwanted". In addition, in the multivariate analysis, "mistimed and unwanted" pregnancies were considered as unplanned pregnancies.

The data were collected by means of a self-structured questionnaire entailing 90 items with the Cronbach's alpha efficient of 0.88. The questionnaire enquired about some information regarding the contraceptive methods used in the last pregnancy, birth cohort, place of residence, occupational status, education level, number of children ever born, and ideal number of children. In demographic studies, birth cohort is referred to a group of people born at the same time.

In this study, birth cohort was considered as an ordinal variable in three year categories of 1960s, 1970s, and ≥ 1980s. Women in the age ranges of 15-31, 32-41, and 42-49 years were considered as ≥ 1980s, 1970s, and 1960s birth cohorts, respectively. The effect of covariates on the risk of unplanned pregnancies was investigated using binary logistic regression in SPSS software (version 20). P-value less than 0.05 was considered statistically significant.

Results

The cross tabulation and interested covariates of pregnancy types are presented in Table 1. According to this table, around 18.2% of the pregnancies were unplanned, 7.7% and 10.5% of which were mistimed and unwanted, respectively. Furthermore, 35.5%, 38%, and 26.4% of the women were in the first, second, and third birth cohorts, respectively. Regarding the place of residence and occupational status, 75.2% of the women lived in urban areas, and 21.2% of them were employed.

The females were almost equally distributed (33%) in terms of their education level. The majority of the women in this study had two children (50.1%) and considered two children as an ideal number (70.2%). Only 12.4% of the women used the modern contraceptive methods. Furthermore, 81.8% of the women experienced wanted pregnancy. Wanted pregnancies increased by decreased age; in this regard, 77.5%, 80.4%, and 89.6% of the pregnancies were wanted for 1960s, 1970s, and ≥ 1980s birth cohorts, respectively.

The majority of the unplanned pregnancies among the 1960s birth cohort were unwanted (16.3%). On the other hand, in 1970 and ≥ 1980s birth cohorts, most of the unplanned pregnancies were mistimed. Based on the results of the Chi-square test, the type of pregnancy was significantly different among the women of various birth cohorts (P=0.03). The women who lived in urban areas had more wanted pregnancies (83.2%), compared to those

Table 1. Cross tabulation and interested covariates of pregnancy type

Variables	Values	Type of pregnancy	Symmetric	P-value**

			Wanted	Unplanned pregnancy		Total	Measures*	
				Unwanted	Mistimed			
Birth cohort	1960s	N	100	21	8	129		
		%	77.5	16.3	6.2	100		
	1970s	N	111	13	14	138	0.121	0.03
		%	80.4	9.4	10.1	100		
	≥1980s	N	86	4	6	96		
		%	89.6	4.2	6.3	100		
Place of residence	Urban	N	227	26	20	273		
		%	83.2	9.5	7.3	100	0.062	0.499
	Rural	N	70	12	8	90		
		%	77.8	13.	8.9	100		
Occupational status	Employed	N	63	8	6	77		
		%	81.8	10.4	7.8	100	0.002	0.999
	Unemployed	N	234	30	22	286		
		%	81.8	10.5	7.7	100		
Education level	Secondary and lower	N	78	25	17	120		
		%	65.0	20.8	14.2	100.		
	High school	N	107	9	7	123	0.315	<0.001
		%	87.0	7.3	5.7	100		
	Academic	N	112	4	4	120		
		%	93.3	3.3	3.3	100		
Parity	1	N	78	0	1	79		
		%	98.7	0.0	1.3	100		
	2	N	162	4	16	182		
		%	89.0	2.2	8.8	100	0.681	<0.001
	3	N	33	8	9	50		
		%	66.0	16.0	18.0	100		
	≥ 4	N	12	26	2	40		
		%	30.0	65.0	5.0	100		
Ideal number of children	0	N	13	0	1	14		
		%	92.9	0.0	7.1	100.0		
	1	N	33	3	4	40		
		%	82.5	7.5	10.0	100		
	2	N	206	28	21	255	0.146	0.445
		%	80.8%	11.0%	8.2%	100.0%		
	3	N	24	6	2	32		
		%	75.0	18.8	6.2	100.0		
	≥ 4	N	21	1	0	22		
		%	95.5	4.5	0.0	100.0		
Contraceptive methods	Traditional	N	20	21	11	52		
		%	38.5	40.4	21.2	100		
	Nothing	N	251	5	10	266	0.400	<0.001
		%	94.4	1.9	3.8	100		
	Modern	N	26	12	7	45		
		%	57.8	26.7	15.6	100		
Total		N	297	38	28	363		
		%	81.8%	10.5%	7.7%	100.0%		

*Crammer's V, **Pearson Chi-square test

living in rural areas (77.8%). The type of pregnancy was not significantly different among the women based on their place of residence (P=0.499).

The type of pregnancy pattern was the same for both employed and unemployed women (P=0.999). Most of the pregnancies were wanted (almost 82%), and almost 8% of them

were mistimed in both occupational status. The rate of unwanted pregnancies decreased along with the increased education level. This association could be confirmed by the value of Cramer's V coefficient (0.315). Only 6.6% of the pregnancies for the highly educated women were unplanned, while the secondary and less educated women had the unplanned pregnancy rate of 35%. This difference was statistically significant (P<0.001).

