

DETERMINANTS OF ADOLESCENT PREGNANCY IN AN URBAN AREA IN TURKEY: A POPULATION-BASED CASE-CONTROL STUDY

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Summary. The aim of this study was to determine the degree to which socioeconomic status is a risk factor for first birth at age 19 or younger in married women in an urban area of Turkey. The research was a population-based case-control study. The study group comprised all married and pregnant women aged 15–19 (adolescent pregnancies) attending primary care centres (144 subjects). Married women between 20 and 29 years of age, experiencing their first pregnancy (adult pregnancies), were determined as the control group (144 subjects). A questionnaire was completed for each subject during face-to-face interviews. Adolescent pregnancy was more frequent in women from families with a low socioeconomic status, as determined by occupation (class) and income; both were associated with adolescent pregnancy. Multiple logistic regression analysis identified seven factors associated with adolescent pregnancy: exposure to violence within the family prior to marriage; families partially opposed or unopposed to adolescent marriage; secondary school or lower education level; lack of social security; living in houses in which the number of persons per room was over 1; unemployed women; and having sisters with a history of adolescent pregnancy.

Introduction

In recent decades adolescent pregnancy has become an important health issue in many countries, both developed and developing (Senanayake, 1990; Singh, 1998; Singh & Darroch, 2000; Ventura & Freedman, 2000; WHO, 2005; Choe *et al.*, 2005; Fine, 1998).

The risk factors for adolescent pregnancy are multiple and complex. Studies have shown that race, ethnic group, marital status, family structure, communication with parents, parents' education and employment status, adolescent's socioeconomic status, social insurance, whether or not continuing education and academic achievement are important factors in the frequency of adolescent pregnancy (Guijarro *et al.*, 1999;

Wang & Chou, 1999; Singh *et al.*, 2001; Neinstein & Farmer, 2002; Vikat *et al.*, 2002; Fesler, 2003). In addition, adolescent pregnancy has been reported to be related to physical factors such as decrease in age of menarche, frequency of sexual relationships and psychological and behavioural factors, such as physical or sexual exploitation and exposure to domestic violence or pressure (Singh & Darroch, 2000; Ventura & Freedman, 2000; Neinstein & Farmer, 2002).

Early pregnancy is an obstacle to the education of women and improvement in their social and economic status throughout the world (Senanayake, 1990; Singh *et al.*, 2001; WHO, 2005). Adolescent childbearing has been shown to be more likely among women with low levels of income and education than among their better-off peers (Singh *et al.*, 2001). A study using data from 40 Demographic and Health Surveys shows that a substantial proportion of women in developing countries continue to marry as adolescents. Education and age at first marriage are strongly associated both at the individual level and at the societal level: a woman who has attended secondary school is considerably less likely to marry during adolescence, and in countries with a higher proportion of women with a secondary education, the proportion of women who marry as adolescents is lower (Singh & Samara, 1996).

According to the 2000 Census of Turkey, the number of 15- to 19-year-old adolescents is 3,518,257. Adolescent females account for 9.8% of the overall population (Republic of Turkey, Prime Ministry, 2005). The 2003 Turkish Demographic Health Survey (TDHS, 2004) reports that among Turkish adolescents, 0.2% of 15-year-olds, 1.3% of 16-year-olds, 5.3% of 17-year-olds, 11.4% of 18-year-olds and 20.7% of 19-year-olds had either become mothers or were pregnant with their first child (TDHS, 2004). Fertility increases rapidly with age in adolescence. While the fertility rate among 15- to 19-year-olds is high – between 30 per 1000 and 200 per 1000 – in developing countries, the rate decreases to between 10 per 1000 and 80 per 1000 in the developed world (Singh, 1998; Singh & Darroch, 2000). The fertility rate in Turkey in this age group is 46 per 1000 (TDHS, 2004), which is quite high. This high fertility rate, along with adolescents making up a significant proportion of the total population, suggests that adolescent pregnancies are an important problem in the country.

Very few studies have been done in Turkey on the subject of adolescent pregnancy and almost all of these have been conducted with married adolescents because premarital sex and pregnancy are socially and culturally unacceptable in this country. When experienced, it is usually kept confidential and most women prefer to undergo an unregistered abortion. There are no records of pregnancies in unmarried adolescents in Turkey. Thus, this study was carried out only in married adolescents.

