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The Cost of Prenatal Care Services in the City of Aydın: A Cross-Sectional Study

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ABSTRACT

Aim: To determine the cost of prenatal care services provided to pregnant women in the city of Aydın, Turkey.

Method: This cross-sectional study was conducted over the period of February-December 2016 at the Aydın Maternity and Children's Hospital. The convenience sampling method was used to recruit 403 women who were in weeks 36-42 of pregnancy into the study. Data for the study were collected with the Descriptive Information Form and the Prenatal Care Service Usage Form. Descriptive statistics, Mann-Whitney U and Kruskal-Wallis tests were used to analyse data.

Results: It was determined that the pregnant women were followed up an average total number of 10.94±4.30 times and 97.0% received care at the state hospital. It was found that for each pregnant woman, the mean total cost of prenatal care was $138.77±$93.44, the sum paid by general health insurance was $96.12±$46.38, individual contributions stood at $25.05±$10.43 and payments made to the private institutions was $110.32±$142.31. It was observed that the total prenatal care cost was not influenced by some of the characteristics of the pregnant women.

Conclusion: It was revealed in the study that most pregnant women received prenatal care at the state hospitals and at family health centers and that they had approximately 11 prenatal care follow-ups amounting to a total mean cost of about $139. A contribution can be made to making prenatal care more cost-effective by organizing the number and scope of prenatal care sites on the basis of the individual characteristics of risk factors pregnant women.

Keywords: Cost, follow-up, prenatal care, Turkey

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INTRODUCTION

Prenatal care is of vital importance in terms of starting a new life on a healthy path and reducing mother and infant mortality and morbidity rates. Throughout pregnancy, women are faced with many different health risks that adversely affect their health as well as the well-being of their babies. It is therefore important and necessary that all pregnant women be monitored by healthcare professionals. The World Health Organization (WHO) (2016) advises that mothers and newborns are provided with evidence-based and cost-effective care services during pregnancy and in the postpartum period.

In 2016, 1.309.771 live births were reported in Turkey (Turkish Statistical Institutes, 2017). According to the 2013 data of Turkish Population and Health Research, 97% of pregnant women in Turkey received prenatal care and 90% of these women began prenatal care before the fourth month of their pregnancy, and 89% received care four or more times. The family budget and health insurance of women is important for the care received throughout their pregnancy and significant topic both from the individual's point of view and from a national perspective.

The total number and scope of prenatal care visits is significance in terms of the sufficiency of the care provided and in the context of assessing costs. The prenatal care program recommended by the Republic of Turkey Ministry of Health for low-risk pregnancies is a check-up up every month until the 7th month of pregnancy (for the first 28 weeks), then every two weeks until the 36th week, and later, every week until the 40th week or the delivery. Accordingly, a woman needs to receive at least 10 sessions of prenatal care during her pregnancy (Akadlı-Ergöçmen, Çavlin, & Abbasoğlu-Özgören, 2014). The number of sessions may be more for pregnant women at high risk (Turkish Ministry of Health Turkish Public Health Institution Department of Women and Reproductive Health, 2014).

Prenatal care services in Turkey are provided at Family Health Centers, the state and university hospitals and at private hospitals. Additionally, pregnant women may also choose to be monitored by independent ObGyn specialists. In accordance with Republic of Turkey legislation, all pregnant women are required to be monitored by family health centers (Implementing Regulation of Family Medicine, 2013). At the same time, they may receive services at will or by referral from the public and university hospitals. A portion of the examination fees and the investigations and testing charged to pregnant women is paid for by General Health Insurance. On the other hand, pregnant women with health insurance pay in a contribution for the fees of services obtained from the public institutions and private hospitals (Turkish Social Security Institution, 2017). Furthermore, pregnant women receiving services from private hospitals working on contract with General Health Insurance also pay a share of examination fees, an amount that is higher than what they would pay public hospitals and one that varies according to the particular private hospital. Also, pregnant women being examined at private doctor's offices pay for the entire service themselves.

