Social predictors of caesarean section births in Italy

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Abstract

Background: Caesarean section birth is a frequent mode of delivery worldwide. Several social factors have been demonstrated to be strong predictors of caesarean births.

Objectives: To identify possible social predictors of caesarean section births in Italy.

Methods: Data for this study were drawn from the Italian Institute of Statistics (ISTAT) survey conducted during year 2005 which comprised a nationally representative sample of 50,474 households (128,040 subjects). This 2005 ISTAT survey asked several questions to women who delivered (n=5,812) in the past five years prior to the survey about their delivery mode. The main dependent variables were caesarean delivery rates while independent variables included sociodemographics, health and health-related factors. Descriptive statistics, bivariate and multivariate analyses were performed.

Results: Our sample comprised 5,812 women. Rate of caesarean deliveries was 36.2 percent. Age (adjOR: 0.961; p=0.000) and residence (Reference: North-West; Centre: adjOR: 0.753, p=0.001; South: adjOR: 0.484, p=0.000; Islands: adjOR: 0.629, p=0.000) were the sole social factors which were significant in predicting caesarean delivery (adjusted model).

Conclusions: Rate of caesarean delivery in Italy is rather high. Age and residence are the sole social predictors evidenced from the ISTAT 2005 survey data.

Keywords: caesarean births, social predictors, Italy.

Introduction

Caesarean section (CS) birth is a widespread mode of delivery worldwide in both developed anddeveloping countries[1-4]. It probably is the most practiced surgical intervention in areas like sub-Saharan Africa[5,6]. It can be performed in emergency context or on an elective basis and its main indications include previous caesarean section, labour dystocia or cephalopelvic disproportion, placenta previa or known vasa previa, conjoined twins, abdominal cerclage and abruptio placentae[7].

Several social factors have been demonstrated to predict delivery by CS. Race/ethnicity, age, educational attainment, employment, income and areas of residence have been investigated in relation to CS birth. Results frequently showed that positive predictors include black race[8,9], older ages[9-11], some types of employment, and areas of residence[12-15], lower educational attainment[12,16] and high income[15,17].

This study intends investigate and update data about the social factors associated with CS birth in Italy, a developed country whose population is demographically characterized by a high rate of ageing population and a low birth rate[18].

Methods

Design and tool

Data for this study were drawn from the Italian National Institute of Statistics (ISTAT) survey conducted during the year 2005[19]. This is a quinquennial multipurpose population-based cross-sectional survey with a complex design (stratified multistage random sampling). The 2005 survey comprised a nationally representative sample of 50,474 households (128,040 subjects). Inclusion criteria consisted of Italian women, resident in Italy, who delivered in the past five years prior to the survey and were not institutionalized at the moment of the survey. The following groups were excluded: immigrants, homeless subjects and, residents of rest homes, religious houses and penitentiaries.

The 2005 ISTAT survey asked several questions about the delivery mode including whether (yes vs. no) the mother delivered by caesarean section. The comprehensive questionnaire (filled and administered by ISTAT professionals) used in the survey included socio demographics, healthcare, health and health-related factors.

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Variables

As dependent variables, we used delivery mode (caesarean vs. vaginal) rates, while the explanatory variables consisted of all relevant available socio demographics, health factors, healthcare, and health-related behaviour (yes vs. no) and social support defined as availability of friends and/or neighbours in situations of needs (yes vs. no). Socioeconomic status was assessed by using age (cut-off: 30 years), educational attainment (college levels vs. others), employment status (employed vs. others), contractual conditions (term vs. termless contracts) and self-reported wealth using income as a proxy (optimal-adequate vs. scarce-inadequate). Residence, a 5-categories variable (five macro areas: North-west, North-east, Centre, South and Islands), was included in models as dummy variables (reference: North-West).

