

Smoking and Pregnancy: the importance of Knowledge and Belief about the Health Consequences of Smoking

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Abstract

Many behavior factors have negative consequences for female reproductive health, one of them is smoking. This study aims to examine the pattern of tobacco use and knowledge about tobacco-related diseases, as well as to identify popular types of electronic media, in pregnant women, in order to improve strategies for the prevention or cessation of smoking among such women. A descriptive cross-sectional study is involving 100 pregnant women, seen at primary care clinics and at a public hospital, in the city of Surabaya, Indonesia. Of the 100 pregnant women evaluated only 61 women that respond such as, 25 (40.9%) were smokers (mean age, 26.4 ± 7.4 years), 24 (39.3%) were former smokers (26.4 ± 8.3 years), and 12 (19.8%) were never-smokers (25.1 ± 7.2 years). Thirty-nine women (63.9%) reported exposure to passive smoking. Of the 49 smokers/former smokers, 13 (26.5%) were aware of the pulmonary consequences of smoking; only 2 (4.1%) were aware of the cardiovascular risks; 23 (46.9%) believed that smoking does not harm the fetus or newborn infant; 21 (42.9%) drank alcohol during pregnancy; 18 (36.7%) reported increased cigarette consumption when drinking; 25 (51.0%) had smoked flavored cigarettes; and 12 (24.5%) had smoked a narghile. Among pregnant women, active smoking, passive smoking, and alternative forms of tobacco consumption appear to be highly prevalent, and such women seem to possess little knowledge about the consequences of tobacco use. Educational programs that include information about the consequences of all forms of tobacco use, employing new and effective formats tailored to this particular population, should be developed, in order to promote smoking prevention and cessation among pregnant women. Further samples to explore regional and cultural adaptations should be evaluated.

Key words: Pregnancy; knowledge, attitudes, practice; smoking; cessation

1. Introduction

In the current globalization era are many problems to be solved by the government and the general public. One very common problem now is the increased consumption of cigarettes among the community. Indonesia is one of the world's largest tobacco consumers. According to the Tobacco Atlas (2012), Indonesia ranked fourth among the countries with the highest aggregate levels of tobacco consumption in the world in 2012.

Results of the Global Adult Tobacco Survey in 2011 explained the most smokers in Indonesian society ranging in age from 15 years and above. Its prevalence is 67.4 percent of men and 4.5 per cent are women. For cigarettes smokers are as much as 60.9 percent of men and 2.3 percent of women. As for the number of active smokers from the age of ten years are up to 57 million men and 1.8 million women. Based RISKESDAS in 2013, the prevalence of tobacco consumption is likely to increase both in men and women. More increased prevalence in women from 1.7 per cent in 1995 to 6.7 percent in 2013. While smokers in males from 53.4 percent in 1995 increased to 66 percent in 2013.

Still based on the data RISKESDAS 2013, the average consumption of cigarettes is 10.5 cigarettes per day. For male smokers spent 10.7 cigarettes per day and 5.4 stems for female smokers. The prevalence of tobacco consumption is likely to increase, both in men and women. However, the increases in prevalence are more in women from 1.7 per cent in 1995 to 6.7 percent in 2013. While in men are from 53.4 percent in 1995 to 66 percent in 2013. The number of smokers active aged 10 years and over Indonesia are 56,860,457 men and 1,890,135 women. In the executive summary of the results RISKESDAS 2013, explained that the light of the behavior of people 15 years and older smoke is increasing from 2007 to 2013. In 2007, the number of people 15 years and older smokers in Indonesia increased to reach 34.2 and 36.3 % of 2013. When you look at the composition of fact over 64.9 % of men and 2.1% women Indonesian people still smoke cigarettes in 2013.

Further, smoking is not giving benefits to the user. Many diseases are caused by smoking, which include lung cancer, chronic respiratory, cardiovascular, cancer of the mouth and throat, pancreas, blood, kidney, cervical cancer, gastric cancer. Not only attacking the smoker, but also attack people around the smoker as inhaled cigarette smoke (second-hand smoke). The concentration of harmful substances in the body of larger passive smokers because toxins are inhaled through the cigarette smoke of active smokers is not filtered. While the cigarette toxins in the body active smokers filtered through the end of the cigarettes smoked (WHO, 2008).

