

Utilization of prenatal care in poorer and wealthier urban neighbourhoods in Turkey

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Background: The objectives of this study are to identify the individual- and neighbourhood-level determinants of utilization of prenatal care, and to identify self-reported reasons for not receiving prenatal care in Turkey. **Methods:** A household-based cluster sample of 1249 women who had a child less than two years old were interviewed in five Turkish cities. Multilevel regression analysis was run to predict the influences of individual- and neighbourhood-level characteristics on utilization of prenatal care. **Results:** Utilization of prenatal care and the quality of the care received were found to be significantly lower in poorer neighbourhoods. Using multilevel regression analysis (two levels), educational level, income, parity and having health insurance were found to be individual-level determinants, while quality of care offered and stability of the local population were found to be neighbourhood-level determinants of utilization of prenatal care. The most frequent self-reported reason for receiving no prenatal care was 'not having any complaint', and the second was 'insufficient financial resources'. **Conclusion:** There was a big difference between poor and wealthy neighbourhoods in utilization of prenatal care. This difference was partly due to a contextual effect of neighbourhood status; but mostly due to individual-level variables. Improving the quality of prenatal care may increase not only the benefits of prenatal care, but also its utilization, especially in the public sector. Health and social policies have to take into account diversity among individuals and neighbourhoods in the course of efforts to improve service quality.

Keywords: prenatal care, socio-economic factors, Turkey, urban health services

Prenatal care is a central component of maternity care, which is accepted as beneficial to maternal and child health. Globally, over 500,000 women die each year due to pregnancy-related complications and nearly all of those deaths occur in developing countries.^{1,2} For each woman who dies, at least 30 to 100 women survive childbearing but suffer from serious disease, disability, or physical damage.² Providing adequate prenatal care may prevent immediate causes of pregnancy-related complications,^{3–6} and promote healthy behaviour including postpartum contraceptive use⁵ and infant care.⁷

Coverage of prenatal care is defined here as percentage of women who received care at least once during pregnancy by a skilled health worker for reasons related to pregnancy.¹ The mean coverage rate of prenatal care is about 67% in developing countries and 97% in developed countries.¹

Quality of prenatal care is another issue. Accepted indicators of quality prenatal care include early initiation, number of visits, and medical and educational content of the visits.^{6,8,9} Medical examinations are beneficial for early detection of risk factors, while the benefits of over-using medical technology may be limited.^{8,11} Health advice to pregnant women,^{5,7,10} and counselling

including psycho-social support^{3,6,12,13} are beneficial to promote the overall health of women and infants.

In many settings, utilization of prenatal care by women has been found to be strongly related to socio-economic variables. Mothers with low education,^{6,12,14,15} low income,^{6,14,16} high parity,^{12,17} no health insurance,^{14,17} no marriage,^{12,18} low social and family support,^{19,20} unintended pregnancy,^{12,21} and socially disadvantaged race and ethnicity^{12,14,22,23} have higher risk for receiving inadequate or no prenatal care. The mechanism of how socio-economic factors are related to utilization of prenatal care is less clear. Researchers use different models for explaining the mechanism; focusing on barriers and disadvantages,^{6,20} costs and rewards,¹⁹ or perceptions and behaviours.²⁴ In any case, economically poor and socially disadvantaged women have a higher risk for receiving inadequate or no prenatal care.

Analysis of Turkey Demographic and Health Survey (TDHS) 1998 results showed that the region, education level, number of children, health insurance availability, ethnicity, and household wealth are the socio-economic determinants of receiving or not receiving prenatal care in Turkey.^{16,25} Ethnicity was not found to be a determinant in another study based on TDHS 1993 results.²⁶

Socio-economic variation within the urban population is closely related to health status in general.^{27,28} People with lower and higher socio-economic status live mostly in separate neighbourhoods. The diversity between neighbourhoods is particularly important for planning health

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and social services.^{29–31} Rapid urbanization, high rates of population movement, and poverty cause community health problems in urban areas of Turkey.^{32,33} Lack of proper housing, clean water, sewerage and low coverage of health insurance are some of the problems which are concentrated in poorer neighbourhoods. Additionally, neighbourhood-level factors may have a contextual effect on individual health status.³⁴ Considering the contextual effect is important in understanding the mechanism between socio-economic conditions and health status.

