Differentials in receiving postpartum care of infants and its determinants in Turkey

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The aim of this paper was to analyze the differentials in receiving postpartum care of infants in Turkey and the determinants of receiving postpartum care by infants in Turkey, using data from the 2008 Turkey Demographic and Health Survey and multivariate logistic analyses accounting for the complex sample design. The descriptive analyses indicated that the majority of infants receive postpartum care in Turkey, although there are disadvantaged groups. Analysis of the determinants of receiving postpartum care of infants indicated that the variables having the most explanatory power are bio-demographic or health-related variables that are directly related to health and/or birth. Following these variables, economic characteristics such as maternal health coverage and maternal educational level were observed to be effective, and additionally the demographic region.

Key words: postpartum care, infants, determinants, differentials, logistic regression, Turkey.

Neonatal deaths, which occur in the first 28 days of an infant's life, account for 40% of all under-five child deaths in developing countries every year. Seventy-five percent of these deaths take place in the early neonatal period (first 7 days after birth)[1]. These shares are even higher for Turkey: 54% of all child deaths annually occur in the neonatal period and 87% of these in the early neonatal age, as of 2008[2].

In Turkey, the infant mortality rate was observed to decline very rapidly in the 2000s[2]. In the early 1990s, the infant mortality rate was 66 per thousand, and by 2008, this rate had reduced to 17 per thousand, which is similar to rates in countries represented by the upper-middle income group according to the World Health Organization (WHO) classification[2,3]. Since the 1990s, the proportion of post-neonatal deaths among total infant deaths decreased, while the share of deaths in the neonatal period among total infant deaths increased. In 2008, among 21,976 infant deaths, 16,805 occurred in the

neonatal and 14,613 in the early neonatal period in one year[2].

According to WHO[1], up to two-thirds of newborn deaths could be prevented if skilled health workers provided effective care during delivery and the first week of life, constituting the most critical period of the postpartum care. Complications for mother and infant can be prevented with postpartum care, which would detect problems earlier and facilitate their management. Antenatal and postnatal care affect newborn deaths directly and appear to be the most effective measures to decrease neonatal, especially early neonatal, deaths.

For the first time in Turkey, detailed information on postpartum care was collected in the 2008 Turkey Demographic and Health Survey (TDHS-2008)[4]. This paper analyzes the determinants of receiving postpartum care of infants in Turkey using these data. In contrast to a previous study of Türkyılmaz et al.[5] on the

same subject, in this study, the variables of ethnicity (as the mother tongue of the mother and her husband) were included in the analyses. First, the health-related, sociodemographic and economic differentials in receiving postpartum care of infants in Turkey were investigated. Thereafter, multivariate logistic analyses on the determinants of receiving postpartum care of infants, taking the complex sample design into consideration, were carried out to investigate the differentials in a multivariate setting.

Material and Methods

This study uses data from the TDHS-2008. In the TDHS-2008, of the 13,521 households selected, interviews were completed with 10,525 households. Ever-married women aged 15-49 years, who generally live in the household or slept in the household the night before the interview, were accepted as eligible for the individual interview. Interviews were conducted with 7,405 ever-married women aged 15-49 years in the TDHS-2008. The weighted number of live births of these women over the last five years was 2,768. The questions on receiving of postpartum care of infants related to these births constituted the data of this paper.

The conceptual framework used in this study is a modified version of the method developed by Fort et al.[6], which is shown in Figure 1. According to that model, variables related to antenatal care and delivery and correlates of postpartum care all determine the variables related to postpartum care received by the woman. We also used the same framework for analyzing determinants of receiving postnatal care of infants, since the same factors seem to affect receiving postpartum care by mothers and infants according to our descriptive analyses. Different from the original conceptual model, we selected different correlates and used place of delivery as an explanatory variable in the final model.

Multivariate analyses were used to investigate the determinants of (not) receiving postpartum care by infants. When the status of receiving postpartum care is determined, as in its conventional way, the timing of postpartum care is also taken into consideration. According to Rutstein and Rojas[7], when care is received later than 41 days postpartum, the births should be considered as "not having received

postpartum care".