With the increase in the use of new technologies, healthcare costs have risen, becoming an issue for healthcare consumers, health insurers and governments alike. It is imperative that a balance is maintained between healthcare costs and the quality of the care provided (Caughey, & Burchfield, 2014). A review of studies conducted indicate that the focus of research on the relationship between prenatal care and cost has been on areas such as gestational diabetes screening (Cavassini,

Lima, Calderon, & Rudge, 2012; O'Dea, Infanti, Gillespie, Tummon, Fanous, & Glynn, 2014; Weile, Kahn, Marseille, Jensen, Damm, & Lohse, 2015), asthma management (Grzeskowiak, et al., 2014), Human Immunodeficiency Virus (HIV) and syphilis (Kahn, et al., 2014; Owusu-Edusei, et al., 2014), genetic screening (Evans, Sonek, Hallahan, & Krantz, 2015), congenital heart disease (Pinto, Nelson, Puchalski, Metz, & Smith, 2014) and myelomeningocele (Werner, et al., 2012). In this context, there is a need to know what the total cost of prenatal care services amounts to. Knowing the cost of prenatal health services to individuals, families and institutions is important in terms of service receiving and presentation. Individual contributions to health expenditures in our country are steadily increasing and this situation constitutes a significant burden on the individual and family budget. In addition, the increase in the institutional cost can negatively affect the provision of prenatal care services in terms of quality and quantity as prescribed by the Ministry of Health and WHO. On the other hand, in Turkey's western regions with high socio-economic status and a place in Aydin province, it can serve as an example for the country's western region. It is expected that the data obtained on this may make a contribution to both individuals and service-providing institutions that will be useful to the planning and presentation of prenatal care services. Based on the findings, both health service managers and individuals and families can determine the number of follow-up and places of prenatal health services in a cost-effective manner.

In this study, our purpose was to determine the cost of prenatal care services provided to pregnant women in the city of Aydın, Turkey.

Research Questions

1. What is the total cost of prenatal care services provided to pregnant women?
2. What payment is made by pregnant women's health insurance toward prenatal care services?
3. How much is the individual payment contribution that the pregnant woman and family must pay for prenatal care services?
4. How much do pregnant women pay private hospitals for prenatal care services?
5. Does the total cost of prenatal care services vary according to certain characteristics of women?

METHOD

Study Design

This cross-sectional study was conducted over the period February-December 2016 at the Aydın Maternity and Children's Hospital.

Sample

A total of 403 pregnant women in their 36th-42nd gestational weeks presenting at the hospital for prenatal care participated in the study. The convenience sampling method was used in the sampling of pregnant women. Since no other research on the cost of prenatal care services was detected in the literature, a calculation of the least number of pregnant women needed for the study sample was made based on the data of the first 50 pregnant women participating in the research. Assuming that the ANOVA and t tests would be used, the calculation was carried out with G*Power 3.1.9.2 at a power of 0.95 and α=0.05; it was found that the sample should consist of 300 participants. In the later analysis based on all the data derived from the study, the calculation made with G*Power 3.1.9.2 at power=95%, alpha=0.05, sample size: 400 and group number= 4 and 2 indicated that effect size would be 0.16 (for the t test) and 0.21 (for ANOVA). The effect size according to these results was

small (Kılıç, 2014) and it was therefore concluded that the sample size was sufficient.

Women of the age of 18 and over, in or above their 36th gestational week, who could read and write Turkish and were at least elementary school graduates, were recruited into the study. Pregnant women with psychological and physical problems were excluded from the study.

Data Collection

Data for the study were collected with the Descriptive Information Form and the Prenatal Care Service Usage Form. The Descriptive Information Form was prepared by the researchers based on the literature and contained a total of 23 questions on the women's socio-demographic such as age, education, income, health insurance, family type, history of chronic illness and medicine used, and obstetric characteristics (Beulen, Grutters, Faas, Feenstra, van Vugt, & Bekker, 2014; Cavassini, et al., 2012; Özçelik, & Karaçam, 2014). The Prenatal Care Service Usage Form too, was drawn up by the researchers (O'Dea, et al., 2014; Pinto, et al., 2014; Werner, et al., 2012). The form queried the place where the pregnant women received prenatal care, the diagnostic procedures, the testing they underwent and the payments they made for these services. There were 20 areas in the form of which all information could be recorded (including those requiring further examination). A second (reserve) form was used for the pregnant women who had more follow-ups than this number. The data collection forms were self-reporting instruments that were filled out by the pregnant women under the supervision of the second researcher. Because it is known that pregnant women receive services from different units (family health centre, state or university hospital, private hospital, doctor's office), data could not be obtained retrospectively from registration systems and individual inquiry method was applied. Data on private health expenditures were also obtained through individual inquiry.

In order to improve the comprehensibility and applicability of the data collection forms, a preliminary application was launched with 10 pregnant women who were in weeks 36-42 of their pregnancy. At the end of the application, the forms were revised after some changes were made.