In Turkey, primary health care services are offered by the government for free or with a very low charge. Health services are widely available and the number of health personnel is sufficient in urban areas. However, the health system is not well organized, the quality of services is often low, and governmental primary health care services are weak.^{35,36} The national coverage rate of health insurance is 69%.³⁵ Distance to health centres is an access barrier in rural areas. In the last 10 years private clinics have also become a very important source of health services in the cities. Despite the high availability and accessibility of services, the coverage rate of prenatal care was only 77.6% in urban areas, according to 1998 TDSH and most women do not receive adequate prenatal care.^{25,37}

In this context, this article aims to define the differences in utilization of prenatal care between poor and wealthy neighbourhoods, to examine if there is an effect of neighbourhood context, and to identify the self-reported reasons for receiving no prenatal care among women who have no prenatal visit, in the urban population in relatively developed provinces of Turkey.

METHODS

Sampling

The sample consisted of 1249 women who have a child less than two years old, living in urban neighbourhoods of five cities; Istanbul (Maltepe District), Manisa, Tekirdag (Çorlu District), Konya and Zonguldak. These cities are all relatively developed cities according to Gross Domestic Product Per Capita, situated in the western and central regions of Turkey, and receiving internal migration from less-developed cities of eastern Turkey.

A household-based multi-stage sampling design was used to select the respondents. First, neighbourhoods were classified as relatively poorer or wealthier in each city. Because of the absence of detailed information on socio-economic status of neighbourhoods, classification of neighbourhoods as relatively poorer or wealthier was based on information given by local health personnel. Health educators, nurses and physicians working in those districts were asked to classify the neighbourhoods on the map as poorer or wealthier. If a particular neighbourhood was classified in different categories by different informants, those neighbourhoods were excluded from the sample.

To determine the sample size, maximum probable prevalence of receiving no prenatal care was estimated around 15% in poorer neighbourhoods and 5% in wealthier neighbourhoods by using 1998 TDHS data.²⁵

The smallest sample size for each category of neighbourhoods was 277 and this number was multiplied by two to adjust for design effect caused by cluster sampling.³⁸ Thus, the minimum sample size was calculated at 554 for poor and 554 for wealthy neighbourhoods for a total of 1108 women. The actual sample size was set at 1250 for the study. Sample size was 250 for Manisa, Tekirdag, Konya and Zonguldak, and 500 for Istanbul.

Streets in the neighbourhoods were selected randomly, as cluster units. Fifteen houses from each street were selected systematically; and six interviewers (one for each city, and two for Istanbul) visited women at home. Women were given information about the study and were asked to give their verbal consent for participation in the interview. Women who agreed to participate in the interview were not subject to any other procedures. Response rates in the neighbourhoods were between 98.4 and 99.6% and thus were not likely to have an influence on the results. The sample was considered to be representative at the neighbourhood-level, but not representative at the city or country level due to exclusion of rural areas and the methods used to select the neighbourhoods and cities.

Data collection and analysis

Face-to-face interviews were conducted using a questionnaire consisting of closed-ended questions on general characteristics of women, and patterns of prenatal visits. Content of care was evaluated by receipt of laboratory or ultrasound examinations, and health advice. Because the women might under-report the details of laboratory examinations, they were asked whether any blood or urine samples were taken. Women who received at least one of these examinations were classified as 'received any blood or urine laboratory examination'.

Women were asked whether they received health advice on different topics such as nutrition in pregnancy and contraception after delivery. Detailed questions were asked for each topic, and women who received any advice on a particular topic, were classified as 'received advice' on that topic.

Patterns of utilization of care were evaluated by bivariate comparisons. Among women who received no prenatal care, frequency distributions of self-reported reasons were evaluated.

Logistic regression analysis was used to estimate various models for receiving at least one prenatal care visit, and for users, receiving at least four prenatal visits. Twenty-one cases were excluded from the regression analysis because of missing data. Individual-level variables were analysed by single-level logistic regression, then, individual-level and neighbourhood-level variables were analysed by multilevel analysis (two levels). HLM 5.04 (Hierarchical Linear and Non-linear Modelling) software was used for multilevel analysis, and final estimation of fixed effects (population-average model) was used to estimate the model. Variables found statistically significant in bivariate comparisons and single-level logistic regression analyses were examined in various multilevel models.

Input variables at the individual-level were educational level, age, number of children, health insurance availability, employment status of mother, and household income per capita. Neighbourhood-level variables were obtained by aggregation of individual-level data to neighbourhood-level information. Thus, stability of the population was calculated as the average years of residence; household size was the average household size; income level was the average income per capita; and the quality of service was defined as the proportion of mothers who received at least one urine or blood laboratory examination, and some health advice during the last pregnancy.

RESULTS

In the first step of the analysis, coverage rates of prenatal care were compared according to socio-economic variables (table 1). Coverage rate was found significantly related to income, education, insurance, employment, parity, age, and neighbourhood status by bivariate comparisons.