That why, Anti-smoking policies in Indonesia are quite advanced. The tobacco industry is required to label packages with warnings about the health consequences of smoking, and there are laws prohibiting smoking in collective and indoor environments. Direct and indirect merchandising and sponsorship by the tobacco industry are also prohibited (Centers for Disease Control and Prevention (CDC, 2013). However, the industry continues

to employ strategies such as adding flavors to conventional cigarettes to change the taste and smell, in order to recruit new smokers from among women and adolescents. It should be borne in mind that flavored cigarettes and alternative forms of tobacco deliver all of the chemicals found in conventional cigarettes, and the prevalence of the use of such products remains unknown.

The study and analysis of pregnant women and smoking, as well as of the characteristics of nicotine addiction and its adverse health consequences, are fundamental to developing tools for the prevention and treatment of smoking in this population. There have been few studies evaluating knowledge of the hazards of smoking among pregnant women in world, such as Horta BL, Victora CG, Barros FC, dos Santos Ida S, Menezes AM (1997) and Zhang L, González-Chica DA, Cesar JA, Mendoza-Sassi RA, Beskow B, Larentis N, et al (2011) and none have evaluated technology preferences with the objective of designing interventions targeting such women. Therefore, the main objective of the present study was to examine the pattern of tobacco use and knowledge about tobacco-related diseases, as well as to identify the preferred forms of electronic media, in pregnant women, in order to improve strategies for promoting smoking prevention and cessation among such women.

2. Methods

2.1 Subjects

Between January and July of 2015, we recruited 100 whom available are 61 pregnant women from among those attending routine appointments at the public prenatal care clinic of a hospital and at primary care clinics in the city of Surabaya - East Java, Indonesia. All participants (or their parents or legal guardians) gave written informed consent.

2.2 Study design and procedures

This was a descriptive cross-sectional study. The only exclusion criterion was refusal to participate. An investigator approached each pregnant woman while she was waiting to be seen and explained the aims of the study. The investigator was not a member of the health care team responsible for the treatment of the women recruited and visited the site only to conduct the interviews. All of the women invited agreed to participate and were directed to a room to be interviewed, in order to complete the study questionnaires. The interviews were conducted face-to-face, the investigator using a questionnaire developed specifically for the present study. The pregnant women freely answered questions about active and passive smoking, smoking habits during social activities, consumption of alcohol, use of alternative forms of smoking, and knowledge about the health hazards of smoking in general, as well as about the adverse health consequences of smoking during pregnancy, not only for the mother but also for the fetus and the newborn infant.

2.2 Statistical analyses

We used the chi-square test to compare the proportions and ANOVA with Tukey's test to compare means. Both evaluations were performed with a power of 80% and a level of significance of 5%.

3. Result and Discussion

3.1. Results

Of the 61 pregnant women evaluated, 25 (40.9%) were smokers (mean age, 26.4 ± 7.4 years), 24 (39.3%) were former smokers (26.4 ± 8.3 years), and 12 (19.8%) were never-smokers (25.1 ± 7.2 years). The main characteristics of those three groups are presented in [Table 1](#). Most of the women were married and were smokers or former smokers. Only 7 women (11.5%) were over 36 years of age. The predominant level of education was ≤ 9 years of schooling. Most of the women interviewed reported having been exposed to passive smoking, the prevalence of such exposure being highest among the smokers and never-smokers. Of the 25 smokers, 12 (49.2%) reported that their husband smoked, and 4 (14.7%) reported that at least one member of the household smoked. Abortion due to fetal malformation was reported only by women who were smokers or former smokers. Of the 18 women (29.7%) who had husbands who did not smoke, 10 (54.5%) were former smokers.

Among the 49 pregnant women who were smokers or former smokers, the age at smoking initiation ranged from 9 years to 25 years. Of the 8 women (16.3%) who had started smoking by 12 years of age, 7 (87.5%) were current smokers ($p = 0.023$). In contrast, we found no association between the age at smoking initiation and current smoking among the women who had started smoking after 12 years of age. The proportion of women reporting wheezing was higher among the smokers than among the former smokers and never-smokers (87.5% vs. 12.5% and 0%, respectively; $p = 0.030$). In addition, a history of hypertension was observed only among the smokers and former smokers, of whom 14 (55.5%) and 11 (44.5%), respectively, reported having received such a diagnosis. Among women whose HADS scores were suggestive of anxiety or depression ([Table 2](#)), the majority were smokers. Five (18.4%) of the 25 smokers reported that they continued to smoke because of anxiety, whereas 3 (12.2%) reported smoking for pleasure.