Statistical analysis

Virtually all the variables of interest were systematically dichotomized by appropriate procedures in order to perform bivariate tests (T-Student t-test, Pearson chi-squared test). Multiple logistic regressions included binary and dummy variables. We first performed descriptive statistics. We then followed Student t-test and Pearson chi-squared test in order to examine relationships between several variables and the caesarean births rate. We finally conducted multivariate analyses (multiple logistic regressions) in search of models which best fitted the data. Models included socio demographic factors adjusted for potential confounders (healthcare, health, health-related factors, and social support). Models' fitting was based on the strategy of stepwise backward selection while the diagnosis was based on standard post logistic tests (pseudo-R2, post logistic Hosmer-Lemeshow test and ROC curve). All these analyses were carried out by the statistical package STATA 10.1/SE[20]. Levels of statistical significance were set to 0.05.

Results

Socio demographics

Our sample comprises 5,812 women (respondent women who delivered the past five years prior to the survey). South macro area shares the highest proportion (31.6%; n=1,835) of this population while the Islands have the lowest (10.7%; n=623). The centre macro area shares 17.0% (n=990) of this population (table 1). The mean age of this population is 34 years (SD: 5.22). The bulk of this population group is concentrated in the age groups 4 (30-34 years; 34.4%) and 5 (35-39 years; 31.5%), 85.5% are married or living with the partner, 14.7% is university/college graduated or has some college education, 54.0% is actually employed and 8% are unemployed searching for jobs and finally only 3.5% rated their income as being optimal (table 1).

Table 1: Distribution of the sample by socio demographic factors

Variable	Categories	Absolute frequency (n)	Relative frequency (%)
Residence (geographic macro areas)			
	-North-West	1,136	19.5
	-North-East	1,228	21.1
	-Centre	990	17.0
	-South	1,835	31.6
	-Islands	623	10.7
Age groups	< 18 years	4	0.1
	18-24 years	223	3.8
	25-29 years	885	15.2
	30-34 years	1,998	34.4
	35-39 years	1,831	31.5
	40-44 years	105	1.8
	eˆ 45 years	105	1.8
Marital status	-Singles	435	7.5
	-Married/ living with partner	4,970	85.5

Variable	Categories	Absolute frequency (n)	Relative frequency (%)
	-De facto separated	142	2.4
	-Legally separated	141	2.4
	-Divorced	93	1.6
	-Widower	30	0.5
Educational attainment	-Doctorate PhD and post college graduate	30	0.5
	-College graduate (4 years and over)	606	10.4
	-Other university graduate/ levels	217	3.8
	-High school graduate (4-5 yrs.)	2,254	38.8
	-Less than high school graduate	2,705	46.5
Employment status	-Employed	3,131	53.9
	-Unemployed searching jobs	467	8.0
	-Housewives	2,141	36.8
	-Others	73	1.3
Income (self-rated)	-Optimal	201	3.5
	-Adequate	3,319	67.4
	-Scarce	1,412	24.3
	-Insufficient	280	4.8
Social support (parents)	Yes	5,173	11.0
	No	639	11.0
Social support (friends)	Yes	3,869	67.0
	No	1,943	33.0
Social support (neighbours)			
	Yes	2,815	48.0
	No	2,997	52.0
Housing conditions (heating)			
	Yes	5,258	90.5
	No	554	9.5
Housing conditions (WC & bathroom)			
	Yes	5,785	99.5
	No	27	0.5
Housing conditions (elevator)			
	Yes	1,194	20.5
	No	4,618	79.5
Housing conditions (staircase)			
	Yes	2,040	35.0
	No	3,772	65.0

Table 2: Proportions of women who delivered by caesarean section, overall and by selected socio demographic factors (statistic: Chi-squared test p-value)

Variable	Categories	Percentage %		p
		Yes	No	
Overall				
		36.2	63.8	-
Geographic areas	North-West	29.0		0.000
	North-East	29.0		
	Centre	35.3		
	South	45.3		
	Islands	38.5		
Age groups (years)	<30			
	≥30	33.02	39.0	0.000
Current marital status	Married	36.1	36.5	0.848
	Others			
Previous marital status	Singles	36.1	41.0	0.522
	Others			
Education attainment	College levels	37.2	36.0	0.512
	Others			
Employment status	Employed	35.2	37.3	0.086
	Others			
Contractual conditions	Termless contracts	37.3	34.3	0.278
	Term contracts			
Income (self-rated)	Adequate	36.0	37.0	0.469
	Inadequate			
Social support (parents)	Yes	36.0	38.3	0.225
	No			
Social support (friends)	Yes	35.3	38.0	0.041
	No			
Social support (neighbours)	Yes	36.0	37.0	0.410
	No			