Unplanned pregnancy directly varied by the number of children ever born. As the number of children ever born increased, the percentage of unplanned pregnancy also enhanced. Cramer's V value (0.681) was indicative of the strong association between the number of children and type of pregnancy. Women with four and more children had the highest rate of unwanted pregnancies (65%). However, the women having one child had no case of unwanted pregnancy and only 1.3% mistimed pregnancies. Among the women with two children, 2.2% and 8.8% of the unplanned pregnancies were unwanted and mistimed, respectively. The same patterns existed for the women with the parity of 3.

There was no significant relationship between the ideal number of children and type of pregnancy (P=0.445). Most of women with 1,2,3, and 4 or more ideal number of children had wanted pregnancies (82.5%, 80.8%, 75%, and 95.5%, respectively). Regarding the contraceptive methods, most of the women who did not use contraceptive methods had wanted pregnancies (94.4%). Additionally, 61.6% and 42.3% of the pregnancies were unplanned for

the women using traditional and modern contraceptive methods, respectively.

Both mistimed and unwanted pregnancies were more common among the women utilizing traditional (40.4% and 21.2%, respectively) or modern contraceptive methods (26.7% and 15.6%, respectively), compared to those not using any birth control methods. These differences were statistically significant (P<0.001).

In this study, the examination of the simultaneous effects of all covariates on the risk of unwanted pregnancy among the women was accomplished through using binary logistic regression model fitted based on the type of the dependent variable. The risk of unplanned pregnancies (i.e., mistimed and unwanted pregnancies) was modeled by logistic regression based on women's birth cohort, place of residence, occupational status, education level, children ever born, ideal number of children, and contraceptive methods based on backward methods.

Model's goodness of fit was determined and confirmed by Hosmer and Lemeshow test (P=0.72) and Nagelkerke R-square (0.62). According to the results of the fitted model, only three variables, namely women's birth cohort, children ever born, and contraceptive methods, were remained in the final model showing a significant effect on the risk of unplanned pregnancies (Table 2).

The older women, who were born in 1960s and 1970s birth cohorts, had smaller odds ratio of unplanned pregnancies, compared to the younger ones. The odds ratio for the women's children ever born (8.930) indicated that by the

Table 2. Unplanned pregnancy regressed on interested covariates[1]

Variable	Level	B	S.E.	Wald	df	Sig.	OR*	95% confidence interval for OR	
								Lower	Upper
Birth cohort	1960s	-3.150	0.826	14.560	1	0.001**	0.043	0.006	0.248
	1970s	-1.250	0.552	5.131	1	0.024**	0.287	0.063	0.788
	≥1980s (ref)			11.601	2	0.003			
Children ever born		2.189	0.352	38.738	1	<.001**	8.930	3.906	15.887
Contraceptive method	Traditional	0.594	0.545	1.189	1	0.276	1.811	0.450	4.333
	Nothing	-2.354	0.499	22.272	1	<.001*	0.095	0.029	0.234
	Modern (ref)			40.292	2	.000			

[1] Based on backward method: P<0.05 and P>0.1 were considered for entering and deleting variables, respectively.
*Odds ratio, **significant at 0.05 level

enhancement of the number of children, the

odds ratio of the unplanned pregnancies

increased. Therefore, women's odds of unplanned pregnancies got 8.930 times higher by having one more children. The women's odds of unplanned pregnancies for those who did not use contraceptive methods were also 0.095 times less than that of the females using modern contraceptive methods.

Discussion

The investigation of the factors affecting unplanned pregnancies can facilitate the recognition of the changes in the reproductive behaviors of the married women. The improvement of the reproductive health of the Iranian women requires the identification of contraceptive behaviors and the factors contributing to unplanned pregnancies. In the recent years, women's childbearing age has been limited to the age range of 25-32 years. There are many young women using counteractive methods in their peak fertility age (37). However, a significant proportion of pregnancies are still unwanted (5, 6).

Unplanned births are associated with many side effects, such as delayed prenatal care, low incidence and duration of breastfeeding, poor maternal mental health, child's mental and physical health, and poor educational and behavioral outcomes for the child, and low-quality mother-child relationship (38). To prevent unwanted pregnancies and induced abortions, new health policies should be considered. In general, causal associations are not easily inferred from most studies of the events that follow unplanned pregnancies.

Indeed, some studies have found that the observed relationships were greatly attenuated after controlling for the factors preceding unplanned pregnancies, such as a woman's socioeconomic status (39, 40).

The identification of the various consequences of unplanned births across populations can be facilitative in motivating and effectively allocating investments targeting toward the improvement of maternal and child health and, in the long term, social and economic development. In line with the below replacement level and decreasing fertility rate in Iran in the recent years, the fertility pattern has been also changed in most of the provinces (2). Regarding this, the investigation of the health effect of this

phenomenon is very important for health planning purposes.

