



Brief Intervention for Smoking Cessation During Pregnancy

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TO THE EDITOR,

The cessation of smoking during pregnancy preserves life and reduces health risks for the mother and the fetus.⁽¹⁾ In Brazil, a study carried out between 2011 and 2012 showed that the prevalence of active smoking during pregnancy was 9.6%.⁽²⁾ Interventions based on cognitive behavioral therapy, supported by educational material, are indicated as a first-line approach to smoking cessation during gestation.⁽³⁾

We conducted a parallel, randomized, controlled clinical trial with a 1:1 allocation ratio of 143 pregnant smokers who attended prenatal services at Primary Care health clinics and the Obstetrics Clinic of the University Hospital of the Botucatu Medical School – UNESP, SP, Brazil. The aim of the study was to determine the influence of a brief intervention based on tailored cognitive behavioral therapy, complemented with a video and a manual including content specifically developed for pregnant smokers, on smoking cessation rates during pregnancy and after delivery.

All participant pregnant smokers signed informed consent, answered a questionnaire, and underwent a 15-minute individual standardized counseling session. In addition, they received a printed manual and a DVD containing a video on both smoking-related content and its consequences to pregnancy and the fetus/newborn. The participants were randomized into an Intervention group (I), in which they were encouraged to participate in up to seven individual treatment sessions held on the same day as the prenatal visits, or a Control group (C), with no additional participation in individual treatment sessions. Abstinence rates were assessed upon each prenatal visit and 40 days after delivery, and the smoking status was confirmed by carbon monoxide measurements. The degree of nicotine dependence was determined using the Fargeström test,⁽⁴⁾ and the subjects' motivational stage was assessed according to the Prochaska and DiClemente transtheoretical model.⁽⁵⁾ Craving was evaluated by the Brief Questionnaire of Smoking Urges (QSU-Brief), validated for use in Brazil.⁽⁶⁾ The study was approved by the Research Ethics Committee of the Botucatu Medical School (Reference No. 430.718).

The sample size was calculated to identify a difference of 20% in the abstinence rate between groups, with a power of 90% and an alpha of 5% for tests of proportion. The required sample size was 117 individuals. Associations of primary outcome (smoking status 40 days after delivery) to the subjects' characteristics, adherence, degree of dependence, motivational stage, use of educational

material, and economic class were performed by logistic regression analysis.

The main characteristics of the participants are shown in Table 1. The individuals from the Control group were older than those from the Intervention group (29.5 ± 6.1 years vs. 24.3 ± 7.2 years, $p < 0.001$). Most of the pregnant women were in a stable union (66.9%), had only an elementary school level (57.4%), and belonged to the D and C2 Brazilian economic classes (58.1%), with no differences between groups. A statistically significant difference in the proportion of passive smoking (69% vs. 36%, $p < 0.001$) and of pregnant women in the contemplative stage (76.7% vs. 32%, $p < 0.001$) was found in the Intervention group compared to the Control group. In addition, a statistically significant difference in the smoking cessation rates was observed in the Intervention group as compared to the Control group (55.8% vs. 34%, $p = 0.026$). In the logistic regression model, the status 'active smoking after delivery' was associated with smoke loads >10 pack-years, participation in only one counseling session, exposure to secondhand smoke, and lack of use of educational material. Gestational age was also included in the logistic regression model, but a significant difference was not found. However, when analyzing the differences between medians, Gestational age was statistically different between groups (Table 1).

Our results showed that prenatal care educational programs with content related to the effects of smoking during pregnancy effectively enhanced smoking cessation, which increased with program intensity. The findings reported by Ferreira-Borges,⁽⁷⁾ who evaluated the impact of a twelve-minute counseling session and a booklet containing related information on smoking during pregnancy, corroborate our results regarding abstinence rate, confirmed by measuring the carbon monoxide in exhaled air, which was 33% in the Intervention group and 8.3% in the Control group ($p = 0.026$).⁷ Other studies assessing interventions during prenatal visits related to the problems that smoking may cause in pregnancy compared cessation strategies with routine prenatal guidance alone.^(8,9) In previous studies, biochemically confirmed smoking cessation rates varied between 35% and 39% in the Intervention groups and between 18.9% and 30% in the Control groups.^(8,9) Regression analysis showed a positive association of being a smoker 40 days after delivery with a smoke load >10 pack-years, secondhand smoke exposure, no use of educational material, and participation in only one counseling session. An important finding was the negative association between active smoking 40 days after delivery and a contemplative

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Table 1. Baseline characteristics of the studied groups.

Variables	I n = 77 (60.6%)	C n = 50 (39.4%)	p value
Age (years), mean ± SD	29.5 ± 6.1	24.3 ± 7.2	<0.001
Stable union, n (%)	47 (61.0)	38 (76.0)	0.119
Smoke load, cigarretes/day (range)	18 (8 - 28)	13 (5 - 23)	0.263
High nicotine dependence, n (%)	43 (56.0)	34 (68.0)	0.236
Intense craving prepartum, n (%)	10 (13.7)	29 (58.5)	0.007
Intense craving postpartum, n (%)	11 (14.2)	26 (53.1)	0.013
Previous cessation attempts, n (%)	38 (49.0)	14 (28.0)	0.027
Secondhand smoking, n (%)	53 (69.0)	18 (36.0)	<0.001
Contemplative stage, n (%)*	59 (77.0)	16 (32.0)	<0.001
Gestational age (weeks), n (%)*	12 (8-16)	24 (12-28)	<0.001

I: Intervention group. C: Control group. *Contemplative stage and Gestational age at baseline.

motivational stage towards cessation, indicating that the reinforcement of smoking cessation counseling during pregnancy provides positive results, regardless of the motivational stage. Stotts et al. also concluded that pregnant women who were contemplative at baseline migrated to the action stage and ceased smoking after treatment.⁽¹⁰⁾ Secondhand smoking and the number of cigarettes/day have also been previously described as risk factors for continuing smoking during gestation and after delivery.^(8,10)

Similar to our findings, a study comparing an experimental group of pregnant women who were provided brief counseling and a video and self-help manual with content aimed at smoking cessation with a control group that received only routine prenatal care showed a significant positive association between adherence to the intervention and abstinence after follow-up.⁽⁹⁾ In the present study, 81% of the pregnant women in the Intervention group participated in 4 or more sessions. Delivering the sessions during prenatal consultations was probably a key feature to obtain this result.

Some limitations should be considered in our study. The majority of women included in the study belonged to a high-risk pregnancy group; however, even in a sample with these characteristics, the intervention was successful. In addition, it was not possible to determine the long-term abstinence rate because the 6 and 12-month smoking status were not evaluated.

In conclusion, the results obtained in our study showed that the brief intervention supplemented with educational material had a positive effect on smoking abstinence rates in pregnant women. The incorporation of this intervention model during prenatal consultations opens the possibility of using similar approaches in other services. Our results reinforce the importance of more intense interventions with greater attention to those exposed to higher smoking levels, including secondhand smoking. Regardless of the motivational status and the degree of nicotine dependence, counseling and educational materials were effective in this group of pregnant women.

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AUTHOR CONTRIBUTIONS

ALB conducted the interviews with the pregnant women, gave them counseling, tabulated the data, and wrote the manuscript. SET performed the regression analysis. IG supervised the research procedures and revised the final version of the manuscript.

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