A team made up of an academic project coordinator (the third author) and two academic researchers (the first and second authors) carried out the study. Data were collected while the pregnant women were in the polyclinic waiting room awaiting their appointments or during Non-stressful Testing. After the selection of the pregnant women in weeks 36-42 of their pregnancy who matched the research criteria, the women were informed about the research and invited to participate in the study. The written or verbal consent of those who agreed to participate was obtained. Later the pregnant women were provided information about the descriptive information form and the Prenatal Care Services Usage Form and asked to fill out the forms according to the prenatal care services they had received at the current follow-up visit. The pregnant women were supervised during this process and any questions they had were answered. The data collection procedure was completed in approximately 15-20 minutes.

Ethical Considerations

The Adnan Menderes University, Faculty of Medicine Ethics Committee approved the study protocol (Approval number: 2015/742). The official permission of the Republic of Turkey, Aydın Provincial Health Directorate was obtained for the collection of the research data. The women recruited into the research were informed about the study and their verbal and written consent was obtained.

Table 1. Identifying characteristics of pregnant women (n=403)	
Variables	
Mean age±SD (min-max), (n=400)	27.01±5.34 (16-43)
Educational status (n=395), n (%)	
Elementary School	135 (34.1)
Middle School	136 (34.5)
High School	77 (19.5)
University and Graduate School	47 (11.9)
Spouse's Educational status (n=393), n (%)	
Literate† and Elementary school	126 (32.1)
Middle School	117 (29.8)
High School	88 (22.4)
University and Graduate School	62 (15.8)
Civil status, (n=397), n (%)	
Officially married	378 (95.2)
Not officially married	19 (4.8)
Working status (n=400), n (%)	
Income-earning	48 (12.0)
Housewife	352 (88.0)
Spouse's income-earning status (n=398), n (%)	
Yes	363 (91.2)
No	35 (8.8)
Health insurance, (n=392), n (%)	
Yes	347 (88.5)
No	45 (11.5)
Income status (n=395), n (%)	
Income less than expenditure	121 (30.6)
Income equal to expenditure‡	274 (69.4)
Family type (n=395), n (%)	
Extended family	69 (17.3)
Nuclear family	331 (82.8)
History of any diagnosed chronic illness (n=395), n (%)	
Yes	12 (3.0)
No	389 (97.0)
Taking medicines (n=401) n (%)	
Yes	37 (9.2)
No	364 (90.8)
Planned pregnancy (n=403), n (%)	
Yes	326 (80.9)
No	72 (19.1)
Wanted pregnancy (n=403), n (%)	
Yes	400 (99.3)
No	3 (0.7)
No. of pregnancies±SD (min-max), (n=403)	2.31±1.46 (1-9)
No. of live births±SD (min-max), (n=255)	1.72±1.04 (1-7)
No. of living children±SD (min-max), (n=255)	1.71±1.03 (1-7)

SD: standard deviation. †5 of the individuals in this group were literate but without schooling. ‡One individual reporting that their income was greater than expenditure was added to the income-equal-to-expenditure group

Data Analysis

The Statistical Package for the Social Sciences Version 15 (SPSS Inc.; Chicago, IL, USA) was used in the data analysis. The socio-demographic and obstetric characteristics of the pregnant women were analyzed using descriptive statistics. The calculation of the cost of prenatal care services was made according to the pricing issued as current for December 2017 by the Republic of Turkey Social Security Administration (2017). The fees of the laboratory and diagnostic tests were obtained from the hospital where the research was conducted. The total cost of payments made by General Health Insurance and individual pregnant women was calculated for each woman according to the place they received care. The number of their follow-ups and then these individual costs as well as total costs was entered into the SPSS medium. The SPSS program was used to calculate the total cost of prenatal care services, the average cost of services procured from family health centers, public hospitals, private hospitals and other units, as well as the average cost reflected on family budgets. The average cost figures were first calculated on the

basis of Turkish Lira (TRY) and then converted to dollars at the 2016 average dollar exchange rate ($1=TRY 3.532 TRY) (Turkey Department of Budget and Financial Control, 2017). The distribution of these calculated averages by institutions, General Health Insurance and the cost to the individual was analyzed with the Mann-Whitney U and Kruskal-Wallis tests since the data did not display normal distribution. Mann-Whitney U and Kruskal-Wallis tests were also used to analyze the distribution of prenatal care cost according to some characteristics of pregnant women. Values of $p<0.05$ were considered statistically significant.