The results of the fitted logistic regression demonstrated that the risk of unplanned pregnancies varied significantly among the women of different birth cohorts. In this regard, the women in the youngest birth cohort (≥1980s) had a higher risk of unplanned pregnancy, compared to those in other birth cohorts. For these women, the majority of the unplanned pregnancies were mistimed. The high proportion of mistimed pregnancy in younger cohorts suggests that the younger women want to postpone their childbearing and make a distance between their marriage and pregnancy. The women who decide to delay childbearing often use temporary modern contraceptive methods, such as pill and condom, or traditional methods (16).

According to Table 1, 16.3% of the unplanned pregnancies were unwanted among the women who were in the birth cohort of 1960s. On the other hand, the women in younger cohorts had an unwanted pregnancy rate of 4.2%. Likewise, in the studies conducted in Arak, Tehran, and Mashhad provinces, Iran, the highest prevalence of unwanted pregnancies was observed among the women aged over 35 years, who used traditional contraceptive methods (41, 42).

The findings revealed a strong association between the number of children and unplanned pregnancy. In this respect, the risk of unplanned pregnancies elevated by increased number of children. This finding is in line with those of several studies conducted by Abbasi-Shavazi et al., Hosseini Chavoshi et al., and Razeghi Nasrabad et al. (16, 27, 28). These studies showed that the women with higher parities were more likely to terminate their pregnancy if it was unwanted. Similarly, in a qualitative study carried out in Tehran, most of the women who had unwanted pregnancies and tried to abort it had two or more children, and their ideal number of children was two (28, 29).

In a study conducted by Ebrahimzadeh et al. (2015) in 2012 to predict unwanted pregnancies in Khorramabad province, Iran, children ever born and birth interval had the highest impacts on the occurrence of unwanted pregnancies. In

the mentioned study, the odds ratio of unwanted pregnancies among the women with three or more children and a pregnancy spacing of less than four years were 6.88 times greater than that in the women experiencing their first pregnancy (29). In a study conducted by Abbasi-Shavazi et al. (2004), the prevalence of unwanted pregnancies was reported as 35%, and the number of children ever born, maternal age, and residence in rural areas were recognized as the important determinants of unwanted pregnancy occurrence (16).

The results showed that the odds of unplanned pregnancies for the females who did not use contraceptive methods were 0.08 times lower than that for the women using modern contraceptive methods. In other words, most of the women utilizing no contraceptive methods, wanted their children. The women who had mistimed pregnancy used contraceptive methods (traditional or modern); however, these methods failed. This finding was consistent with those obtained by Abbasi-Shavazi et al. (16) reporting that around 42% of the women who experienced unplanned pregnancy were using a contraceptive method.

The results of a meta-analysis carried out by Mosazadeh et al. (5) revealed that about one-third of the pregnancies in Iran were unwanted, and a high percentage of this amount was related to the women who had used contraceptives. It is worth noting that the limitation of the accessibility to modern counteractive methods would result in the increased use of traditional methods, which leads to high risk of unwanted pregnancy.

Based on the previous studies, the rate of unplanned pregnancy is expected to substantially reduce as women's education level increases (16, 43). Likewise, the results of the univariate analysis in this study indicated that higher education was associated with lower unplanned pregnancy (Table 1). However, when other factors, such as contraceptive methods, children ever born, and birth cohort, were entered to the model, education level did not have a significant effect on the risk of unplanned pregnancies anymore.

This finding was in congruence with that obtained by Erfani (2012) who reported an unplanned pregnancy rate of 20% in Tehran in 2009 (11% and 9% of which were related to mistimed and unwanted pregnancies, respectively) and indicated no association between women's education level and unplanned pregnancy. The non-significant effect of education level on unplanned pregnancy may be due to women's increasing awareness about their general health (44).

Fertility reduction to below replacement level leads to the alteration of policy views in the demographic field. Based on the statistics reported in this study, although many programs try to reduce unwanted pregnancy rate, this issue exists yet. Therefore, the implementation of studies in this field is of paramount importance. In the current study, unplanned pregnancy was investigated based on contraceptive method, number of children ever born, and birth cohort. Inaccessibility to longitudinal data is one of the important limitations of this, as well as other studies in this field in Iran. More precise results can be achieved by the execution of a longitudinal survey.

Conclusion

Recently, the Iranian government has restricted their support to family-planning services as a part of pro-natalist policy. Regarding the fact that many young women have not completed their fertility span yet, the restriction of family planning services may increase the risk of mistimed pregnancies in the near future. On the other hand, the limitation of accessibility to these services for women who are in the last year of their fertility life and have reached to their ideal number of children may lead to the enhancement of unwanted pregnancy and unsafe abortions .

This study highlighted the necessity of the resumption of the family planning programs and training younger birth cohorts as a part of national program in the health care delivery system of Iran. The improvement of public knowledge about contraceptive methods and the correct use of these methods might lead to the reduction of unplanned pregnancies over time. However, until the accomplishment of this goal, unwanted pregnancy would remain a challenge for the families living in Semnan.

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Conflicts of interest

The authors declare no conflicts of interest.

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