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# Self-efficacy and perceived barriers of pregnant women regarding exposure to second-hand smoke at home

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## Abstract:

**BACKGROUND AND AIM:** The inability of women to demand from their husbands, for not smoking, has been reported as a factor in exposure to cigarette smoke. This study aimed to investigate the perceived barriers and self-efficacy of pregnant women regarding second-hand smoke (SHS) at home.

**MATERIALS AND METHODS:** This was a cross-sectional study, and the sample size was 255 pregnant women who visited the health-care centers in Isfahan, Iran, from July 2018 to September 2018, and were selected randomly and voluntarily. A questionnaire was designed to collect the data about the exposure to smoke, perceived barriers, and self-efficacy. The data were analyzed using descriptive statistics (mean score and standard deviation), inferential statistics (nonparametric Mann–Whitney and Kendall test), and Spearman’s correlation and regression.

**RESULTS:** The mean score of self-efficacy in the exposure group was lower than that the other group ( $P = 0.000$ ). The mean score of perceived barrier was not a significant difference ( $P = 0.449$ ). Personal perceived barriers are the most important predictor of self-efficacy of pregnant women in exposure to SHS (95% confidence interval: 0.013–0.262) ( $P = 0.030$ ). Kendall test comparing items within the group and Mann–Whitney test comparing the two groups showed that personal factors such as “Unaware of the dangers of SHS and protective measures” for notexposed women and environmental factor “the lack of ban smoking law at home” for exposed women are considered the most important barriers ( $P = 0.000$ ). “Not being together a husband” ( $P = 0.293$ ) and “going to another place when smoking a husband” ( $P = 0.000$ ) are the highest self-efficacy items.

**CONCLUSIONS:** It is necessary to develop training programs to increase self-efficacy to avoid exposure to SHS and for both pregnant women and their husbands. It is also necessary to educate and inform about SHS and protective measures against it and to set up “smoking ban law” at home in our country to protect pregnant women.

## Keywords:

Perceived barriers, pregnant women, second-hand smoke, self-efficacy

## Introduction

Nonsmokers are exposed to health hazards by breathing SHS of the smokers’ cigarettes.<sup>[1]</sup> More than 35% of nonsmoking women in the world<sup>[2]</sup> and more than half (56.2%) of pregnant women in Iran are exposed to second-hand cigarette smoke.<sup>[3]</sup> The exposure to SHS causes

several severe complications in pregnant women such as preterm labor,<sup>[3]</sup> rupture of membranes,<sup>[4]</sup> increased possibility of cesarean operation,<sup>[5]</sup> decreased growth of fetus, delayed intrauterine growth,<sup>[6,7]</sup> low birth weight of fetus,<sup>[6-9]</sup> and distressed fetus.<sup>[8,9]</sup> Some of the causes of exposure to cigarette smoke are mentioned in various studies, such as low levels of education and unemployment;<sup>[5]</sup> the inability of women at the request of their husbands to stop

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smoking;<sup>[10]</sup> the presence of a tobacco user in a family member;<sup>[3]</sup> misconceptions of pregnant women about the impact of exposure to tobacco smoke on the health of the fetus;<sup>[3]</sup> and low self-efficacy, smoker guest, and misconceptions.<sup>[11]</sup> Evaluation of exposure to cigarette smoke during pregnancy was an important part of prenatal care.<sup>[9]</sup> Hu *et al.* on second-hand smoke (SHS) interventions for pregnant women showed that increased self-efficacy of women was effective in stopping smokers other than husbands.<sup>[12]</sup> In a study by Nichter *et al.*, the inability of women to demand from their husbands, for not smoking, has been reported as a factor in exposure to cigarette smoke.<sup>[10]</sup> Perceived barriers prevent action, and self-efficacy is the individual's ability to change behavior.<sup>[13]</sup> The patriarchy and inability of women to resist against their husband to avoid smoking were reported by Mao's study.<sup>[14]</sup> There are studies that show the factors associated with the exposure of pregnant women to SHS,<sup>[3,5,10]</sup> but to the best of our knowledge, there was no study on the barriers that pregnant women face or the factors affecting their self-efficacy. Determination of the perceived barriers and self-efficacy of pregnant women about SHS exposure can help us identify the opportunities to reduce the inadequacies of health programs. The results of this study can help the authorities design and implement future educational interventions. This study aimed to investigate the perceived barriers and self-efficacy of pregnant women regarding SHS at home.

## Materials and Methods

In this cross-sectional study, we included 255 pregnant women who referred to the health centers in Isfahan from July to September 2018. The random sampling was conducted using the participants' national codes registered in the electronic system of health centers by considering the maximum variation. Sample size calculation was based on the same study:<sup>[3]</sup> confidence level 95%,  $P = 60\%$ , and error of estimate 6%. Considering the inclusion criterion, all the married and pregnant women in all age groups were selected. The exclusion criteria included the participants' unwillingness to participate in the research and active smoker women. After explaining the goals of the study, individuals were asked to complete informed consent form and the questionnaire, if they had a willingness and informed consent to participate in the study.