Denizli is a province in western Turkey with a population of 284,000 and with a concentration of textile factories. The western region is the most densely settled, the most industrialized, and the most socioeconomically advanced region in Turkey. The educational level of Denizli inhabitants is higher and the unemployment ratio lower than the mean for the whole country (Republic of Turkey, Prime Ministry, 2005). However, families with low socioeconomic level who are not able to send their daughters to school generally send them to work in the textile factories until they are married. The aim of this study was to determine the degree to which socioeconomic status is a risk factor for first birth at age 19 or younger married women in the central district of Denizli.

Methods

Denizli is located in the Aegean region in western Turkey. Health services are provided by the Denizli Directorate of Health, Ministry of Health. There are 26 primary health care centres in the central district of Denizli.

Midwives in the primary health care centres give preventive health services such as the follow-up of pregnant women, infants and 0- to 5-year-old children, vaccination and health education. A follow-up record is kept for each pregnant woman, which includes all information about the pregnancy.

This research was planned as a population-based case-control study and was carried out in all 26 primary health centres located in the central district of Denizli between December 2003 and April 2004. In the first part of the study, all adolescent pregnant women were determined from the follow-up records kept in the primary health care centres during December 2003. The study group comprised all married and pregnant women aged 15–19 attending the primary health care centres in Denizli throughout the duration of the study (144 subjects). Married women between 20 and 29 years of age, experiencing their first pregnancy (adult pregnancy), were determined as the control group (144 subjects). Adult pregnant women were selected from the same region that the midwife reported an adolescent pregnant woman.

The researcher completed the questionnaire (including open- and closed-end questions) in face-to-face interviews lasting approximately 20 minutes. The questionnaires of working women were completed by the responsible midwife (13% of all questionnaires). Both groups were surveyed using the same questionnaire.

The ethical committee of the Pamukkale University Faculty of Medicine and Denizli Directorate of Health approved the study protocol.

Variables

The dependent variable is *adolescent pregnancy*. The independent variables are:

- *family members living in the same house prior to marriage* (family structure)
- *communication with parents*
- *education status* of woman, husband and parents. The education status of the pregnant women and their husbands was divided into two categories: those with a secondary school education or lower and those with a high school education or higher. The education status of the parents was divided into three categories: uneducated, primary school graduate and secondary school graduate and higher. Five years of primary school education was mandatory in Turkey until 1999 and this increased to 8 years from 1999 and does not include all pregnant patients in this study
- *adolescent marriage and pregnancy within the family* (mother, sister and relatives) or *friends*
- *exposure to pre-marital violence*
- *attitude of family towards adolescent marriage and adolescent pregnancy*
- *age at marriage*
- *husband's age*
- *social class* based on the employment status of the woman, her husband and parents. Subjects having a private job: 1, employed; 2, high-quality independent;

3, working for self. Salaries: 1, highly paid; 2, white collar worker; 3, non-qualified service provider; 4, blue collar worker. Unemployed included housewives and students

- *income* calculated by dividing the total monthly income (in US\$) by the number of family members
- *ownership of house*
- *number of individuals in the house*
- *number of individuals per room*
- *receiving social security*

Analysis

Data were analysed using SPSS version 10.0 by chi-squared analysis, *t* test and logistic regression analysis as appropriate. The *t* test was used to compare the mean age at marriage, mean age of husbands and mean number of family members living in the same house for adolescent and adult pregnant women. Both bivariate and multiple logistic regression analyses were used to determine the risk factors of adolescent pregnancy. The bivariate analysis used the chi-squared test to yield relative risks with 95% confidence intervals. Risk factors significantly affecting adolescent pregnancy were tested with a Backward logistic regression analysis and independent risk factors were identified.

Results

The mean age of adolescent pregnant women (case group, 15–19 years) enrolled in the study was 17.98 ± 0.96 and that of adult adolescent women (control group, 21–29 years) was 22.9 ± 2.2 . The mean age at marriage was 17.0 ± 1.1 years among adolescents and 21.9 ± 2.1 years among adults ($p < 0.001$). The mean age of husbands was 24.3 ± 2.8 years among adolescents and 26.4 ± 3.2 years among adults ($p < 0.001$). The percentage of adolescent pregnant women who were not officially married was 9.7% (fourteen subjects). All adult pregnant women were officially married.

A statistically significant difference was detected between adult and adolescent pregnant women with regard to their education level, their husband's education level, employment status and their father's social class ($p < 0.05$) (see Table 1). Adolescent pregnancy risk was 2.31 times higher among unemployed women than in employed ones (blue collared, unqualified service provider, white collar salaried, working for self). A significant difference was present between the case and control groups in terms of monthly salary per person, the number of individuals living in the house per room and social security ($p < 0.05$). The risk of adolescent pregnancy among women without social security was 3.71 times higher than in those with social security (see Table 2).

