PREVALENCE OF KNOWLEDGE AND ATTITUDE ABOUT SECONDHAND SMOKE AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE AT CENTRAL WOMEN'S HOSPITAL IN MYANMAR

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Public health experts are aware of secondhand smoke (SHS) dangers, particularly for vulnerable groups like pregnant women. This study aims to describe the prevalence of SHS among pregnant women, including their knowledge, and attitude towards SHS. This study was a cross-sectional descriptive study conducted at Central Women's Hospital in the Yangon Region, Myanmar in 2022. Out of 407 participants, the prevalence of SHS exposure was 65.4%. The participants have higher levels of knowledge (74%) and attitude (87%) about SHS. Knowledge level was negatively associated with SHS exposure at home. The findings highlight the need for community guidance programs, policies, and interventions to establish smoke-free environments. It is also important to conduct behavioral interventions.

Keywords: Secondhand smoke (SHS), Knowledge, Attitude, Pregnant women, Myanmar.

I. INTRODUCTION

Smokers are not the only ones who suffer the tobacco effects; those around them are also harmed. Globally, secondhand smoke (SHS) exposure affects all age groups of non-smokers on a regular basis, resulting in nearly 600,000 fatalities from diseases caused by SHS exposure, including lung cancer, ischemic heart disease, and asthma.[1] The health effects of SHS are well known, especially for vulnerable populations like pregnant women. Public health experts said that there is no safe amount of SHS exposure and around 35% of pregnant women worldwide were harmed by SHS according to a World Health Organization (WHO) report.[2] Regarding a meta-analysis in 2014, a higher prevalence of pregnant women exposed to SHS ranged from 50% to 85%, depending on the nation.[3] According to the Demographic and Health Surveys (DHS) data analysis, SHS exposure in pregnancy ranged from 9.3% in the Dominican Republic to 82.9% in Timor-Leste.[4] The survey from China showed that about 75% of pregnant women have regular exposure to SHS through their husbands. It is a high prevalence rate of SHS exposure and important for pregnant women who live with no rules about smoking in their environment, especially at home.[5] Secondhand smoke exposure during pregnancy can significantly raise the risk of low birth weight (under 2500 g)[6] and also increase the risks for spontaneous abortion, stillbirth, ectopic pregnancy[7] preterm birth, premature rupture of membranes[8], abruptio placenta, and placenta Previa.[9]

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In Myanmar, nearly 18% of all death cases are related to tobacco usage.[10] According to a STEP survey, 46% and 24% of women were exposed to SHS at home and at work, respectively.[11] One study conducted in the Ayarwaddy Region of Myanmar stated that 16% of current smokers reported the presence of a pregnant woman in their smoking area.[12] Another study in Myanmar reported that SHS exposure at home is higher in females (57.8%) than in males (52.0%). As for the exposure at workplaces, there are 71.9% in males and 54.7% in females. About 39% of males and 13.6% of females were exposed to SHS in public areas.[13] The literature revealed the prevalence of smokers among the general population in Myanmar, however, there is a gap in knowledge regarding the prevalence of SHS among pregnant women. There are also a limited number of studies that have measured the knowledge and attitude of pregnant women regarding SHS exposure. Understanding current knowledge and attitude about SHS is crucial in order to design appropriate interventions to address this public health issue. Globally, improving knowledge and attitude is considered an effective solution to reducing SHS exposure. Therefore, this study aims to describe the prevalence of SHS among pregnant women as well as their knowledge and attitude about SHS in a selected study site in Myanmar.

II. METHODS

1. Research subjects

The study subjects were pregnant women who visited at Antenatal Care Clinic at Central Women's Hospital (CWH) during the study period. The inclusion criteria were all pregnant women who visited CWH and agreed to participate in the study. Pregnant women with mental health problems or other emergency conditions would not include in the study.

2. Methods

Study period

The study was done from January to September 2022.

Study location

Central Women's Hospital (CWH) in Yangon Region, Myanmar

Study design

This research was a cross-sectional descriptive study.