To collect the required information, we used a questionnaire which was designed by the research team, based on the personal and environmental perceived barrier and self-efficacy. The questionnaire used was self-administered.

The first section of the questionnaire included the participants' demographic information: the participants' age, the occupation of women, and the level of education of women. The second section of the questionnaire (seven questions on personal barrier and five questions on environmental barrier) included barriers such as the lack of awareness of pregnant women and smoker men about the complications of smoke, low education of men, and unemployment. The third section of the questionnaire included the self-efficacy questions (6 questions) regarding the ability of women to protect themselves from smoke which included items such as (The pregnant woman can go elsewhere, when her husband smokes. The pregnant woman can ask her husband to not smoke at home). The items were answered on a 5-point Likert scale using the options of "completely disagree (1 score), disagree (2 scores), no idea (3 scores), agree (4 scores), and completely agree (5 scores)."

The context and visual validity of tools were measured by expert's panel comments (the panel of experts included eight professionals from health education, one expert from the health promotion field, five professionals from the reproductive health, and one expert from the field of psychology). The content and visual validity of the questionnaire was measured using Content Validity Ratio (CVR) $>0.49$ , Content Validity Index (CVI) $>0.79$ , and They were confirmed by CVR = 0.6 and CVI = 0.81. The reliability was calculated based on internal consistency. The Cronbach's alpha for perceived barriers and self-efficacy was 0.89 and 0.74, respectively.

The data were analyzed using SPSS version 18.0 (SPSS, Inc. Chicago, IL) and using descriptive statistics (mean score and standard deviation), inferential statistics (non-parametric Mann-Whitney and Kendall test), and Spearman's correlation and regression (the data was not normal).

This study is a part of a Ph.D. thesis in health Education with ethical code IR.SSU.SPH.REC.1396.133. All the data were confidential, and the results were reported to participants, the oral consent was obtained from all participants.

## Results

A total of 255 pregnant women with an average age of  $29.63 \pm 7.87$  years participated in this study. The level of education of pregnant women was read and write in 47 women (18.4%), no academic education in 109 women (42.2%), and academic education in 123 women (48.2%). Most of the pregnant women were homemakers (219 [58.9%]) and others were employed (36 [14.1%]).

The mean score of self-efficacy ( $P = 0.000$ ) showed significant difference. The mean score in the exposure group was lower than that of the other groups. The mean score of perceived barriers was not significantly different between the two groups ( $P = 0.449$ ) [Table 1].

Spearman’s correlation was used to examine the correlation between personal and environmental perceived barriers and perceived self-efficacy. Results showed that there was a positive and significant correlation between personal perceived barriers and self-efficacy ( $P = 0.002$ ,  $r = 0.195$ ). However, there was no significant correlation between environmental perceived barriers and self-efficacy ( $P = 0.076$ ,  $r = 0.111$ )

In addition, the results of the regression test in Table 2 showed that personal perceived barriers are the most important predictor of self-efficacy of pregnant women

**Table 1: The Comparison of mean score of structures based on exposure of pregnant women with cigarette smoke**

Structures	Exposed to cigarette smoke	Mean±SD	P Mann-Whitney test
Self-efficacy	Yes	19.55±5.72	0.000*
	No	24.44±4.15	
	Total	23.31±4.99	

\*The significance level<0.05. SD=Standard deviation

**Table 2: The summary regression linear of predictive barrier of self-efficacy**

barrier	Perceived self-efficacy			
	Significant	Exp (B)	R <sup>2</sup>	CI
Personal	0.030*	0.143	0.168	0.013-0.262
Environmental	0.269	0.073	0.121	-0.057-0.205

\*The significance level<0.05. CI=Confidence interval

in exposure to SHS (confidence interval: 0.013–0.262) ( $P = 0.030$ ).

Kendall’s test was used to compare perceived barriers in the group. The results showed that the mean score of the questions within the exposed and notexposed group was statistically significantly different ( $P = 0.000$ ), and item 12 in the exposed group and item 4 in the unexposed group had the highest mean score. The Mann–Whitney test was used to compare the two groups, three items of personal barriers (items 3, 4, and 5) “The lack of knowledge of men about the complications of SHS”, “The lack of knowledge of women about the complications of SHS” and “The lack of knowledge of women about how to protect themselves from SHS” with the highest mean score in the non-exposed group was significantly higher than the exposed group ( $P < 0.05$ ). In environmental perceived barriers, item (12), “the lack of ban smoking law at home” with the highest mean score in the exposed group, was significantly higher than the non-exposed group ( $P < 0.05$ ). Therefore notexposed women and exposed women are considered the most important barrier, personal factors “Unaware of the dangers of SHS and protective measures” and, environmental factor “the Lack of ban smoking law at home” respectively [Table 3].