Prenatal experiences of women in poorer and wealthier neighbourhoods were also examined by bivariate comparisons (table 2). These comparisons regarding patterns of prenatal care showed that not only the coverage of prenatal care but also the number and quality of prenatal

visits were significantly lower among women in poorer neighbourhoods.

In the second step, self-reported reasons for receiving no prenatal care, and the influence of individual- and neighbourhood-level variables were analysed (table 3). The primary reason for not receiving prenatal care was to believe that it was unnecessary. Insufficiency of financial resources was a secondary, but still considerable reason.

Influences of various variables on utilization of care were analysed by single-level and multilevel analysis. Results of both single-level and multilevel analysis were consistent, regarding individual-level variables. Women with lower education, lower income and high parity were at significantly higher risk of receiving no prenatal care. Having health insurance was not related to receiving any prenatal care; but women without insurance were more likely to receive less than four prenatal visits (table 4, table 5).

Neighbourhood-level variables were examined by multilevel analysis. Neighbourhoods in which women received better quality prenatal care services and average household size was smaller were more likely to have higher utilization rates (table 5). Quality of services was significantly better in private clinics than in public clinics. The risk for not having any laboratory examination or

Table 1 Coverage of prenatal care by mothers' characteristics in poorer and wealthier neighbourhoods

Characteristics of mothers	Poorer neighbourhoods			Wealthier neighbourhoods			Total			p
	All women n	Coverage n	%	All women n	Coverage n	%	All women n	Coverage n	%	
Years of education										
<5	84	56	66.7	11	9	81.8	95	65	68.4	<0.001
5-10	452	411	90.9	289	269	93.1	741	680	91.8	
≥11	89	85	95.5	323	323	100	412	408	99.0	
Household income per capita (monthly)										
<100 \$	434	368	84.8	194	175	90.2	628	543	86.5	<0.001
≥100 \$	188	181	96.3	417	414	99.3	605	595	98.3	
Health insurance										
None	263	226	85.9	142	130	91.5	405	356	87.9	<0.001
Some	360	324	90.0	478	469	98.1	838	793	94.6	
Mother is employed										
No	606	534	88.1	493	473	95.9	1099	1007	91.6	<0.01
Yes	19	18	94.7	130	129	99.2	149	147	98.7	
Number of children										
1	247	236	95.5	269	262	97.4	516	498	96.5	<0.001
2-3	323	276	85.4	336	325	96.7	659	601	91.2	
≥4	55	40	72.7	19	15	78.9	74	55	74.3	
Age during birth										
13-24	289	261	90.3	175	167	95.4	464	428	92.2	<0.001
25-34	284	251	88.4	383	370	96.6	667	621	93.1	
35-51	52	40	76.9	65	64	98.5	117	104	88.9	
Place of last delivery										
Home	76	57	75.0	18	14	77.8	94	71	75.5	<0.001
Health facility	549	495	90.2	606	588	97.0	1155	1083	93.8	
All women	625	552	88.3	624	602	96.5	1249	1154	92.4	

health advice, was 3.55 times higher in public clinics than in private clinics (95% CI: 2.75–4.58). No significant interaction was found between the different level variables.

Average income per capita was found as a determinant in both individual- and neighbourhood-levels; but the coefficient value of income per capita as an individual-level variable was higher, and the relationship was more significant. Because income level of the neighbourhood was derived from individual-level data; this variable was used only at the individual-level in the final model presented in *table 5*.

DISCUSSION

The results indicate that diversity between individuals and neighbourhoods is very high. Some subgroups of our sample have similar rates to those of developed countries, while some others are similar to the poorest countries of the world. Quality of prenatal care was also significantly lower in poorer neighbourhoods. This diversity reflects the gap between communities and subgroups of the population, which may have negative impacts on health outcomes.

The TDHS is the main source of information on maternal and child health, and obtains area level data on regional and urban / rural comparisons. According to these comparisons, various indicators of health status are lower in rural areas. On the other hand, patterns of utilization of prenatal care and its contributing socio-economic factors are not homogeneously distributed in urban settlements.^{30,33} Socio-economic differences in an urban population may put the people at higher risk than in rural areas, because of the higher levels of poverty, unemployment and socio-cultural distress in cities.^{39,40} According to the neighbourhood-level comparisons in this study, it is likely that there is considerable variation in prenatal experiences underlying the average figures for urban areas.