Sample size calculation

The sample size is calculated as followed using WHO sample size calculation software for estimating the infinite population proportion, applied to the prevalence of pregnant women exposed to SHS in Thailand = 0.39[14], $\alpha = 0.05$, and $d = 0.05$. The calculated sample size was 366. Non-response rate was estimated at around 10%, equal to 37. Therefore, the estimated total sample size was 403 covering the non-response rate of 10%.

Data collection technique

The participants were selected from pregnant women who visited the AN care clinic at CWH. When the participant agreed to the invitation, informed consent was obtained, and started interviewed by self-reported questionnaires. The enumerators are well-trained medical personnel and staff from the Department of Medical Research, Ministry of Health, Myanmar.

Research tools and measurement methods

We used face-to-face interview method with semi-structured questionnaire. We were attentive to how opinions have been measured in prior surveys and referenced the existing questionnaires of national surveys in Myanmar and other published research studies around the world which have been validated.

- The first section of the questionnaire included the participant's background information: socio-economic characteristics, reproductive history, and family status.

- The second section was about SHS exposure at home, at work, and in public places. It also asked about household smokers, public places where they were exposed to SHS, and the duration of exposure (day per week).

- The third section was about their knowledge and attitude towards SHS. In this section, 5 items were designed to investigate the women's knowledge about the negative effects of SHS. Women needed to answer the questions using one of the variable responses: "Yes", "No", and "I do not know". Each question that a participant was able to accurately respond to "Yes" earned them 1 point. Participants were also asked questions about their attitude on whether smoking should be allowed (1) at home, (2) at work, (3) in public places, (4) near pregnant women, and (5) the sale of tobacco products should be restricted. A 5-point Likert-type response scale (strongly agree, agree, undecided, disagree, strongly disagree) was used to answer these questions. They received 1 point for each question they correctly answered "strongly disagree or disagree" for questions 1 to 4. They also received 1 point if they answered "strongly agree or agree" for question 5.

- Cut-off points were based on the grading system used by Show K *et al*.[12] Total scores for both knowledge and attitude ranged from 0 to 5 and a higher score above the median value indicated good knowledge and attitude towards SHS.

Data analysis

Data was collected by Open Data Kit (ODK) software with the mobile tablet. The raw data were screened for data completeness and data validation. After screening, data cleaning and data analysis were done in Stata 15 software. Continuous variables were summarized in mean and standard deviation. Frequency and percentage were used to describe the prevalence of SHS among pregnant women. To find out the association of knowledge and attitude with SHS, multivariable logistic regression was used. The dependent variable for the measurement was the situation of SHS exposure, with categories of 'Exposed" or 'Not exposed'. Independent variables include Knowledge and Attitude toward SHS as described above in the third section of the questionnaire.

The strength of association was shown by the odds ratio (OR) and 95% CI. Statistical significance was detected if a p-value was less than 0.05.

3. Ethical considerations

The study was started after getting ethical approval from the Institutional Review Board of the Department of Medical Research (DMR), Myanmar (Approval Number: Ethics/DMR/2020/113). Informed consent was obtained from each participant before starting the interview. Participation in this study was voluntary and they could withdraw anytime. All the information was kept confidential and the research will be conducted in anonymity.

III. RESULTS

Table 1. Background characteristics of the participants (n = 407)

Variables			n	%
Age	18 – 25		127	31.2
	26 – 35		209	51.4
	> 35		71	17.4
Education	Illiterate/ Read & write		13	3.2
	Primary		71	17.4
	Middle		93	22.9
	High		155	38.1
	University and above		75	18.4
Occupation	Employed		118	29.0
	Unemployed		289	71.0
Live with husband			395	97.1
Locality Type	Urban		358	87.9
	Rural		49	12.0
Religion	Buddhist		325	79.9
	Others		82	20.1
Estimated monthly income (Myanmar Kyat)		Mean (SD)	353,651	278129.1
Pregnancy	Planned		232	57.0
	Unplanned		175	43.0
Antenatal care visit		Mean (SD)	4	2.5
Family members		Mean (SD)	4	2.5
Family Type	Nuclear		196	48.2
	Extended		211	51.8
Type of housing	Apartment		139	34.2
	Brick or semi-pucca		64	15.7
	Wooden		181	44.5
	Bamboo		23	5.6
Total rooms		Mean (SD)	1	1.2
Total windows		Mean (SD)	3	2.6