Table 1 - Characteristics of the 61 pregnant women evaluated.

Variable	Smokers	Former smokers	Never-smokers
N (% of the sample as a whole)	25 (40.9)	24 (39.3)	12 (19.8)
Mean age (years), mean \pm SD	26.4 \pm 7.4	26.4 \pm 8.3	25.1 \pm 7.2
Married, n (%)	16 (64.0)	13 (54.2)	7 (58.3)
Level of education (years of schooling), n (%)			
≤ 9	14 (56.0)	10 (41.7)	4 (33.3)
10-12	8 (32.0)	9 (37.5)	7 (58.3)
> 12	3 (12.0)	5 (20.8)	1 (8.4)
Passive smoking, n (%)	18 (72.0)	11 (45.8)*	10 (83.3)
History of abortion, n (%)	5 (20.0)	7 (29.2)	4 (33.3)
Abortion due to fetal malformation, n (%)	3 (12.0)	2 (8.3)	0 (0.0)

* p = 0.049 vs. smokers and never-smokers.

Table 2 - Levels of anxiety and depression among pregnant women, according to the Hospital Anxiety and Depression Scale scores, by smoking status.

Variable	Total (n = 61)	Smokers (n = 25)	Former smokers (n = 24)	Never-smokers (n = 12)
Anxiety, n (%)				
Possible ^a	11 (18.0)	5 (20.0)	5 (20.8)	1 (8.3)
Probable ^b	13 (21.3)	7 (28.0)	2 (8.3)	4 (33.3)
Depression, n (%)				
Possible ^a	8 (13.1)	3 (12.0)	2 (8.3)	2 (16.7)
Probable ^b	5 (8.2)	4 (16.0)	0 (0.0)	1 (8.3)

^aHospital Anxiety and Depression Scale score of 8-10.

^bHospital Anxiety and Depression Scale score of 11-21.

Our findings related to how much knowledge pregnant women possess about the adverse health consequences of smoking were disappointing (Table 3). Most of the pregnant smokers and former smokers were unaware of the hazards that smoking poses to fetuses and newborn infants, as well as of tobacco-related diseases in general.

Table 3 - Knowledge of and beliefs about the health consequences of smoking for maternal, fetal, and neonatal outcomes, on the part of pregnant smokers and former smokers.

Variable	Smokers (n = 25)	Former smokers (n = 24)
Maternal health		
Lung disease, n (%)	6 (24.0)	7 (29.2)
Abortion/placental damage, n (%)	2 (8.0)	6 (25.0)
Cardiovascular disease, n (%)	1 (4.0)	1 (4.2)
Cancer, n (%)	1 (4.0)	0 (0.0)
No problems, n (%)	15 (60.0)	10 (40.6)
Fetal/neonatal health		
Lung disease (%)	9 (36.0)	5 (20.8)
Gestational problems,* n (%)	6 (24.0)	6 (25.0)
No harm to the fetus/neonate	10 (40.0)	13 (54.2)

*Pre-maturity, malformation, or low birth weight.

Regarding the motivational stage of change, we found that the proportion of smokers in the pre-contemplative stage was higher than was that of those in the contemplative stage (68% vs. 32%; p = 0.024). According to the results of the Fagerström Test for Nicotine Dependence, 15 (60%) of the smokers and 14 (58.3%) of the former

smokers had a low degree of nicotine dependence. However, 12 (49%) of the smokers cited nicotine dependence as the main motivator for their continued smoking. We identified a reduction in smoking during pregnancy, in comparison with smoking before pregnancy (Figure 1). Of the 49 women with a history of smoking, 38 (77.5%) reported an increased desire to quit during pregnancy. Of the 24 former smokers, 12 (50%) reported that they had stopped smoking because they were pregnant. It is of note that 38 (77.5%) of the women with a history of smoking did not know that smoking cessation treatments were available, and that 40 (65%) of the women interviewed expressed a desire to have more knowledge about the adverse health consequences of smoking. Alcohol consumption during pregnancy was reported by a considerable proportion of the women with a history of smoking (42.9%), and most (85.7%) of those women reported an increase in cigarette consumption when drinking.