Adequate health service planning at the neighbourhood-level is important to improve maternal health, which has a high priority in Turkey. Proper and accessible primary health care services should be established in poorer neighbourhoods of urban areas. Programmes of health education and promotion should be implemented and social services should be better organized in these areas. To the contrary, in recent decades primary health care services have been dramatically weakened in general and particularly in urban areas of Turkey. Furthermore, privatization of health services is still in progress; and private clinics chose to serve populations with relatively higher socio-economic status. So, poorer people receive less preventive service, whereas they need more.

Home delivery is not considered as an 'unhealthy' condition by itself. However, home delivery may put the mother and baby at risk even if she was attended by a skilled health worker, when the mother has received no prenatal care. Among women in our study, 7.5% (n=94) delivered their last babies at home. Around a quarter of

Table 3 Percentage distribution of self-reported reasons for women not receiving prenatal care

Reasons for not receiving prenatal care	Frequency n=95	
	n	%
Didn't have any complaint	55	57.9
Insufficient financial resources	41	43.2
Believes prenatal care is not necessary	25	26.3
Doesn't want to go to male doctors	14	14.7
Health facility is too far	9	9.5
Behaviour of health personnel is negative	8	8.4
Fear	8	8.4
Doesn't know it may be necessary	6	6.3
Husband / older family members don't permit	2	2.1
Doesn't trust health institutions	1	1.1

Table 2 Number and content of prenatal care in poorer and wealthier neighbourhoods

Number and content of prenatal visits	Poor neighbourhood		Wealthy neighbourhood		p
	n	%	n	%	
Number of prenatal visits ^a					
0	73	11.7	22	3.5	<0.001
1–3	153	24.5	62	10.0	
≥4	398	63.8	536	86.5	
Services received by women ^b					
Any laboratory or ultrasound examination	401	72.6	499	82.9	<0.001
At least one dose of tetanus toxoid	345	62.6	356	59.3	>0.05
Information about tetanus toxoid	215	39.1	291	48.7	<0.01
Advice on					
Pregnancy nutrition	279	50.5	401	66.6	<0.001
Birth preparedness	231	41.9	375	62.3	<0.001
Contraception after birth	161	29.2	268	44.5	<0.001
Breast feeding	277	50.2	362	60.2	<0.01
Postnatal care	121	21.9	247	41.2	<0.001
Infant care	280	50.7	360	59.8	<0.01

a: Among all women; n=1244

b: Among women who have at least one visit; n=1154

these had no prenatal care at all, and most of those births were in poorer neighbourhoods. Combination of high rate of home deliveries for Turkey (18.9%),²⁵ and low coverage of prenatal care appears as a particular health matter in Turkey.

Self-reported reasons for not receiving prenatal care may give us some insight into the patterns of prenatal service use. The most frequent reason was 'not having any complaint', and similarly, the third frequent answer was the belief that prenatal care was unnecessary. Those answers suggest that the leading reason for not receiving prenatal care is not a 'barrier'. Women do not try to 'access' health service, because they don't think that they should receive it, unless they have some complaint. Qualitative research may help to understand the perceptions of women on this issue.

The second most frequent reason, however, was insufficient financial resources. Income level of household may affect behaviour directly by enabling or disabling health service use, or may affect particularly the medical content of care received. In most cases, women who have lower income level have also lower educational level, higher number of children and no health insurance, etc. So, multiple disadvantageous conditions may occur frequently. We may suggest that, those women who reported 'insufficient financial resources' as a reason for not receiving prenatal care may experience multiple socio-economic disadvantages.

Other self-reported reasons were cultural or health service related barriers, such as gender or behaviour of health personnel. Although those were relatively less frequent

Table 4 Mothers' characteristics as predictors of prenatal service use by single-level regression analysis

Individual-level variables ^b	Effects of variables on receiving no prenatal care				Effects of variables on receiving less than four visits ^a			
	(B)	SE	Estimated OR (95% CI)	p	(B)	SE	Estimated OR (95% CI)	p
Education level by years								
<5	2.61	0.58	13.56 (4.37–42.11)	0.001	1.52	0.34	4.57 (2.34–8.97)	0.001
5–10	1.36	0.54	3.91 (1.36–11.19)	0.01	0.99	0.22	2.70(1.74–4.19)	0.001
≥11			1				1	
Household income per capita								
<100 US\$	1.72	0.37	5.55 (2.67–11.55)	0.001	0.53	0.18	1.70 (1.19–2.41)	0.003
≥100 \$			1				1	
Number of children								
1			1				1	
2–3	0.91	0.29	2.47 (1.41–4.35)	0.002	0.26	0.17	1.30 (0.93–1.81)	0.13
≥4	1.25	0.39	3.48 (1.64–7.42)	0.001	1.04	0.32	2.83 (1.52–5.27)	0.001
Health insurance								
Some							1	
None			Not included in the equation		0.17	0.42	1.53 (1.10–2.12)	0.01

OR: odds ratio; 95% CI: 95% confidence interval

a: Among women who received at least one prenatal visit.

b: Age, household size, years of residence in the city, and employment status of the mothers were not found significant in both models.