RESULTS

It was found that the mean age of the women participating in the study was 27.01±5.34 years (range: 16-43). The majority of the pregnant women were elementary school (31.1%) and middle school (34.4%) graduates, 88.0% were housewives and 11.5% did not carry health insurance. Moreover, 19.1% of the women had not planned their pregnancies, 3.0% experienced prenatal problems and 9.2% were taking medications. Data on the women's income levels, smoking status and obstetric characteristics are given in Table 1.

It was determined that the women had attended a mean total number of 10.94±4.30 (range: 2-30) pregnancy follow-ups and that most (97.0%; n=391/403) had attended a mean number of 8.28±1.97 (range: 1-11) follow-ups and received this service mostly from the state hospital. It was observed that the average total cost of prenatal care was $138.77±$93.44 (range: $27.75-$1184.60). The number of pregnancy follow-ups and their average costs can be seen in Table 2. Furthermore, the cost of prenatal care services was also examined in this study in terms of the educational level and the employment status of the pregnant women and their husbands, insurance coverage, marital status, family type, perceived income, obstetric characteristics and other similar features, but no statistically significant differences were observed (Table 3).

DISCUSSION

This study was conducted as cross-sectional research with 403 pregnant women in Aydın, Turkey to determine the cost of prenatal care services. It was found that the women were followed up an average of approximately 11 times and mostly at the state hospital, that the cost of their prenatal care was covered by general health insurance or by the individuals themselves, that the average total cost of care was about $139 and that this was not influenced by some characteristics of the pregnant women. These findings are important in terms of providing comprehensive data on the cost of prenatal care services in Turkey, particularly in the Turkey's western regions and with high socio-economic status.

Table 2. Number of prenatal care visits and costs, by healthcare facility (n=403)

Variables	Mean±SD (min-max)
Number of follow-ups	
Family Health Center (n=138/403; 34.24%)	6.46±3.21 (1-10)
State hospital (n=391/403; 97.02%)	8.28±1.97 (1-11)
Private hospital/doctor's office (n=66/403; 16.38%)	4.39±3.42 (1-20)
Total number of follow-ups (n=403)	10.94±4.30 (2-30)
Amounts of average payment by site (USD)	
Payment to private facilities (n=66)	110.32±142.31 (8.49–1002.51)
State contribution (n=403)	96.12±46.38 (18.12–513.02)
Individual contribution (n=403)	25.05±10.43 (4.53-88.90)
Total cost (n=403)	138.77±93.44 (27.75–1184.60)

SD: standard deviation

Table 3. Distribution of prenatal care cost by some characteristics of pregnant women (n=403)

Variables	Mean Rank	Chi-square/Z values	p
Educational status (n=395)	5.684	0.224	
Elementary School	210.16		
Middle School	184.63		
High School	201.92		
University and Graduate School	209.83		
Spouse's Educational status (n=393)			
Literate/Elementary school	192.2	2.628	0.453
Middle School	197.44		
High School	211.24		
University and Graduate School	182.48		
Marital status, (n=397)			
Officially married	197.98	-0.406	0.685
Not officially married	208.89		
Working status (n=400)			
Income-earning	188.49	-1.242	0.214
Housewife	214.84		
Spouse's income-earning status (n=398)			
Yes	100.36	-0.852	0.394
No	92.86		
Health insurance (n=392)			
Yes	200.77	-0.147	0.883
No	197.88		
Income status (n=395)			
Income less than expenditure	181.87	-1.802	0.072
Income equal to expenditure	204.38		
Family type (n=395)			
Extended family	185.71	-1.132	0.258
Nuclear family	202.99		
History of chronic illness (n=395)			
Yes	152.04	-1.474	0.140
No	202.00		
Taking medicines (n=401)			
Yes	188.60	-0.343	0.732
No	201.32		
Planned pregnancy (n=403)			
Yes	197.80	-1.322	0.186
No	217.37		
Wanted pregnancy (n=403)			
Yes	201.89	-0.778	0.442
No	150.17		
Number of pregnancies			
Primipara	211.44	-1.517	0.129
Multipara	193.09		
Hospitalization during pregnancy			
Yes	88.60	-1.031	0.732
No	201.32		