Caesarean births

Of these 5,812 respondent women, 2,102 delivered by caesarean section. Caesarean delivery rate was 36.2 percent overall (table 2). Social factors which resulted associated to caesarean section in adjusted multivariate analysis were age (p=0.000) and residence (Reference: North-Western area; Centre: adjOR: 0.753, p=0.001; South: adjOR: 0.484, p=0.000; Islands: adjOR: 0.629, p=0.000) (Table 3).

Table 3: Logistic regression caesarean births: sociodemographics adjusted for healthcare, health, health-related factors and social support

Caesarean births	Odds Ratio	P>|z|	[95% Conf. Interval]	
North Western	1.000			
Centre macro area	0.753	0.001	0.640	0.886
South macro area	0.484	0.000	0.421	0.556
Islands macro area	0.629	0.000	0.518	0.762
Age	0.961	0.000	0.951	0.971
Obese	1.640	0.000	1.287	2.090
No health problems in pregnancy	0.767	0.000	0.686	0.858
Public MCH centre utilization	0.848	0.046	0.722	0.997
Antenatal classes attendance	0.798	0.001	0.700	0.908
Term birth	0.215	0.000	0.138	0.335
Singleton births	0.199	0.000	0.128	0.309
Public hospital attendance	0.631	0.010	0.445	0.893

Continuation of table 3

Caesarean births	Odds Ratio	P>|z|	[95% Conf. Interval]	
Good self-rated health status	0.578	0.050	0.335	0.999
Not smoker prior to pregnancy	0.766	0.000	0.671	0.874
No social support (friends)	1.123	0.052	0.999	1.262

Logistic regression: Prob > chi2 = 0.000   Pseudo R2= 0.0520
Postlogistic Hosmer-Lemeshow test: Prob > chi2 = 0.8712
Post logistic ROC curve: Area under ROC curve = 0.6462

Discussion

Overall, 36.2% (n=2,102) of the women from this sample delivered by caesarean section. This is substantially more than the WHO recommendations which stated that 15% shall be the expected maximum rate[21]. Nevertheless, it is similar or slightly different from percentages reported in studies conducted in many other countries worldwide[1-4]. This diffused high rate of caesarean births is worrying especially since a large percentage has no clear medical indication[22]. Problems of financial burden and significant morbidity can't also be overlooked. Contrary to a precedent Italian study by Cesaroni[23], our study didn't find an association between educational attainments (or several other socioeconomic predictors excepted for age and residence) and caesarean section birth rates.

Geographical differentials North-South in socioeconomic factors, health and health behaviours is a well documented fact in Italy[24]. Our findings are surprising as they show that living in the centre and southern macro areas and not in the affluent north has a protective effect against cesarean section births. However, similar results have also been documented in a previous Italian study conducted by Paparizzi et al.[25]. Cultural factors (different attitude about on-request caesarean sections) and healthcare behaviors (different utilization of public and private services in various geographical areas) are probably the causes behind this singular fact.

Extreme ages including older ones are constantly recorded as being at higher odds of caesarean section births. Reasons are numerous and include, among others, psychosocial (fear of losing the baby!) and medical factors (high risks of fibrous uterus or pregnancy-related health disorders)[26]. In our study, age seems to have a protective effect against caesarean section. These odd results deserve further investigations.

Important social factors like educational attainment, employment status, or income seem to have had a marginal role in the mentioned survey but problems of information bias cannot be ruled out.

To sum up, data from our study show that age and residence are the relevant social predictors of caesarean section births in Italy.

The limits of this study include the non specification of response rate, the non differentiation between repeated and first caesarean sections and "on request" caesarean sections from those performed following medical indications.

Conclusion

Caesarean delivery among Italian women is rather high (36.2%). Younger women and northern macro areas are categories at particularly high risks.

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