Multivariate logistic regressions were used and odds ratios were computed to estimate the likelihood of postpartum care not to occur (compared to receiving postpartum care) for each category of independent variables. The binary dependent variable of postpartum care in the analyses takes the value of "0" for "received" and "1" for "not received". Since the reference category of the dependent variable is defined as "receiving postpartum care", the odds ratios should be interpreted as the relative risk of not receiving relative to receiving postpartum care by infants. Among the explanatory variables, relatively better off categories are defined as the reference category of the related variable.

The model constructions consist of four stages involving the introduction of four groups of variables at each stage to see the additive effects of each group of variables on the dependent variable (Fig. 2). The first model includes the variables of "environmental characteristics", which are urban-rural place of residence and region. The second model additionally has variables linked to the status of the mother (and father), which are the mother tongue of the mother and her husband, the mother's blood relationship to her spouse, the mother's attitudes towards gender roles (the level of her traditional views), the educational levels of the mother and her husband, the type of marriage of the parents, and the family structure. Economic characteristics are added further in the third model, which involves the variables of the mother's sector of employment, the mother's health insurance, the household welfare status, and the mother's social insurance. In contrast to previous models, the final model includes health-related variables. The mother's age at birth, birth order, antenatal care, and place of delivery are included additionally in this final model.

Results

Table I presents the percent distribution of infants and the percentage of infants who did not receive any postpartum care according to some background characteristics. These descriptive results point out differentials in receiving postpartum care among infants according to several characteristics. Eleven percent of infants in Turkey do not receive

any postnatal care within 41 days after birth. Whether the mother received postpartum care or not seems to be associated with the infant receiving postnatal care: Among births where the mother did not receive any postpartum care, 39% of infants also received no care.

Multivariate results regarding all four models can be seen in Table II. According to the results of the final model of determinants of not
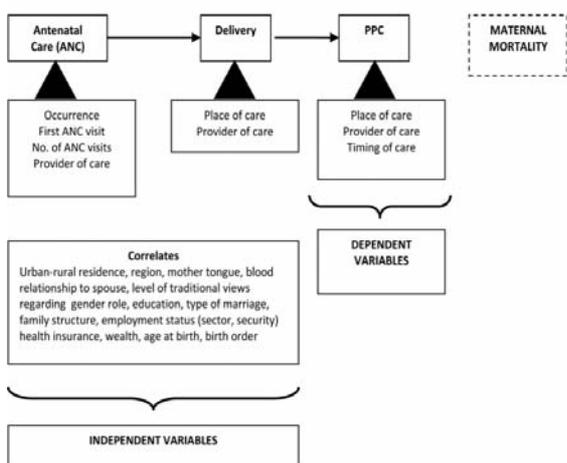
Note: Influenced by Fort et al. (2006: 5), who presented the original framework.
Fig. 1. Conceptual framework for the study of the determinants of postpartum care (PPC).

receiving postpartum care by the infant, place of delivery –whether the birth is institutional or non-institutional- and adequate antenatal care are highly significant determinants of postpartum care received by infants. This model has Nagelgerke R-squared of 0.338, i.e. the model explains 34% of the likelihood of not receiving any postpartum care of infants overall.

The highest odds ratio is seen for infants whose births were non-institutional. These infants were 4.5 times more likely to not receive any postnatal care than infants with institutional births. Infants whose mothers received no antenatal care were 1.9 times more likely to not receive any postnatal care compared to those whose mothers received antenatal care.

Infants whose mothers live in the Eastern region are 4.2 times more likely to not receive any postpartum care than their counterparts living in the Western region. Infants of women living in Southern and Central regions are more likely to not receive postpartum care as well.

The educational level of the mother is also a significant determinant of postpartum care received by the infant: An infant of a woman without any education or with incomplete primary level education was 3.2 times more likely to not receive any postpartum care compared to an infant whose mother completed high school or a higher level education.

