



## **Prevalence of Smoking and Its Associated Factors among Indonesian Women: A Simple Literature Review and Alternative Management**

**Ekarini Daroedono<sup>a\*</sup>, Forman Erwin Siagian<sup>b</sup>, Lusya Sri Sunarti<sup>c</sup>,  
Ani Oranda Panjaitan<sup>d</sup>, Jordan Parningotan<sup>e</sup>  
and Landro Tua Tonapa Siregar<sup>e</sup>**

<sup>a</sup> Department of Community Medicine, Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia.

<sup>b</sup> Department of Parasitology and the Center of Biomedic Research, Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia.

<sup>c</sup> Department of Microbiology, Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia.

<sup>d</sup> Department of Histology, Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia.

<sup>e</sup> Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia.

### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author ED designed the study, performed the initial literature searching, and wrote the first draft of the manuscript. Author FES also designed the study and performed the initial literature searching. Authors LSS and AOP managed the analyses of the study. Authors JP and LTTS managed the whole literature searches, drafting the table and also the map. All authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/JOCAMR/2022/v19i230370

### **Open Peer Review History:**

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/91897>

**Systematic Review Article**

**Received 03 August 2022  
Accepted 13 September 2022  
Published 16 September 2022**

## **ABSTRACT**

**Aims:** To review previous electronic literature available on the internet regarding epidemiology of smoking among Indonesian women, and its associated factors with seeking for alternative management available in the internet.

**Study Design:** A simple cross sectional study by systematically review of the electronic literatures.

<sup>o</sup>Medical Student;

\*Corresponding author: E-mail: [ekarini@uki.ac.id](mailto:ekarini@uki.ac.id);

**Place and Duration of Study:** All steps in this study conducted in the Faculty of Medicine Universitas Kristen Indonesia, Jakarta Indonesia between January-July 2022.

**Methodology:** This simple literature study held by reviewing the electronic literatures regarding the topics. Data mining made available from popular scientific search engine named PubMed® and Google scholar™. Phrases of "Female Smokers in Indonesia pdf", "Risk Factors for Female Smokers in Indonesia pdf", "Prevalence smoking in Indonesia" being the keyword in searching which combined in bahasa and or English. The data collected will be entered systematically with tabulation and presentation of the map of Indonesia. Out of 106 articles gained initially, then through several stages of screening, the number reduced step by step until the remaining 15 articles to be analyzed further. All important data from all articles are presented in tabular form and then followed by an attempt to describe geographical location where the study conducted This is done by placing dots and related numbers in modified Indonesia map.

**Results:** The prevalence and characteristics of female smokers in Indonesia in time period of 2016 – 2022 were achieved in 15 articles. Methodologically, most of the study using a simple, cross sectional method (60%) presented in a table.

**Conclusion:** This literature study discusses the prevalence and risk factors of female smokers in Indonesia. Smoking is still a common health problem that causes death on a large scale in the world, especially in the vulnerable group like women. Many internal and social factor affect this practice among women. By teaching them properly about the future risk of smoking and support them actively to quit smoking; this approach will save her future and her descendant. Yoga and or other alternative approach might be an alternative for those who want to quit smoking.

*Keywords: Spous; addiction; stigma; discrimination; cancer; support; yoga; meditation; complimentary.*

## 1. INTRODUCTION

Smoking is the act of inhaling and exhaling the gas of burning plant material, most commonly related with tobacco in the form of a cigarette, cigar, or pipe and sometime also with substances that are prohibited in some countries such as marijuana and hashish [1]. Smoking is associated with many health problems, directly or indirectly depend on its chronicity of consumption, and what can be called the most severe effect is respiratory cancer which risk among smoker is 2 to 10 times higher than a non-smoking individual [2]. Smoking also responsible for the occurrence of numerous non communicable diseases, serious long-term disability and sudden death, globally [1,2]. Smoking behavior involves not only a biological addiction, but also psycho-cognitive components. This runs from smoking initiation, through to maintaining, attempts at quitting, and relapse; especially if these factors related to certain gender, e.g., female.

Epidemiologically, Globally, adult smoking prevalence in 2020 was 32.6% (32.2% to 33.1%) and 6.5% (6.3% to 6.7%) among men and women, respectively. 1.18 (0.94 to 1.47) billion people regularly smoke tobacco, causing 7.0 (2.0 to 11.2) million deaths in 2020 [3].