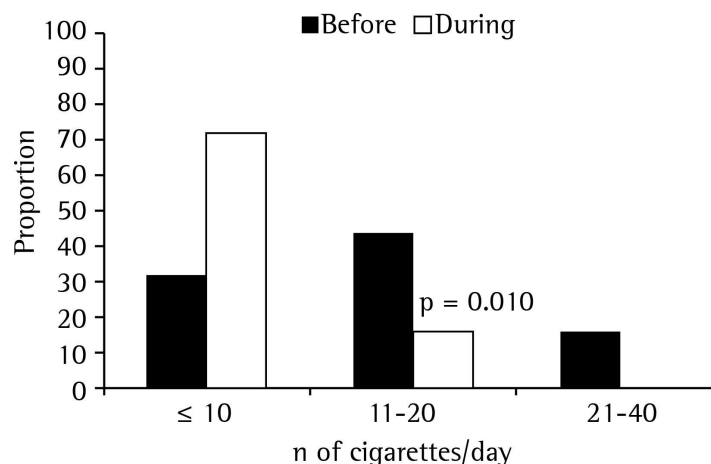


Figure 1 - Daily consumption of cigarettes before and during pregnancy among expectant mothers in the city of Surabaya - East Java, Indonesia (n = 49).

In our sample, the electronic media available to pregnant women are included video players (in 36.1%), radio (in 62.3%), and television (in 85.2%). Television was also the medium most preferred for relaxation/enjoyment (by 49.2%). Internet use was still somewhat limited in this population, being cited by only 21 (34.4%) of the 61 women interviewed.

3.2 Discussion

The main findings of the present study were that, among the pregnant women evaluated, there was a high prevalence of active and passive smoking during pregnancy; considerable usage of alternative forms of tobacco consumption during pregnancy; high levels of alcohol consumption during pregnancy; and limited knowledge of the adverse health consequences of smoking, including pregnancy outcomes for the fetus and newborn infant. On the basis of the preferences expressed by the interviewees, television appears to be the medium most well suited to delivering educational materials to this population (pregnant women).

We found a high (40.9%) prevalence of active smoking among pregnant women, and 72% of the pregnant smokers also reported being exposed to secondhand smoke during pregnancy. The prevalence of active smoking was higher than the 19.2-23.3% reported in the national and international literature (Floyd RL, Zahniser SC, Gunter EP, Kendrick JS, 1991). It should be borne in mind that this study was not designed to determine the prevalence of smoking among pregnant women in general. In fact, some of the participants were recruited from a university hospital with a prenatal outpatient clinic primarily targeting women with high-risk pregnancies, which can be associated with other disorders that predispose to increased smoking. To our knowledge, there have been no previous studies evaluating the prevalence of smoking in this subgroup of pregnant women. However, this could explain, at least in part, the high prevalence of current smoking in our study sample and indicates the need to develop prevalence studies and offer individualized smoking cessation programs at such clinics.

Our results show that a high proportion of pregnant former smokers lived with a never-smoker husband, which is consistent with the findings of previous studies showing a tendency for pregnant women to stop smoking if they have a husband who has never smoked (Rore C, Brace V, Danielian P, Williams D, 2008). In addition, according to data in the literature and from the present study, pregnancy promotes smoking cessation, and that window of opportunity is not being taken advantage of, as evidenced by the fact that 77.5% of the smokers and former smokers interviewed in our study did not know that smoking cessation treatment was available. Furthermore, at least two studies have reported that mothers feel guilty about smoking during pregnancy (Possato M, Parada CM, Tonete VL, 2007). Therefore, a carefully presented appeal to consider smoking cessation treatment before

or during pregnancy could be an effective strategy targeting this population of women.

We found that a high proportion of the pregnant women interviewed smoked flavored cigarettes or consumed tobacco in other alternative forms. The prevalence of those forms of tobacco consumption among pregnant women in Indonesia remains unknown. Like traditional (cigarette) smoking, alternative forms of tobacco consumption have adverse health consequences (Healton CG, Beck SE, Cartwright J, Vallone DM, 2010). Therefore, smoking cessation interventions should include information about alternative forms of tobacco use, and that information needs to be widely disseminated.