A total of 407 pregnant women who visited the CWH were included in this study. Table (1) shows the background characteristics of the participants. About half of the women (51%) were aged between 26 and 35 years old and most (57%) had completed high school level and above. The majority of the participants (71%) were unemployed. Nearly fourth-fifth (79%) of women are Buddhist and almost all of the participating women (97%) live with their husbands during pregnancy. About 88% of the women were living in urban areas and mainly live in wooden houses (45%). Their average monthly family income was over 300,000 Myanmar Kyats (equivalent to about 140 US dollars). About half of them (52%) live with their extended family and the mean number of the family member was 4.

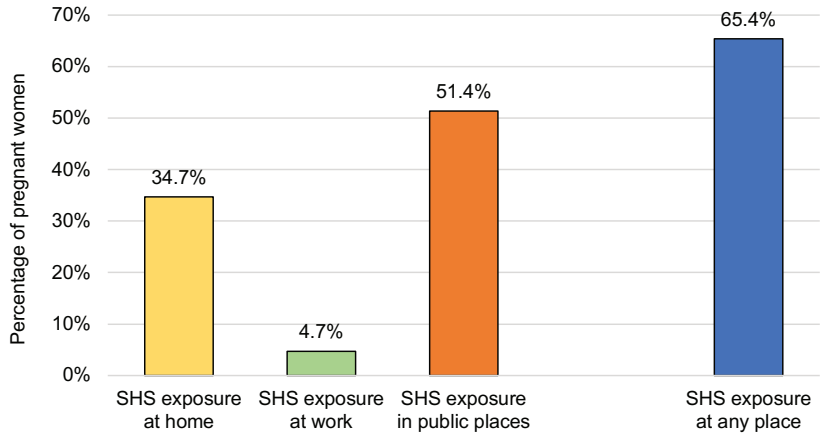

Figure 1. Prevalence of SHS exposure among pregnant women (n=407)

As seen in figure 1, about 65% of this study's pregnant women were exposed to SHS at any place during their pregnancy. Of them, nearly 51% were exposed in public places and 35% and 5% were exposed at home and at work, respectively. Restaurants were reported as the places where the highest proportion of pregnant women (52%) was exposed to SHS. Regarding indoor smokers, husbands were their primary source of SHS (57%).

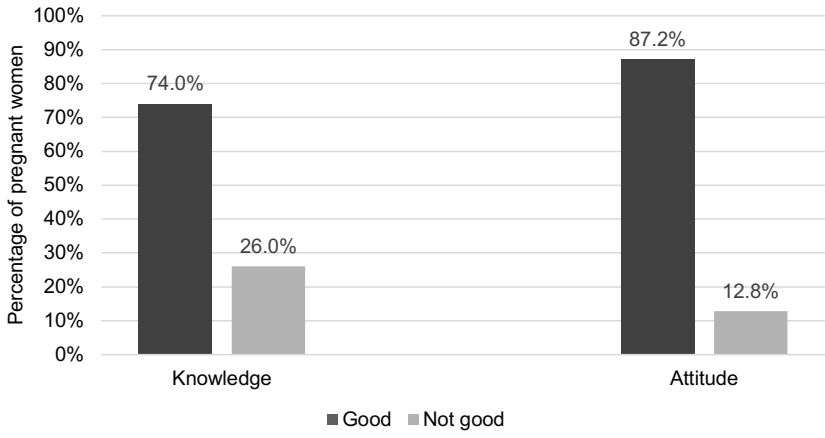

Figure 2. The proportion of participants' knowledge and attitude towards SHS

Based on the score calculated by summing up the participant's correct answers to the questions asked in the knowledge and attitude section, study participants were separated into two categories: good and not good (Figure 2). The majority of participants (74%) had good knowledge of the harmful effects of SHS exposure. Regarding the attitudes toward SHS, most of the pregnant women (87%) were against smoking being permitted at home, at work, in public places, and next to pregnant women, as well as tobacco sales.