The type of health insurance of the mother is also an important determinant: Infants of women with no health insurance had higher risks of not receiving any postpartum care as compared with infants of women with health insurance from the Pension Fund (Emekli Sandığı). Infants of women with health insurance from the Social Security Organization for Artisans and Craftsmen (Bağ-Kur) were disadvantaged as well in terms of postpartum care. They were 3.5 times more likely to lack postpartum care than infants of women with Pension Fund health insurance.
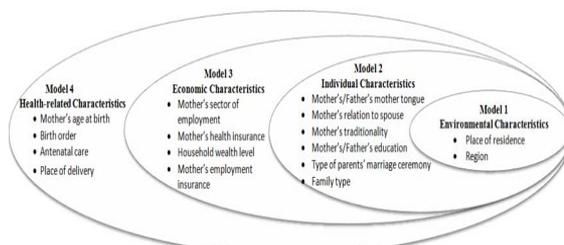
Fig. 2. Construction of the final model to obtain determinants of not receiving any postpartum care by the infant.

Discussion

The results of this study, which analyzed the socioeconomic and bio-demographic differentials in receiving postpartum care by infants in Turkey, indicate that the most influential variable determining receipt of postpartum care is the place of delivery. The likelihood of not receiving any postpartum care increases 4.5 times for an infant with a non-institutional birthplace compared to an infant with an institutional birth.

When determinants of postnatal care among infants were analyzed, it was seen that: Having a mother living in the Eastern, Southern or Central region; having an uneducated or first level primary-educated mother; having a mother

Table I. Percent Distribution of Infants and Percentage of Infants Receiving No Postpartum Care According to Background Characteristics, TDHS-2008

	n	%	No postpartum care (%)
Environmental characteristics			
Place of residence			
Urban	2,049	74.0	7.9
Rural	719	26.0	20.2
Region			
West	1,004	36.3	4.0
South	354	12.8	11.2
Central	627	22.6	5.9
North	165	6.0	4.6
East	619	22.4	29.5
Individual characteristics			
Mother's mother tongue			
Turkish	2,086	75.4	5.9
Kurdish	588	21.2	27.8
Other	94	3.4	21.9
Father's mother tongue			
Turkish	2,063	74.6	5.8
Kurdish	608	22.0	27.5
Other	92	3.3	20.6
Mother's blood relation to spouse			
First-degree relation	332	12.1	20.3
Other relation	318	11.6	11.4
None	2,081	76.2	9.5
Mother's attitude towards gender roles (level of traditional views)			
Low	825	29.8	5.9
Medium	993	35.9	8.8
High	950	34.3	18.0
Mother's level of education			
None/Primary incomplete	541	19.5	27.9
First level primary	1,365	49.3	10.1
Second level primary	272	9.8	4.0
High school or higher	591	21.3	1.3
Father's level of education			
None/Primary incomplete	149	5.4	28.3
First level primary	1,284	46.6	15.5
Second level primary	411	14.9	6.9
High school or higher	913	33.1	3.8
Type of marriage ceremony			
Only religious or none	117	4.3	24.2
Civil	2,618	95.7	10.4

Family type			
Nuclear	1,930	69.8	9.5
Extended	783	28.3	14.7
Dissolved	51	1.8	15.9
Economic characteristics			
Mother's sector of employment			
Unemployed	2,132	77.0	11.2
Agriculture	287	10.4	18.3
Non-agriculture	349	12.6	4.5
Mother's employment insurance[a]			
Unemployed	2,132	77.0	11.2
Employed without insurance	420	15.2	15.7
Employed with insurance	216	7.8	1.1
Mother's health insurance			
None	459	16.6	18.1
Social insurance institution	1,233	44.7	5.6
Pension fund[b]	222	8.0	1.4
Social Sec. Org. for Artisans & Craftsmen	291	10.5	9.4
Green card	555	20.1	22.4
Household wealth level			
Poorest	572	20.7	28.6
Poorer	635	22.9	12.0
Middle	597	21.6	6.7
Richer	497	18.0	3.7
Richest	466	16.8	1.7
Health-related characteristics			
Mother's age at birth			
< 20	221	8.0	11.9
20-34	2,273	82.1	10.6
35-49	274	9.9	14.1
Birth order			
1	896	32.4	5.6
2-3	1,340	48.4	9.6
4-5	362	13.1	20.3
6+	171	6.2	32.1
Mother's antenatal care			
None	216	7.8	38.7
Inadequate	714	25.9	16.7
Adequate	1,827	66.3	5.4
Place of delivery			
Institutional	2,561	92.8	7.6
Non-institutional	200	7.2	53.5
Total	2,768	100.0	11.1

