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CLINICAL ARTICLE

Association between educational level and access to safe abortion in a Brazilian population

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ABSTRACT

Objective: To evaluate sociodemographic factors associated with induced abortion. **Methods:** As part of a cross-sectional, descriptive study, 15 800 civil servants from Campinas, Brazil, were invited to complete a self-administered questionnaire about absolutely unwanted pregnancies in January 2010. Bivariate analysis and multivariate Poisson regression analysis were used to explore the associations between induced abortion and sociodemographic characteristics. **Results:** Overall, 1660 questionnaires were returned. Unwanted pregnancy was reported by 296 (17.8%) respondents, of whom 165 (55.7%) resorted to abortion. Multiple regression analysis showed that college education was the only variable associated with an increased chance of abortion. Among 157 participants who answered questions about the abortion procedure, 97 (61.8%) reported that it had been performed by a physician. Following abortion, 35 (22.9%) of 153 reported that medical care was required and 26 (16.6%) of 157 reported hospitalization, principally those with a lower level of education and those whose abortion had been performed by a nonphysician. **Conclusion:** Compared with women with a college education, those with a lower education level were less likely to terminate an absolutely unwanted pregnancy and to have an abortion performed by a physician, and they were more likely to have complications. These findings confirm the social inequalities associated with abortion in Brazil.

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1. Introduction

Approximately half of all pregnancies worldwide are unplanned, often leading to unsafe abortions and the unnecessary deaths of thousands of healthy young women, particularly in countries where abortion laws are restrictive [1]. In Brazil, abortion is permitted if performed by a physician and if the pregnancy results from rape or threatens the woman's life. In 2012, the Supreme Federal Court also approved pregnancy terminations in cases of anencephaly [2]. In spite of the legal restrictions, the estimated number of induced abortions per year in Brazil is approximately 1 million. Only a small fraction of these pregnancy terminations can be classified as "legal abortions" [3–7].

The introduction of misoprostol for gastrointestinal indications in the late 1980s and its widespread use by women for the clandestine termination of their pregnancies has led to a considerable reduction in morbidity [8,9]. Nevertheless, it is still generally accepted that the lower a woman's socioeconomic level, the higher her risk of complications from an unsafe abortion, although there is little evidence to confirm this hypothesis.

The present study assessed the association between women's education level and the proportion of absolutely unwanted pregnancies that were terminated. In addition, women's access to a physician-performed abortion and the complications resulting from that abortion—defined as the need for postabortion medical care and admission to hospital—were evaluated, with control for various sociodemographic variables.

2. Materials and methods

As part of a cross-sectional, descriptive study, 15 800 male and female civil servants in Campinas in the state of São Paulo, Brazil, were invited to complete a questionnaire in January 2010. São Paulo State has over 41 million inhabitants and Campinas has a population of approximately 1 million. The present study complied with the Brazilian ethics regulations for investigations in people [10], and the protocol was approved by the Internal Review Board of the School of Medical Sciences, University of Campinas, São Paulo, Brazil. Participation in the study was voluntary. An invitation letter explained the study and contained all the information required by the Brazilian authorities. It was understood that the respondents were giving their consent to participate by answering and returning the questionnaire. Anonymity was ensured because the questionnaire did not request any identifying information.

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A self-administered questionnaire with coded answers, a cover letter, and a prepaid return envelope were sent to the employees together with their paylips. To increase the response rate, the pack was resent to all employees 1 month later (it was sent twice to all potential participants because the responses were anonymous). To prevent duplicate responses, the employees were asked to ignore the second invitation if they had already replied.

Female respondents were asked whether they had ever had an absolutely unwanted pregnancy, whether they had felt the need to terminate that pregnancy, and what they did on that occasion. Male respondents were asked the same questions about any female partner. Respondents who reported having had an induced abortion were asked how the abortion had been performed.

The completed questionnaires were reviewed and numbered on their return. Two individuals entered the data into two separate databases to check for consistency. The data were verified with SPSS version 20.0 (IBM, Armonk, NY, USA) and analyzed with SPSS version 20.0 and Stata version 7.0 (StataCorp, College Station, TX, USA). The χ^2 test [11] was used in all contingency tables and $P < 0.05$ was considered statistically significant.

The sample size was calculated to be 255 on the basis of the estimate that 79.0% of people would opt to have an abortion if faced with an unwanted pregnancy [12]. A significance level of 5.0% was established, with an absolute difference (margin of error) of 5% between the sample proportion and the population proportion—i.e. from 74% to 84%.

To study the association between demographic variables and behavior with respect to induced abortion, multivariate Poisson regression models were constructed because this method produces robust prevalence ratio estimates in cross-sectional studies [13]. The dependent variables analyzed in each model varied: induced abortion at the time of an absolutely unwanted pregnancy (yes vs no) was assessed in model 1; need for medical care (yes vs no) in model 2; and need for hospitalization (yes vs no) in model 3. Models 2 and 3 relate to post-abortion complications. The sociodemographic variables (independent variables) analyzed referred to the time when the unwanted pregnancy occurred and not the time when the respondent answered the questionnaire. The predictor variables for model 1 were sex of the respondent (male vs female), age (in years), partner's age (in years), education level of the respondent (high school or less vs at least some college education), marital status (living in a stable union vs not living in a stable union), number of children (none vs one or more), and use of contraception (yes vs no). For models 2 and 3, the only two predictor variables were the abortion provider (physician vs other) and the education level (high school or less vs at least some college education).