Table 2. Association of SHS with knowledge and attitude to SHS exposure of pregnant women (at different places)

Variables	**Exposed**	**Not Exposed**	**p value**	**Exposure at home**	
	n (%)	**n (%)**		**OR (95% CI)**	**aOR (95% CI) ****
	141 (34.6)	266 (65.4)			
Knowledge			0.038		
Good	113 (37.5)	188 (62.5)		1.67 * (1.02 – 2.74)	1.78 * (1.05 – 3.02)
Not good	28 (26.4)	78 (73.6)		Ref	Ref
Attitude			0.210		
Good	127 (35.8)	228 (64.2)		1.51 (0.79 – 2.90)	1.48 (0.77 – 2.84)
Not good	14 (26.9)	38 (73.1)		Ref	Ref
Variables	**Exposed**	**Not Exposed**	**p value**	**Exposure at work**	
	n (%)	**n (%)**		**OR (95% CI)**	**aOR (95% CI) ****
	19 (4.7)	388 (95.3)			
Knowledge			0.297		
Good	16 (5.3)	285 (94.7)		1.93 (0.55 – 6.75)	1.65 (0.37 – 7.30)
Not good	3 (2.8)	103 (97.2)		Ref	Ref
Attitude			0.315		
Good	18 (5.1)	337 (94.9)		2.72 (0.36 – 20.85)	2.96 (0.38 – 22.93)
Not good	1 (1.9)	51 (98.1)		Ref	Ref
Variables	**Exposed**	**Not Exposed**	**p value**	**Exposure in public places**	
	n (%)	**n (%)**		**OR (95% CI)**	**aOR (95% CI) ****
	209 (51.3)	198 (48.7)			
Knowledge			0.317		
Good	159 (52.8)	142 (47.2)		1.25 (0.80 – 1.95)	1.28 (0.80 – 2.03)
Not good	50 (47.2)	56 (52.8)		Ref	Ref
Attitude			0.700		
Good	181 (51.0)	174 (49.0)		0.89 (0.50 – 1.60)	0.84 (0.46 – 1.51)
Not good	28 (53.8)	24 (46.2)		Ref	Ref

Variables	Exposed	Not Exposed	p value	Exposure at any place	
	n (%)	n (%)		OR (95% CI)	aOR (95% CI) **
	266 (65.4)	141 (34.6)			
Knowledge			0.310		
Good	201 (66.8)	100 (33.2)		1.27 (0.80 – 2.01)	1.28 (0.79 – 2.15)
Not good	65 (61.3)	41 (38.7)		Ref	Ref
Attitude			0.759		
Good	233 (65.6)	122 (34.4)		1.10 (0.60 – 2.01)	1.07 (0.58 – 1.97)
Not good	33 (63.5)	19 (36.5)		Ref	Ref

CI = confidence interval; OR = odds ratio; aOR = adjusted odds ratio; Ref = reference

**p < 0.05, **Multivariate models were adjusted by age, education, occupation of women, locality, religion, and antenatal care visit*

Table 2 shows the association between knowledge and attitude of pregnant women regarding SHS exposure. It was found that, in comparison to the respective referent group, pregnant women who had good knowledge of the negative effects of SHS exposure were more likely to have SHS exposure at home (aOR, 1078; 95% CI, 1.05 – 3.02). However, there was no association between the attitudes of the participants and exposure to SHS everywhere.

IV. DISCUSSION

To the best of our knowledge, this study was the first one to be carried out in Myanmar to determine the prevalence of SHS exposure in pregnant as well as their knowledge and attitude toward SHS. According to this study, 65.4% of self-reported pregnant women had SHS exposure in a variety of settings. This proportion suggests that SHS exposure is a significant health concern for pregnant women in Myanmar. The most common rate among them is exposure in public places (51.4%), followed by at home (34.7%). When compared to the Global Youth Tobacco Survey in Myanmar, which found that about 24% of girls were exposed to SHS in public areas and 29.5% at home,[15] our prevalence rates were very high. Furthermore, our findings differed from the earlier study on SHS exposure in Myanmar, which found that 14% of females were exposed to SHS in public places and 58% at home.[13] These research on Myanmar, however, were targeted at the general population and young people. A Canadian study found that when the province's smoke-free patio policy was implemented, SHS exposure in public places like restaurants was reduced to 25% relative to pre-policy SHS exposure.[16] Regarding a study conducted in Myanmar, higher levels of SHS exposure at home were associated with a lack of household smoking restrictions and a lack of awareness of the harmful effects of SHS on non-smokers.[13] Since smoking is not strictly prohibited in Myanmar, it is crucial to look into ways to reduce SHS exposure in these settings.