Table II. Determinants of Not Receiving Any Postpartum Care by Infants According to Logistic Regression Results

Additional group of variables	Model 1 Environmental characteristics		Model 2 Women's characteristics		Model 3 Economic characteristics		Model 4 Health-related characteristics	
	Odds Ratio	CI (95%)	Odds Ratio	CI (95%)	Odds Ratio	CI (95%)	Odds Ratio	CI (95%)
Place of residence	**							
Urban	1.000		1.000		1.000		1.000	
Rural	2.093**	(1.61-2.72)	1.390*	(1.05-1.83)	0.988	(0.72-1.35)	0.932	(0.66-1.31)
Region	**		**		**		**	
West	1.000		1.000		1.000		1.000	
South	2.549**	(1.40-4.65)	2.358**	(1.31-4.25)	2.166**	(1.24-3.78)	2.200**	(1.26-3.85)
Central	1.288	(0.71-2.33)	1.861*	(1.04-3.34)	1.854*	(1.04-3.29)	1.816*	(1.01-3.26)
North	0.867	(0.43-1.75)	1.220	(0.59-2.53)	1.243	(0.58-2.67)	1.114	(0.50-2.50)
East	8.017**	(5.03-12.79)	4.973**	(2.98-8.30)	4.618**	(2.80-7.61)	4.244**	(2.55-7.06)
Mother's mother tongue								
Turkish			1.000		1.000		1.000	
Kurdish			1.140	(0.60-2.18)	1.169	(0.61-2.23)	0.972	(0.51-1.86)
Other			2.597*	(1.01-6.66)	2.681*	(1.07-6.70)	1.963	(0.64-6.03)
Father's mother tongue								
Turkish			1.000		1.000		1.000	
Kurdish			1.407	(0.79-2.50)	1.371	(0.79-2.37)	1.232	(0.69-2.21)
Other			0.550	(0.16-1.92)	0.505	(0.15-1.67)	0.612	(0.14-2.58)
Mother's blood relation to spouse								
First-degree relation			0.999	(0.72-1.38)	0.960	(0.70-1.32)	0.909	(0.64-1.28)
Other relation			0.725	(0.51-1.04)	0.725	(0.51-1.03)	0.729	(0.49-1.09)
No relationship			1.000		1.000		1.000	
Level of traditional views towards gender roles			*		*		*	
Low			1.000		1.000		1.000	
Medium			1.001	(0.69-1.45)	0.964	(0.65-1.42)	0.997	(0.66-1.50)
High			1.437*	(1.02-2.02)	1.362	(0.96-1.94)	1.406	(0.97-2.03)
Mother's level of education			**		**		**	
None/Primary incomplete			6.563**	(3.22-13.36)	4.435**	(2.03-9.69)	3.239**	(1.48-7.09)
First level primary			5.325**	(2.80-10.11)	3.854**	(1.88-7.88)	3.162**	(1.54-6.51)
Second level primary			2.419*	(1.15-5.07)	1.870	(0.84-4.14)	1.646	(0.77-3.53)
High school or higher			1.000		1.000		1.000	
Father's level of education			**					
None/Primary incomplete			1.912*	(1.10-3.31)	1.333	(0.76-2.33)	1.246	(0.70-2.22)
First level primary			1.970**	(1.34-2.90)	1.491	(0.98-2.26)	1.372	(0.89-2.11)
Second level primary			1.235	(0.79-1.94)	1.019	(0.64-1.62)	0.982	(0.62-1.56)
High school or higher			1.000		1.000		1.000	