3. Results

Overall, 1660 questionnaires were included in the study (response rate 10.5%). Information about sex was available for 1648 individuals, of whom 1204 (73.1%) were women and 444 (26.9%) men. An absolutely unwanted pregnancy was reported by 296 (17.8%) participants, most of whom were women (Table 1). At the time of the unwanted pregnancy, almost half of respondents were aged 18–24 years (Table 1). Most had no children and were not living with a steady partner (Table 1). Almost half the respondents reporting an absolutely unwanted pregnancy had at least some college education (Table 1). Among the 1438 participants who provided their educational level, 199 (19.1%) of the 1042 with higher education reported unplanned pregnancies, compared with 94 (23.7%) of the 396 with less education ($P < 0.001$).

Almost one-third of the respondents were not using contraception at the time of the unwanted pregnancy (Table 1). The most common reason for not having used contraception was that sexual intercourse had not been planned, reported by 35 (38.9%) of 90 respondents (three respondents did not answer this question). Among the 193 who reported that they had been using contraception, 85 (44.0%) were using the rhythm and withdrawal method, 59 (30.6%) a combined

Table 1

Characteristics of participants reporting an absolutely unwanted pregnancy and an induced abortion.^a

Variable	Unwanted pregnancy (n = 296)	Induced abortion (n = 165)	P value
Sex			0.199
Female	209 (70.6)	111 (67.3)	
Male	87 (29.4)	54 (32.7)	
Participant's age at the time of unwanted pregnancy ^b			0.224
≤17	34 (12.5)	16 (10.3)	
18–24	130 (48.0)	81 (51.9)	
≥25	107 (39.5)	59 (37.8)	
Partner's age at the time of unwanted pregnancy ^c			0.725
≤17	11 (4.4)	6 (4.3)	
18–24	114 (45.2)	66 (47.5)	
≥25	127 (50.4)	67 (48.2)	
Number of children ^d			0.309
0	209 (73.3)	123 (76.9)	
1–2	64 (22.5)	31 (19.4)	
≥3	12 (4.2)	6 (3.8)	
Marital status ^e			0.004
Living in a stable union	77 (26.9)	32 (19.9)	
Not living in a stable union	209 (73.1)	129 (80.1)	
Education level ^f			<0.001
Elementary school	71 (25.1)	34 (21.3)	
High school	84 (29.7)	36 (22.5)	
At least some college education	128 (45.2)	90 (56.3)	
Contraceptive use at the time of unwanted pregnancy ^g			0.001
None	93 (32.5)	44 (27.2)	
Hormonal/surgical/intrauterine device	65 (22.7)	30 (18.5)	
Barrier/behavioral methods/combination of both	128 (44.8)	88 (54.3)	

^a Values are given as number (percentage) unless indicated otherwise.

^b Data missing for 25 participants (9 reporting induced abortion).

^c Data missing for 44 participants (26 reporting induced abortion).

^d Data missing for 11 participants (5 reporting induced abortion).

^e Data missing for 10 participants (4 reporting induced abortion).

^f Data missing for 13 participants (5 reporting induced abortion).

^g Data missing for 10 participants (3 reporting induced abortion).

oral contraceptive pill, 22 (11.4%) a barrier method, 3 (1.6%) an intra-uterine device, and 21 (10.9%) a combination of several methods. Among the 21 participants who used several methods, 14 (66.7%) used condoms, 4 (19.0%) used the pill, and 3 (14.3%) used a combination of behavioral methods.

Overall, 165 (55.7%) of the 296 respondents who had an absolutely unwanted pregnancy had an induced abortion. Of the 155 respondents who gave information about their age, 108 (69.7%) had their abortions before 1990. Ten (7.6%) of the 131 participants who elected not to have an induced abortion did not mention the reason to do so. The principal reason given by the other respondents was their church's opposition to abortion, given by 31 (34.4%) of 90 female respondents and 7 (22.6%) of 31 male respondents. Abortion being a crime was mentioned by 25 (27.8%) women and 3 (9.7%) men. More male than female respondents mentioned their partner's opposition (7 [22.6%] vs 8 [8.9%]), and more women than men did not have the money to pay for an abortion or did not know where to get one (12 [13.3%] vs 2 [6.5%]). A lack of courage to undergo the procedure was reported by 12 (13.3%) female participants only. Other reasons were mentioned by 12 (9.9%) of the 121 female and male respondents. The participants were permitted to give more than one reason.

Three of the respondents who opted for an induced abortion did not answer the question on the reason to terminate their pregnancies. Among the 162 who answered, 41 (37.3%) of 110 women and 19 (36.5%) of 52 men mentioned that they had not wanted to be a single parent—the most common reason. More women than men mentioned that the partner did not accept the pregnancy (39 [35.5%] vs 11 [21.2%]). Fear of their parents was a reason for 38 (34.5%) female

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