The risk of adolescent marriage is two times higher among adolescents living in core families than those living in extended families. A highly statistically significant difference is apparent between cases and controls in terms of attitudes of families towards marriage at an early age ($p < 0.001$). Opposition to early pregnancy is significantly higher in families of pregnant adolescents than in families of adult pregnant women (see Table 3).

Table 1. Comparison of pregnant adolescents and adults with regard to education status, employment and social status

Variable	Case		Control		OR	95% CI
	<i>n</i>	%	<i>n</i>	%		
Education status of pregnant adolescents						
Secondary school and lower	129	89.6	93	64.6	4.72	2.50–8.89
High school and higher	15	10.4	51	35.4	1.00	
Education status of husbands						
Secondary school and lower	101	70.1	76	52.8	2.10	1.29–3.41
High school and higher	43	29.9	68	47.2	1.00	
Education status of mothers						
Illiterate	38	26.4	39	27.1	0.97	0.33–2.86
Primary school	98	68.0	97	67.0	1.01	0.36–2.80
Secondary school and higher	8	5.6	8	5.6	1.00	
Education status of fathers						
Illiterate	12	8.3	13	9.0	1.04	0.39–2.73
Primary school	109	75.7	105	72.9	1.17	0.63–2.18
Secondary school and higher	23	16.0	26	18.1	1.00	
Employment status of pregnant adolescents						
Unemployed	121	84.0	100	69.4	2.31	1.31–4.09
Employed	23	16.0	44	30.6	1.00	
Employment status of husbands						
Monthly or otherwise salaried/unemployed	113	78.5	115	79.9	0.92	0.52–1.62
Has a private business	31	21.5	29	20.1	1.00	
Employment status of mother						
Unemployed	122	84.7	124	86.1	0.89	0.46–1.72
Employed	22	15.3	20	13.9	1.00	
Employment status of father						
Monthly or otherwise salaried/unemployed	82	56.9	69	47.9	1.43	0.90–2.28
Has a private business	62	43.1	75	52.1	1.00	
Total	144	100.0	144	100.0		

The risk of adolescent pregnancy was 1.82 times higher among women who had sisters who had an adolescent marriage and 2.55 times higher among women who had adolescent pregnant sisters than those who did not ($p < 0.05$) (see Table 4).

The factors identified in the bivariate analysis as significantly associated with pregnancy were incorporated into a multivariate logistic regression analysis. The results of this analysis are shown in Table 5.

Discussion

Research conducted in adolescents in Turkey in 2001 found that 6.4% of 15- to 19-year-olds were married, 4.9% had been pregnant as an adolescent and 4.8% had delivered a baby (Özşahin *et al.*, 2006). A comparison of the fertility rate with the

Table 2. Comparison of socioeconomic features of pregnant adolescents and adults

Variable	Case		Control		OR	95% CI
	<i>n</i>	%	<i>n</i>	%		
Mean monthly income per person (US\$)						
<100	36	25.0	17	11.8	4.68	1.99–11.0
100–199.9	77	53.5	68	47.3	2.51	1.23–5.10
200–299.9	17	11.8	28	19.4	1.34	0.56–3.22
300 or higher	14	9.7	31	21.5	1.00	
Number of persons per room						
>1	38	26.4	11	7.6	4.33	2.11–8.89
0–1	106	73.6	133	92.4	1.00	
Ownership of house						
Do own	80	55.6	90	62.5	0.75	0.46–1.20
Do not own	64	44.4	54	37.5	1.00	
Receive social security						
No	52	36.1	19	13.2	3.71	2.06–6.71
Yes	92	63.9	125	86.8	1.00	
Total	144	100.0	144	100.0		

2003 TDHS results, and Denizli with the results from the western provinces, shows that Denizli has a lower fertility rate than both Turkey's western region and the mean of city centres, but it is higher than in many other countries: for example Japan and Western European countries (Trent, 1990; Singh & Samara, 1996; Singh, 1998; Maticka-Tyndale *et al.*, 2000). Denizli has a lower adolescent birth rate than Iran, Egypt, Libya and Saudi Arabia but a higher rate than Syria and Iraq (the rate per 1000 females aged 15–19 years was 44 in Syria, 45 in Iraq, 77 in Iran, 62 in Egypt, 102 in Libya and 114 in Saudi Arabia) (Singh, 1998). Although Denizli is one of the most industrially developed provinces in Turkey, with low unemployment and good education and health indicators, it is significant that it also has a high rate of adolescent pregnancy (Republic of Turkey, Prime Ministry, 2005). Apart from the TDHS data, little is known about the situation in eastern Turkey. Indeed, very little research has been conducted on adolescent pregnancy in Turkey, and no research has been reported in the literature on the risk factors for adolescent pregnancy (Ozcebe & Dervisoglu, 1993; Ozcebe, 1998). For this reason these data are very valuable for the understanding of the situation in Turkey.