Moreover, to reduce the negative effects of SHS exposure in pregnant women, addressing SHS exposure from someone who smokes is a crucial step. As a result of our study, pregnant women were primarily exposed to SHS at home by their husbands (57%). It is believed that providing smokers with the right guidance on avoidance and smoking cessation can increase

their desire to make changes in their families. It is also recommended to educate and counsel husbands and other indoor smokers to raise their awareness.[4] Simple advice and education were offered to women in China, to assist in lowering their husband's smoking frequency. This successfully lowered the number of cigarettes their husbands smoked and boosted their attempts to stop smoking.[17]

In addition, our study uncovered the facts that demand further, in-depth study. We discovered that most participants had good knowledge (74%) and attitude (87%) of the risks associated with SHS exposure. However, there was an association between pregnant women who had good knowledge and SHS exposure at home. This result was consistent with the findings of the investigation into youth exposure to SHS in 168 different countries.[18] It is significant to note that even if pregnant women had good knowledge and attitude, they had less control over their capacity to avoid being around smokers and the prevalence rate was still high. As a result, awareness of the harms caused by SHS had no effect on participants' behavior. Another explanation for this finding is that SHS exposure is significantly influenced by the surrounding population's behavior and cooperation, as opposed to solely pregnant women's attitudes and efforts. Therefore, to modify a person's behavior, it is necessary to reinforce already-existing implementation programs and expand their use.

In contrast, pregnant women had a right to smoke-free environments, so it is crucial to address this as a matter of both policy and human rights in relation to the Framework Convention on Tobacco Control (WHO FCTC) approach.[19] More focus should be placed on increasing knowledge and enforcement to ensure that the regulations have the desired effects. To protect vulnerable populations and enforce smoke-free environments, public health programs should empower pregnant women as well as the general population.

The results of this study cannot be generalized to all Burmese pregnant women because it was limited to one major hospital in the Yangon Region of Myanmar. The results also depended on the participants' self-reporting, which could lead to recall bias since the individuals might not have remembered every event of SHS exposure. Self-reporting may also result in social desirability bias as women may desire to provide more socially acceptable responses and prevent a bad portrayal of themselves or their partners. The absence of qualitative data collection was another limitation of this study to understanding social, cultural, and other related factors influencing SHS exposure. Therefore, future research should explore the specific social and cultural aspects of Myanmar that may affect pregnant women's exposure to SHS.

V. CONCLUSION

Evaluation of SHS exposure and strategies for avoiding it are crucial parts of pregnancy care programs. Our findings suggest that smoke-free homes and public places should be promoted and that women should be given advice on how to keep a smoke-free environment. Furthermore, as pregnant women alone cannot prevent SHS, the community as a whole should receive health education to reduce SHS exposure during pregnancy. Although there was a high level of knowledge and attitude about SHS, there was still a high prevalence rate of SHS exposure among pregnant women. Therefore, it is important to conduct behavioral interventions and suitable training programs to help pregnant women improve their SHS avoidance abilities. Our findings can be utilized

as preliminary evidence to investigate additional SHS prevention measures for pregnant women as well as for the general community.

REFERENCES

1. Prüss-Ustün A, Öberg M, Jaakkola MS, Woodward A, Peruga A. Worldwide burden of disease from exposure to second-hand smoke: a retrospective analysis of data from 192 countries. *Lancet*. 2011; 377: 139-185. doi:10.1016/S0140.

2. World Health Organization. *WHO Report on the Global Tobacco Epidemic, 2009*.; 2009.

3. Wang M, Wang ZP, Zhang M, Zhao ZT. Maternal passive smoking during pregnancy and neural tube defects in offspring: A meta-analysis. *Arch Gynecol Obstet*. 2014; 289(3): 513-521. doi:10.1007/s00404-013-2997-3.