Of the pregnant women interviewed in the present study, fewer than 30% were aware of the effects that smoking has on respiratory health, and a similar proportion knew that smoking during pregnancy could lead to spontaneous abortion or damage the placenta. The consequences of maternal smoking for the fetus and newborn infant, such as pre-maturity, malformation, and low birth weight, were also known by only approximately 30% of the participants. Unfortunately, 40% of the smokers and 54.2% of the former smokers believed that smoking did not cause harm to the fetus or newborn infant. In addition, fewer than 6% of the women we interviewed were aware of the fact that smoking is associated with cardiovascular disease and cancer. These findings are consistent with those of studies showing that pregnant women possess only superficial knowledge of the health consequences of smoking during pregnancy (Possato M, Parada CM, Tonete VL, 2007).

We found that the pregnant women evaluated in the present study presented with certain risk factors for smoking (Rore C, Brace V, Danielian P, Williams D, 2008). The majority had a low level of formal education, and alcohol consumption during pregnancy was common (reported by 42.9%). Freire et al. (2009)¹ also identified alcohol consumption during pregnancy in 31.3% of the pregnant smokers they evaluated. Similarly, Kroef et al. (2004) showed that, among pregnant women, smokers and former smokers consumed more alcohol than did never-smokers. In the present study, 39.3% of the pregnant women evaluated had scores of the HADS that were suggestive of anxiety and 21.3% had HADS scores suggestive of depression. Anxiety disorders are common during pregnancy (Lumley J, Chamberlain C, Dowswell T, Oliver S, Oakley L, Watson L., 2009; and Reichert J, Araújo AJ, Gonçalves CM, Godoy I, Chatkin JM, Sales MP, et al., 2008), and depression has been associated with difficulty in quitting smoking among women, a situation that can be compounded by pregnancy. Park et al (2009). and Solomon et al. (2007) both demonstrated that, in women who spontaneously stopped smoking during pregnancy, there was a positive association between depressive symptoms at the end of pregnancy and relapse to smoking in the postpartum period.

Among the pregnant women evaluated in the present study, television, the internet, and radio were the most widely used forms of electronic media, television being the form preferred by the largest proportion of the participants. Studies have shown that sending text messages (via mobile phone) advising pregnant women to quit smoking is an effective way to encourage smoking cessation during pregnancy, as is promoting interaction among pregnant smokers via online social networks (Fujioka N, Kobayashi T, Turale S., 2012; and Lowe JB, Barnes M, Teo C, Sutherns S. 2012). However, Bot et al. (2009) evaluated the differences in internet usage by pregnant women with different levels of education and found that those who had a low level of education were less interested in receiving e-mails about health issues than were those who had a higher level of education. In view of our finding that 65% of the pregnant smokers in the present study expressed a desire to increase their knowledge of the health consequences of smoking, we believe that educational interventions might be beneficial to these smokers.

4. Conclusion

In conclusion, the results of our study indicate that there is a high prevalence of active and passive smoking among pregnant women and that such women have limited knowledge about the health consequences of smoking, during pregnancy and otherwise. Pregnancy provides a window of opportunity for promoting smoking cessation and should be viewed as an excellent opportunity to provide more information about the health hazards of smoking and to offer smoking cessation treatment to pregnant women. Educational programs that include information about the consequences of all forms of tobacco use, employing new and effective formats tailored to this particular population, should be developed. Despite large-scale media campaigns, the level of knowledge among pregnant women regarding the long-term consequences of tobacco use remains low, and the use of alternative forms of tobacco is high among such women. However, pregnant women expressed interest in learning more about the subject, and television might be a useful tool for delivering information to this population in an attractive and continuous manner.

Potential limitations of the present study include the small sample size and the fact that it was conducted in only one city. In addition, the study sample comprised high-risk pregnant women. Therefore, the results cannot be extrapolated to pregnant women in general or to other regions of Indonesia. However, because all of the women invited to participate in the study agreed to be included, there was no selection bias.

We believe that our study has added to the body of information supporting the development and implementation of new tools to improve the treatment of smoking during pregnancy. The use of material tailored to pregnant

smokers and delivered in the form of videos shown or distributed to pregnant women during prenatal visits to outpatient clinics might promote smoking prevention and cessation among such women.

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