The results of the study are discussed in two sections: socioeconomic status and findings related to the family. For women of families with a low socioeconomic status, adolescent pregnancy was more frequent among those living in extended families, not living with either parent and those subjected to violence prior to marriage. The main determinants of socioeconomic status were occupation (class) and income; both were associated with adolescent pregnancy.

The education status of the pregnant adolescent and her husband were found to be risk factors for adolescent pregnancy; however, the education status of parents did

Table 3. Family type, family relations and attitude of families toward adolescent marriage and adolescent pregnancy in pregnant adolescents

Variable	Case		Control		OR	95% CI
	n	%	n	%		
Family type						
Core	120	83.3	131	91.0	2.01	0.98–4.13
Extended	24	16.7	13	9.0	1.00	
Living with parents						
Both parents	120	83.3	131	91.0	1.00	
Only mother	14	9.7	9	6.3	1.69	0.70–4.06
Only father	5	3.5	—	—	—	
None	5	3.5	4	2.7	1.36	0.35–5.20
Relationship with mother ^a						
Very good	34	24.6	30	21.3	1.00	
Good	88	63.8	97	68.8	0.80	0.45–1.41
Bad	16	11.6	14	9.9	1.00	0.42–2.40
Relationship with father ^a						
Very good	29	22.0	35	25.9	1.00	
Good	75	56.8	77	57.0	1.17	0.65–2.11
Bad	28	21.2	23	17.0	1.46	0.70–3.07
Exposure to violence by family members						
Yes	29	20.1	9	6.3	3.78	1.72–8.31
No	115	79.9	135	93.8	1.00	
Attitude of family towards adolescent marriage						
Opposed	34	23.6	76	52.8	1.00	
Partially opposed	44	30.6	43	29.9	2.28	1.27–4.09
Not opposed	66	45.8	25	17.4	5.90	3.19–10.89
Attitude of family towards adolescent pregnancy						
Opposed	27	18.8	54	37.5	1.00	
Partially opposed	54	37.5	66	45.8	1.63	0.91–2.93
Not opposed	63	43.8	24	16.7	5.25	2.71–10.14
Total	144	100.0	144	100.0		

^aSome pregnant adolescents did not answer this question.

not have any influence on adolescent pregnancy. Many studies investigating the risk factors for adolescent pregnancy suggest that the frequency of adolescent pregnancy decreases as the education status of the husband/partner increases (Trent, 1990; Wang & Chou, 1999; Olausson *et al.*, 2001; Zavodny, 2001; Shrestha, 2002; Sharma *et al.*, 2002, 2003; Mehra & Agrawal, 2004; Adhikari, 2005; WHO, 2005).

The rate of continued education after primary school (5 years) in Turkey is 41.6% among girls and 55.0% among boys and the rate of going on to high school or higher is 14.8% among girls and 21.0% among boys. The median duration of school is 7.4 years for girls and 8 years for boys (TDHS, 2004). Although there is discrimination between boys and girls in terms of schooling, the duration of training

Table 4. Adolescent marriage and pregnancy among mothers, sisters, friends and relatives of pregnant adolescents

Variable	Case		Control		OR	95% CI
	n	%	n	%		
Mother had adolescent marriage (yes)	103	71.5	99	68.8	1.14	0.68–1.89
Mother had adolescent pregnancy (yes)	82	56.9	74	51.4	1.25	0.78–1.99
Sister had adolescent marriage (yes)	57	39.6	38	26.4	1.82	1.11–3.01
Sister had adolescent pregnancy (yes)	42	29.2	20	13.9	2.55	1.41–4.62
Adolescent marriage among friends (yes)	93	64.6	70	48.6	1.93	1.20–3.09
Adolescent pregnancy among friends (yes)	59	41.0	56	38.9	1.09	0.68–1.74
Adolescent marriage among relatives (yes)	79	54.9	58	40.3	1.80	1.13–2.88
Adolescent pregnancy among relatives (yes)	63	43.8	42	29.2	1.89	1.16–3.07
Total	144	100.0	144	100.0		