4. Tobacco Free Initiative (World Health Organization). *WHO Recommendations for the Prevention and Management of Tobacco Use and Second-Hand Smoke Exposure in Pregnancy*.; 2013.

5. Yang L, Tong EK, Mao Z, Hu T wei. Exposure to secondhand smoke and associated factors among non-smoking pregnant women with smoking husbands in Sichuan province, China. *Acta Obstet Gynecol Scand*. 2010; 89(4): 549-557. doi:10.3109/00016341003713851.

6. Prince P, Umman M, Fathima F, Johnson A. Secondhand smoke exposure during pregnancy and its effect on birth outcomes: Evidence from a retrospective cohort study in a tertiary care hospital in Bengaluru. *Indian Journal of Community Medicine*. 2021; 46(1): 102-106. doi:10.4103/ijcm.IJCM_464_20.

7. Hyland A, Piazza KM, Hovey KM, et al. Associations of lifetime active and passive smoking with spontaneous abortion, stillbirth and tubal ectopic pregnancy: a cross-sectional analysis of historical data from the Women's Health Initiative. Published online 2014. doi:10.1136/tobaccocontrol.

8. Eftekhar M, Pourmasumi S, Sabeti P, Mirhosseini F. *Relation of Second Hand Smoker and Effect on Pregnancy Outcome and Newborns Parameters*. Vol 2.; 2016. www.scientonline.org.

9. Ananth C v, Savitz DA, Luther ER. *Maternal Cigarette Smoking as a Risk Factor for Placental Abruption, Placenta Previa, and Uterine Bleeding in Pregnancy*. Vol 144.; 1996. http://aje.oxfordjournals.org/.

10. World Health Organization. *Tobacco Fact Sheet, Myanmar (2018)*.; 2018. http://www.searo.who.int/nts.

11. World Health Organization, Ministry of Health (Myanmar). Report on National Survey of Diabetes Mellitus and Risk Factors for Non-communicable Diseases in Myanmar (2014). Published online 2014. Accessed September 2, 2022. https://untobaccocontrol.org/impldb/wp-content/uploads/reports/myanmar_2016_annex1_2014_steps_report.pdf.

12. Show K, Phyo A, Saw S, et al. Perception of the risk of tobacco use in pregnancy and factors associated with tobacco use in rural areas of Myanmar. *Tob Prev Cessat*. 2019; 5(October). doi:10.18332/tpc/112719.

13. Sein AA, Than Htike MM, Sinha DN, Kyaing NN. Exposure to second-hand tobacco smoke among adults in Myanmar. *Indian J Cancer*. 2012; 49(4): 410-418. doi:10.4103/0019-509X.107749.

14. Ouiyanukoon P KR. *Prevalence and Related Factors of Pregnant Women Received Second Hand Smoke during Pregnancy*.; 2016.

15. World Health Organization. *Report of Fifth Global Youth Tobacco Survey (GYTS) Myanmar, 2016*.; 2016. Accessed September

2, 2022. https://apps.who.int/iris/bitstream/handle/10665/274351/9789290226567-eng.pdf?sequence=1&isAllowed=y

16. Azagba S. Effect of smoke-free patio policy of restaurants and bars on exposure to second-hand smoke. *Prev Med (Baltim)*. 2015; 76:74-78. doi:10.1016/j.ypmed.2015.04.012.

17. Loke AY, Tai HL. A randomized controlled trial of the simple advice given by obstetricians in Guangzhou, China, to non-smoking pregnant women to help their husbands quit smoking. *Patient Educ Couns*. 2005; 59(1): 31-37. doi:10.1016/j.pec.2004.08.018.

18. Veeranki SP, Mamudu HM, Zheng S, et al. Secondhand smoke exposure among never-smoking youth in 168 countries. *Journal of Adolescent Health*. 2015; 56(2): 167-173. doi:10.1016/j.jadohealth.2014.09.014.

19. Dresler C, Lando H, Schneider N, Sehgal H. Human rights-based approach to tobacco control. *Tob Control*. 2012; 21(2):208-211. doi:10.1136/tobaccocontrol-2011-050206.