Kendall’s test was used to compare intragroup perceived self-efficacy questions. The mean score of self-efficacy questions in the exposed group did not have a significant difference, although item 1 had the highest mean score ( $P = 0.293$ ). The mean score of questions in the notexposed group was significantly different, and item 6 had the highest mean score ( $P = 0.000$ ). Therefore, “not being together a husband” and “going to another place when smoking a husband” are the highest self-efficacy items. Comparing the two groups with the Mann-Whitney test, the mean score of all self-efficacy

**Table 3: The mean score of items of perceived barriers of pregnant women who were exposed to smoke**

Perceived barriers questions for exposed to smoke	Mean±SD		P Mann-Whitney test
	Notexposure	Exposure	
The man’s lower education causes his wife to exposure to SHS at home	3.14±1.46	3.42±1.11	0.263
The man’s unemployment makes him more likely to be at home and his wife to exposure to SHS at home	3.73±1.20	3.57±0.98	0.137
Pregnant women are unaware of the effects of SHS on pregnancy and fetus	3.75±1.15	3.45±1.02	0.034*
Smoker men are unaware of the effects of SHS on pregnancy and fetus	4.04±1.09	3.76±0.81	0.004*
Pregnant women do not know how to protect against SHS	4.01±0.95	3.66±0.92	0.004*
Most smokers do not care about their pregnant wife’s health	3.63±1.19	3.54±1.02	0.342
The patriarchal culture has led men to smoke around their pregnant wife	3.50±1.17	3.54±1.03	0.951
Not having a balcony or a yard will cause men to smoke at home	3.06±1.31	3.22±1.08	0.377
Not having a place to smoke will cause smoking at home	2.97±1.29	3.11±1.08	0.342
Smoker guests cause smoking men at home	3.51±1.21	3.25±1.09	0.074
Because pregnant women are not allowed to determine what kind of behavior a smoker men should do, men smoke at home	3.28±1.23	3.57±1.13	0.113
The lack of “Ban smoking law” at home causes men to smoke at home	3.42±1.27	3.81±1.14	0.050*
P value of Kendall’s test	0.000*	0.000*	-

SD=Standard deviation, SHS=Second-hand smoke, \*The significance level<0.05

**Table 4: The mean score of items of perceived self-efficacy of pregnant women who were exposed to smoke**  
Perceived self-efficacy questions for exposed to smoke

Perceived self-efficacy questions for exposed to smoke	Mean±SD		P
	Nonexposure	Exposure	Mann-Whitney test
A pregnant woman can, when her husband smoke, is not around him	3.85±1.00	3.42±1.14	0.010*
A pregnant woman can ask her husband to not smoke at home or car, even if it provokes debate	4.02±0.94	3.18±1.13	0.000*
A pregnant woman can ask her husband to not smoke at home or car, even if she is afraid of him	4.11±0.96	3.15±1.20	0.000*
A pregnant woman can protect herself from SHS	3.96±1.04	3.33±1.09	0.000*
A pregnant woman can ask her husband to not smoke, even with the relaxation caused by smoking in her husband	4.22±0.89	3.11±1.19	0.000*
A pregnant woman can go elsewhere when smoking her husband	4.26±0.79	3.33±1.19	0.000*
P value of Kendall's test	0.000*	0.293	-

SD=Standard deviation, SHS=Second-hand smoke, \*The significance level<0.05

questions in the non-exposed group was significantly more than the exposed group ( $P = 0.000$ ) [Table 4].

## Discussion

This study aimed to determine the self-efficacy and perceived barriers of pregnant women regarding exposure to SHS at home. The results showed that the mean score of self-efficacy of pregnant women exposed to SHS was lower than those who are not exposed.

In the study of Baheiraei *et al.*, the belief of pregnant women about the impact of exposure to tobacco smoke on fetal health was one of the important factors associated with smoking restrictions at home.<sup>[3]</sup> In the study of Ma *et al.*, most nonsmokers exposed to passive smoking felt that it is impolite to ask smokers to not smoke in indoor places.<sup>[15]</sup> In the study of Lee, on the intervention for pregnant women toward SHS, the results showed that most pregnant women had a disability and lack of self-efficacy against smokers.<sup>[16]</sup> Hu *et al.* on SHS interventions for pregnant women showed that increasing self-efficacy is effective in stopping smokers in their homes.<sup>[12]</sup> In a study by Nichter *et al.*, the inability of women to demand from their husbands, for not smoking, has been reported as a factor in exposure to cigarette smoke.<sup>[10]</sup> In the study by Zheng *et al.*, high self-efficacy was associated with low exposure to SHS at home and the presence smoker guest at home and the false impression of women about protective strategies against SHS were reported as a factor in exposure to smoke.<sup>[2]</sup>

The results of this study are consistent with results of studies. Low self-efficacy of pregnant women in their exposure to SHS is an important factor. Therefore, training should be provided in order to protect pregnant women against SHS and the empowering to demand them from their husbands who do not smoke at home and near them.