Table 5 Neighbourhood and individual-level characteristics as predictors of prenatal care by two level regression analysis^a

Variables ^b	Effects of variables on receiving no prenatal care				Effects of variables on receiving less than four visits			
	(B)	SE	t-ratio	p	(B)	SE	t-ratio	p
Individual-level variables								
Educational level	-1.20	0.24	-4.94	0.001	-0.73	0.17	-4.30	0.001
Household income per capita	-1.68	0.37	-4.49	0.001	-0.67	0.15	-4.58	0.001
Number of children	0.66	0.18	3.63	0.001	0.39	0.13	2.92	0.004
Health insurance	-0.32	0.24	-1.35	0.18	-0.52	0.17	-3.05	0.003
Neighbourhood-level variables								
Intercept	2.54	1.25	2.02	0.04	3.35	0.82	4.08	0.001
Service quality	-1.63	0.83	-1.95	0.05	-2.05	0.49	-4.20	0.001
Stability of the population ^c	0.10	0.05	2.13	0.03	0.08	0.02	3.65	0.001

a: Results of final estimation of fixed effects with the population-average model are presented.

b: Age and employment status of the mothers, average income per capita and household size of neighbourhood were not found to be significant in both models.

c: Average years of residence in the current neighbourhood.

answers, they represent the variety of perceptions and behaviours.

Using multilevel analysis, we found that women with lower education, lower income and high parity were at significantly higher risk of receiving no prenatal care. Although having health insurance was not found as a determinant of receiving or not receiving prenatal care; among users of prenatal care, it was found as a determinant of number of visits. So, we understood that women without health insurance are likely to receive at least one visit if they wish to receive it; but they are less likely to continue receiving visits.

At the neighbourhood-level, we have found a significant relationship between the general quality of services in the neighbourhood and the utilization of prenatal care. This result is particularly important, because number and distribution of service points and health personnel are assumed to be the most important issues for providing primary health care in Turkey; and the quality of these services are sometimes considered secondary. We have also found that the risk of not having any laboratory services or health advice, was 3.55 times higher for women who attended public clinics, compared to women who attended private clinics (95% CI: 2.75–4.58). Thus, the type of service (public or private) is a major predictor of service quality. We may conclude that improving the quality of prenatal care, for example providing adequate laboratory examinations and health advice, may increase not only the benefits of prenatal care, but also the utilization of it, especially in the public sector.

The other important factor influencing the utilization of prenatal care at the neighbourhood-level was the stability of the population. Using various forms of this variable in the analysis, and testing various models, stability was found to have a negative relationship to service utilization. It was a weak but statistically significant relation. This result may be due to traditional influences. Increased stability of the population in a neighbourhood may lead to increased contextual effects at the neighbourhood-level. This may be due to the effects of relatives, neighbours, regional health beliefs and behaviours, or perceptions regarding the health status of the mothers. Future research using qualitative methods should be used to explore this issue.

'The Behavioural Model of Health Service Use' which was developed by Andersen helps us to explain pathways between socio-economic structure, health services, health beliefs and neighbourhood context by portraying the multiple influences on health service use.⁴¹ The model combines the influences of perceived health status and needs, enabling resources, health care system and external environment in a dynamic process. Our findings on women's perceptions about the need for prenatal care, lack of financial (enabling) resources, relationship between utilization of prenatal care with individual-level characteristics, and neighbourhood context fit well with the behavioural model of Andersen.⁴¹ According to this model, neighbourhood context may influence utilization of health services through the health care system,

enabling resources of populations and perceived health status.

Readers should consider some limitations of the study. In addition to the representativeness mentioned at the Methods section, the main limitation of this study is that the data are based solely on women's self-reports. We did not have the opportunity to validate the information given by women with independent information from other sources. Given the fact that the woman may have obtained prenatal care 0 to 2.5 years previous to the interview, there is a risk of recall bias. In addition, further research on neighbourhood-level factors would benefit from detailed neighbourhood-level information obtained from different sources.

Regarding our findings, health and social policies should consider a series of individual- and neighbourhood-level factors to provide adequate health services for urban populations. The multidimensional nature of utilization of prenatal care indicates a multidimensional approach to improve service usage.

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