	Model 1 OR	CI	Model 2 OR	CI	Model 3 OR	CI	Model 4 OR	CI
Type of marriage ceremony								
Only religious or none			1.184	(0.70-1.99)	0.953	(0.56-1.63)	0.805	(0.45-1.43)
Civil			1.000		1.000		1.000	
Family type								
Nuclear			1.000		1.000		1.000	
Extended			1.118	(0.88-1.42)	1.047	(0.82-1.33)	1.103	(0.84-1.45)
Dissolved			1.640	(0.52-5.19)	1.652	(0.47-5.78)	1.830	(0.50-6.64)
Mother's sector of employment								
Unemployed					2.245	(0.45-11.14)	2.382	
Agriculture					0.844	(0.43-1.67)	0.960	
Non-agriculture					1.000		1.000	
Mother's employment insurance[a]								
Employed without insurance					2.616	(0.53-13.02)	2.322	(0.43-12.66)
Employed with insurance					1.000		1.000	
Mother's health insurance					**		*	
None					4.063**	(1.59-10.36)	3.529*	(1.34-9.32)
Social insurance institution					2.252	(0.92-5.50)	2.304	(0.94-5.62)
Pension fund[b]					1.000		1.000	
Social Sec. Org. for Artisans & Craftsmen					3.892**	(1.54-9.86)	3.452**	(1.36-8.78)
Green card					2.359	(0.96-5.80)	2.254	(0.90-5.66)
Household wealth level					**			
Poorest					2.372*	(1.02-5.50)	2.368	(0.99-5.67)
Poorer					1.306	(0.60-2.84)	1.616	(0.73-3.56)
Middle					1.147	(0.52-2.53)	1.562	(0.71-3.42)
Richer					0.954	(0.42-2.15)	1.272	(0.56-2.87)
Richest					1.000		1.000	
Mother's age at birth								
< 20							1.340	(0.78-2.30)
20-34							1.000	
35-49							0.920	(0.53-1.59)
Birth order								
1							1.000	
2-3							1.264	(0.80-2.00)
4-5							1.362	(0.78-2.37)
6+							1.071	(0.58-1.99)
Mother's antenatal care							**	
None							1.925**	(1.29-2.87)
Inadequate							1.306	(0.95-1.80)
Adequate							1.000	
Place of delivery							**	
Institutional							1.000	
Non-institutional							4.452**	(3.05-6.50)
Nagelkerke R^2	0.191		0.265		0.286		0.337	
Wald F Model	43.600		20.582		13.722		16.060	

CI: Confidence interval.* Significance level $p<0.05$; ** Significance level $p<0.01$; Insignificant otherwise. Reference categories are shown in italic.

[a]Category of "unemployed" is not presented under this variable, but only under "mother's sector of employment".

[b]Category of "other health insurance" is included in this variable, which is most likely private health insurance.

with health insurance from the Social Security Organization for Artisans and Craftsmen, or none at all; having a mother who received no antenatal care; and having a non-institutional birth all decrease the likelihood of receiving postnatal care among infants. An important finding in this model is that for infants, bio-demographic or health-related characteristics and the educational level of the mother were found to be the determinants of postpartum care rather than environmental characteristics. In the models, for infants, when economic characteristics are controlled, the variable of place of residence becomes insignificant. However, there are disparities in the likelihood of receiving postpartum care at the regional level: Infants of women living in Eastern, Southern and Central Anatolia regions risk a lack of postpartum care compared to infants in the Western region. A second important finding is that health coverage of the mother determines the postpartum care received by the infant.

To conclude, the indicators of postpartum care show that the majority of infants receive postpartum care in Turkey. However, descriptive findings indicate that there are disadvantaged groups with respect to receiving postpartum care. These groups can be defined as infants of women living in the Eastern region, whose mother tongue is Kurdish, who are uneducated, who work without any social security or work in the agricultural sector, who have health insurance in the form of Green Card or none, who live in a poor household, who have received inadequate antenatal care or none, whose age at motherhood is outside the age group of 20-34, and who had a non-institutional birth. The infants of these women seem to have difficulties in accessing or making use of postpartum care services. Policies should be developed targeting these population groups to improve access to postpartum care for infants.

In a multivariate setting, the region, place of delivery, receiving antenatal care, maternal health insurance, and maternal educational level appear to be the most important determinants of receiving postpartum care of infants. In Turkey, 10% of births were non-institutional (in the home or elsewhere) in the five years prior to 2008[4], and institutionalizing these births would seem to have the greatest effect in reducing the lack of postnatal care. Antenatal care coverage is another strong tool to increase postnatal care. In the long run, improving women's education and health coverage appears to be an effective means to increase postpartum care among infants, which would allow us to achieve further declines in neonatal and hence infant mortality rates in Turkey.

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