According to the results, personal perceived barriers are the most important predictor of self-efficacy of pregnant women in exposure to SHS. "The lack of knowledge of

men and women about the complications of SHS" and "The lack of knowledge of women about how to protect themselves from SHS" are considered the most important personal barriers.

Various studies consistent with the present study indicated that lack of knowledge about the complications of SHS and protective measures are factors of exposure to SHS. Passey *et al.* indicated that lack of knowledge and awareness acted as a barrier to avoid SHS exposure.<sup>[17]</sup> Knowing the hazards of the SHS motivated them for changing the condition and improving their health care.<sup>[17]</sup> Yang *et al.* carried out a study in China and reported that rural women who were not provided with enough knowledge about SHS had high rates of exposure.<sup>[18]</sup> In another study, the lack of knowledge about SHS exposure complications on family members and fetus was considered as an important risk factor for the exposure rate.<sup>[15,19,20]</sup> Pregnant women should learn the avoidance skills against indoor cigarette smoking.<sup>[21]</sup> Therefore, due to the fact that the lack of knowledge about SHS is the most important barrier, it is necessary to prepare and develop necessary training in this regard.

"The lack of ban smoking law at home" was considered the most important environmental barrier. "Not being together a husband" and "going to another place when smoking a husband" are the highest self-efficacy items.

According to Yang *et al.*, 54.4% of pregnant women did not restrict their husband's cigarette smoking at home.<sup>[18]</sup> Aurrekoetxea *et al.* indicated that ban on smoking in public places is an important resource for reducing exposure to SHS, but did not affect for reducing exposure to SHS the home.<sup>[22]</sup> In the study of Ma *et al.*, One strategy was to encourage non-smokers to enjoy clean air and to demand smokers to not smoke in a public place.<sup>[15]</sup> Kazemi *et al.* indicated that women cannot surmount the barrier to the creation of smoke-free environment creation policies at home; these findings may be related to a perceived or real lack of empowerment in our study population for enforcement of smoke-free environment creation



policies in their homes.<sup>[21]</sup> The “Ban smoking law” in the United Kingdom was associated with a reduction in perinatal clinical complications, such as stillbirths, low birth weight, and fetal and infant mortality.<sup>[23]</sup> To reduce the damage to the fetus, pregnant women should not be exposed to cigarette smoke. Each law introduced in this regard should be accompanied by training programs that emphasize the damage to the fetus.<sup>[24]</sup> Despite women concerned about the unfavorable effect of cigarette for family members, they preferred the smoker husband that stay in the house to keep the life condition.<sup>[25]</sup> The patriarchy and inability of women to resist against their husband to avoid smoking were reported in the study of Mao.<sup>[14]</sup> Although educational campaigns against the health consequences of smoke can enhance their health belief, future support for Iranian women in the form of empowerment may be needed.<sup>[21]</sup> The best way to protect nonsmokers is to reduce smoking, and the main source of exposure to SHS at home is smoker husbands.<sup>[26]</sup>

Hence, set up “smoking ban law” at home and strategies such as staying away from husbands during smoking can be effective in reducing the exposure of pregnant women to SHS; therefore, there should be training in this regard.

One limitation of this study was the self-reporting method of data collection; this method is affected by memory deficiencies. We suggest other researchers to conduct studies using the Cotinine index to confirm the results. The other limitation was the low participation rate and avoidance of women in talking about the smoking habits of their husbands. Despite the above limitations, this study provides guidance for health providers to promote self-efficacy in pregnant women toward SHS exposure.

## Conclusion

According to the results, self-efficacy of women exposed to cigarette smoke is lower than unexposed women. The personal factors such as “Unaware of the dangers of SHS and protective measures” and environmental factor such as “the Lack of ban smoking law at home” are considered the most important barriers. In self-efficacy questions, “Not being together a husband” and “going to another place when smoking a husband” are the highly prevalent items. Therefore, we recommend health-care providers to plan and implement educational training programs to increase self-efficacy to avoid exposure to cigarette smoke and for both pregnant women and their husbands. It is also necessary to educate and inform about SHS and protective measures against it and set up “smoking ban law” throughout the country to protect pregnant women.

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## Conflicts of interest

There are no conflicts of interest.

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