Table 5. Predictors of adolescent pregnancy (dependent variable) according to logistic regression analysis

Variable	OR	95% CI
Violence prior to marriage (subject to violence)	4.37	1.79–10.65
Attitude of family towards adolescent marriage (partially opposed and not opposed)	3.08	1.71–5.54
Education status of the adolescent (secondary school or lower)	2.94	1.46–5.93
Social security (no)	2.64	1.33–5.25
Number of persons per room (>1)	2.47	1.10–5.54
Employment status (unemployed)	2.01	1.03–3.94
Sister had adolescent pregnancy (yes)	1.85	0.94–3.63

is still low among boys. The main problem is that families with a low socioeconomic status pursue employment for their sons and prefer to have their daughters married when they are unable to have their children continue school (TDHS, 2004). These under-educated children either become unemployed in a short time or work for a very low salary in an unqualified job. Ultimately, they also form indigent families who cannot offer education opportunities to their children and this vicious cycle goes on. The correlation of adolescent pregnancy with socioeconomic status has also been shown in other studies (Trent, 1990; Guijarro *et al.*, 1999; Olausson *et al.*, 2001; Sharm, *et al.*, 2002; Shrestha, 2002; Rani & Lule, 2004).

This study has revealed that unemployment of an adolescent is a risk factor for adolescent pregnancy and that monthly income is low in pregnant adolescents. The frequency of adolescent pregnancy is higher among unemployed individuals (housewives, students) than among employed ones (blue collar workers, unqualified service

workers, white collar salaried workers, highly qualified salaried workers, those working for themselves). A study by Trent (1990) including data from 50 developing countries demonstrates that higher levels of development and higher rates of women's labour force participation are related to lower fertility rates. In a study in Sweden, a comparison was made between adolescent mothers and mothers aged 20–24 with regard to social outcomes in later life. The results of this study suggest that those 'who first give birth as teenagers are at increased risk of socioeconomic disadvantage in adulthood in terms of employment, living arrangements, parity and dependence on social welfare' (Olausson *et al.*, 2001). Another finding in the same study is that adolescent mothers will either be unemployed or blue collar workers – a finding consistent with our results.

Furthermore, possession of a house, the number of persons per room, the mean number of persons living in the house, and receiving social security were other determinants of socioeconomic status, and correlation of these variables with adolescent pregnancy was assessed. Social security status and the number of persons per room were found to be risk factors for adolescent pregnancy. In Turkey, individuals without social security are either unemployed or work in temporary unqualified jobs. A high number of persons per room indicates that these women live in poor condition in small houses.

The frequency of adolescent pregnancy was higher among girls living in extended families, in those not living with either parent and in those exposed to violence prior to marriage. Another study showed that family size is greater among families of pregnant adolescents (Guijarro *et al.*, 1999). The risk of adolescent pregnancy among adolescents who did not live with their parents was also found to be higher in a study by Wang & Chou (1999).

Adolescent pregnancy was found to be higher among girls exposed to violence within the family prior to marriage. Research indicates that the frequency of domestic violence increases as socioeconomic status decreases and inequality increases (Bates *et al.*, 2004; Wilkinson, 2005). A background of poor socioeconomic conditions, poor relations with the father prior to marriage, exposure to violence prior to marriage, and a negative attitude of the family toward early marriage may have driven the adolescent to early marriage and early pregnancy.

The risk of adolescent pregnancy is high among girls who have sisters with a history of adolescent pregnancy. A study in Taiwan reported a high frequency of adolescent pregnancy among girls who had friends or relatives with a history of adolescent pregnancy (Wang & Chou, 1999). This may be attributed to two factors. First, considering the fact that an adolescent from a family with poor socioeconomic conditions would live in a similar environment, it is not surprising to find that a sister, a friend or a relative has a history of adolescent pregnancy. Secondly, the adolescent may have followed in the footsteps of a sister as an example. A study by East (1996) demonstrated that sisters of adolescent mothers had a greater tendency for adolescent pregnancy due to influence by their siblings.

In conclusion, the direct and indirect effects of socioeconomic status are risk factors for adolescent pregnancy. Adolescent pregnancies, like infant deaths, should be considered a reflection of the socioeconomic development status of a country. The solution to this problem lies in the general improvement/development of the country.

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