It has been observed that the average number of follow-ups provided to pregnant women in this study (10.94±4.30; range: 2-30), is greater than the number (at least 4 follow-ups) recommended by the WHO (2016) or Turkey's Ministry of Health (Turkish Ministry of Health Turkish Public Health Institution Department of Women and Reproductive Health, 2014). But in Turkey, a pregnant woman generally receives about 10 times of prenatal care during her pregnancy, a check-up up every month until the first 28 weeks, then every two weeks until the 36th week, and later, every week until the 40th week or the delivery (Akadlı-Ergöçmen, et al., 2014). The average number of prenatal follow-ups (12.41±4.33) reported in another study conducted in Turkey (Izmir) is even greater than ours (Yücel, Çiçeklioğlu, Öcek, & Taner, 2015). Similar to our results, the same study also reported that the most pregnant women received prenatal services from state hospitals and family health centres (Yücel, et al., 2015). Increasing the number of follow-ups may increase the cost of prenatal care. Because of this, carefully identifying low-risk pregnancies and scheduling follow-up intervals according to the recommendations of WHO and national standards may make these services more cost-effective.

It was calculated in the present study that the total average cost of prenatal care services is approximately $139. No study was detected in the literature about the total cost of prenatal care services. There are, however, studies in which the costs per patient of screenings for trisomy 21 (Beulen, et al., 2014), cell-free fetal DNA (Evans, et al., 2015), congenital heart disease (Pinto, et al., 2014), diagnosing gestational diabetes mellitus (O'Dea, et al., 2014; Werner, et al., 2012) and congenital toxoplasmosis (Prusa, et al., 2017) are reported. Knowing the total cost of prenatal care per pregnant woman may make it easier for families as well as health insurance companies to plan ahead for the services that may be demanded. The findings point to the importance of conducting more studies in this context.

It was found in our study that the larger portion of prenatal care costs consists of the pregnant woman's health insurance (approximately $96) and that the lesser portion ($25) comprises the amount paid by the pregnant woman and her family. In their examination of costs and cost-effectiveness in the 22nd-24th weeks of pregnancy, Caughey and Burchfield (2014) have similarly stated that care costs are divided into what is paid out by insurance coverage and what is paid out by the individual. This indicates that besides having a health insurance policy, a family's level of income is also important in being able to obtain prenatal care.

We found in our study that some pregnant women (n=66/403; 16.38%) received prenatal care at private hospitals/doctor's offices and that they paid more (approximately $110) for the services provided in this way. The choice taken here may be related to the status of education and income of the pregnant woman and her family. Çınaroğlu (2017) reported that in addition to factors such as service quality and accessibility, individuals with higher levels of education and income preferred more private institutions in their study on the factors affecting the choice of public and private health services. It was found in this study however that these factors had no effect on the total cost of prenatal care.

It was observed in our study that the total cost of prenatal care was not influenced by the educational level or status of employment of the pregnant woman or her spouse, or by the presence of health insurance, civil status, and family type, perceived income level or obstetric characteristics. This may be related to the low share in prenatal care costs that preg-

nant women and their families are required to contribute in Turkey, also to the value families place on their expected children and the degree to which they attach importance to prenatal care.

CONCLUSION AND RECOMMENDATIONS

This study yielded the results that: pregnant women receive prenatal care for an approximate average of 11 times and mostly at state hospitals and family health centres; prenatal care amounts to a total average cost of approximately $139, which is met in the large part by general health insurance ($96) and for a lesser part ($25) by individuals themselves; pregnant women receiving prenatal care from private hospitals/doctor's offices individually pay more ($110) to receive this care; and, some characteristics of pregnant women do not influence the total cost of prenatal care.

On the basis of the results obtained, it can be recommended that: (1) healthcare providers refer pregnant women with personal financial difficulties to the public hospitals and the number and scope of prenatal monitoring visits be organized according to prenatal risk status; (2) pregnant women are informed about the cost of prenatal care so that they are given the opportunity to make informed decisions about the care they receive; (3) health care managers, pregnant women and their families determine the number of places and follow-up to receive prenatal health services in a cost-effective manner; (4) the study be repeated with pregnant women to include a more comprehensive assortment of prenatal care data that are based on the records of healthcare institutions.

Study Limitations

There are some limitations to this study. The first limitation is that the questionnaires for the study were based on self-reporting and therefore the reliability of the data is limited to the information provided by the participants. The second limitation is that the study was cross-sectional and based on convenience sampling. Consequently, the data obtained are only representative of the participating women and may vary with time. The third limitation is that the study was conducted with women in weeks 36-42 of pregnancy. The results obtained may differ from evaluations based on time of delivery.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Aydın Adnan Menderes University (Approval number: 2015/742).

Informed Consent: The women recruited into the research were informed about the study and their verbal and written consent was obtained.

Peer-review: Externally peer-reviewed.

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Conflict of Interest: The authors have no conflicts of interest to declare.

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