According to previous study by Wang et al. [4], the high prevalence of smoking is strongly related to low socioeconomic and education level, unemployment and poor marital status [4]. According to Tsai et al. [5], regarding smoking maintenance behaviors, male smokers consumed significantly more cigarettes than women (18 vs. 11 cigarettes per day), although the time from waking to the first cigarette of the day was almost alike for both sexes. The triggers of smoking behavior between men and women were very different; men craved cigarettes in social gatherings and with friends, whereas women craved them when anxious, angry, or frustrated [6]. Men were more presumably to use tobacco in socially relevant situations while for women in emotionally pertinent ones [5,6].

Smoking can change the smoker's body, e.g., histologically, anatomically and psychologically [5-7]. Cigarette smoke can modify the cell cycle [2]. Smoking harms the cells lining the blood vessels and heart and can increase the risk of clots that cause heart attacks. Smoking can also contribute to an abdominal aortic aneurysm or any Other blood vessels [7,8]. Carcinogens present in the smoke of tobacco products have an important role in altering the genome of immune cells, whether by implanting chemical adducts in the cellular DNA or by inducing irreversible genetic damage. there is scientific

evidence regarding 98 of the over 5000 chemicals in tobacco smoke are known carcinogens that can act on cancer genes such as K-RAS and p53 [2]. Through various mechanisms these compounds can activate molecules involved in the cell cycle, such as cyclins, and molecules involved in apoptosis and autophagy, such as Beclin-1 or LC3B [1,2].

Nowadays, more than 20 percent of Indonesian youth's smoke [7,8]. Thanks to the low price of cigarettes and other tobacco products, the country boasts one of the world's highest smoking rates among youths and adults. Tobacco products are also readily available at *warung* (kiosks) on every corner, whether in megacities or villages [7].

According to data, the government derived get a lot of state income from the cigarette excise tax which increases from year to year [7]. From 2015 to 2020, the government administration raised tobacco excise by around 75% [9]. In January 2021, a further 12.5% rise was imposed. There were three reasons for this policy, namely to reduce consumption, regulate the industry and boost government revenue [10]. In 2020, the estimated government revenue from tobacco excise alone was Rp. 173 trillion. The cigarette industry is still one of the motors for the movement of the national economy; some 3.4 million workers are involved in all aspects of the tobacco industry from growing to retailing. The multiplier effect means that 13.6 million Indonesians, most of whom are women and children, are estimated to be dependent for their support upon tobacco [8].

Although comparatively few women are smokers, they are a major source of labor in the manufacture of cigarettes. Traditionally tobacco production has been considered to be women's work [11]. In the Jember area in the Besuki Residency in Java, some 50% of Indonesia's total export crop is produced, and most of the labor-intensive work in the fields and factories is done by females [8]. Rates of pay are poor and insufficient for the minimum daily physical expenditure of workers [8,11].

The social environment has a vital role in shaping smoking behavior in women [12]. Among female tobacco users, as well as male, cigarette was the most commonly used tobacco product [13]. Many studies suggested that women seriously more prone to smoking-related morbidity and mortality. For this reason, it is

interesting to review previous electronic literature available on the internet regarding epidemiology of smoking among Indonesian women, and its associated factors.

## 2. MATERIALS AND METHODS

This study is a simple literature study by reviewing the electronic literatures regarding prevalence of female smokers and its association factors in Indonesia. Data sources are taken from popular scientific search engine named PubMed® and Google scholar™. The phrases used in this study were "Female Smokers in Indonesia pdf", "Risk Factors for Female Smokers in Indonesia pdf", "Prevalence smoking in Indonesia". The keywords used are prevalence, risk factors, smokers, and women. A combination of search terms is used in Indonesian and English. Article retrieval uses purposive sampling which will be selected according to keywords, reading the title, abstract and content of the article. The collection until the research work is carried out in January 2022 to July 2022. The data collected will be entered systematically with tabulation and presentation of the map of Indonesia.

The variables in this study were age, internal and external risk factors, and the occupation of female smokers. Articles obtained were screened manually. The total number of articles obtained was 106 research articles and then became 82 articles after going through the exclusion duplication screening and then re-screened based on the appropriate research titles and abstracts and 41 articles were obtained. Then there were 26 articles that did not meet the inclusion and exclusion criteria of the study. and the final total number of eligible articles that have passed all stages of 15 research articles Related matters if needed will also be entered into the table.

## 3. RESULTS AND DISCUSSION

The data obtained are the results of searches through PubMed® and Google Scholar using keywords obtained as many as 106 research articles. Research articles that have been collected are selected manually and articles that have passed the selection stage are 14 articles. All important data from all articles are presented in tabular form and then followed by an attempt to describe geographical location where the study conducted This is done by placing dots and related numbers in Indonesia map.

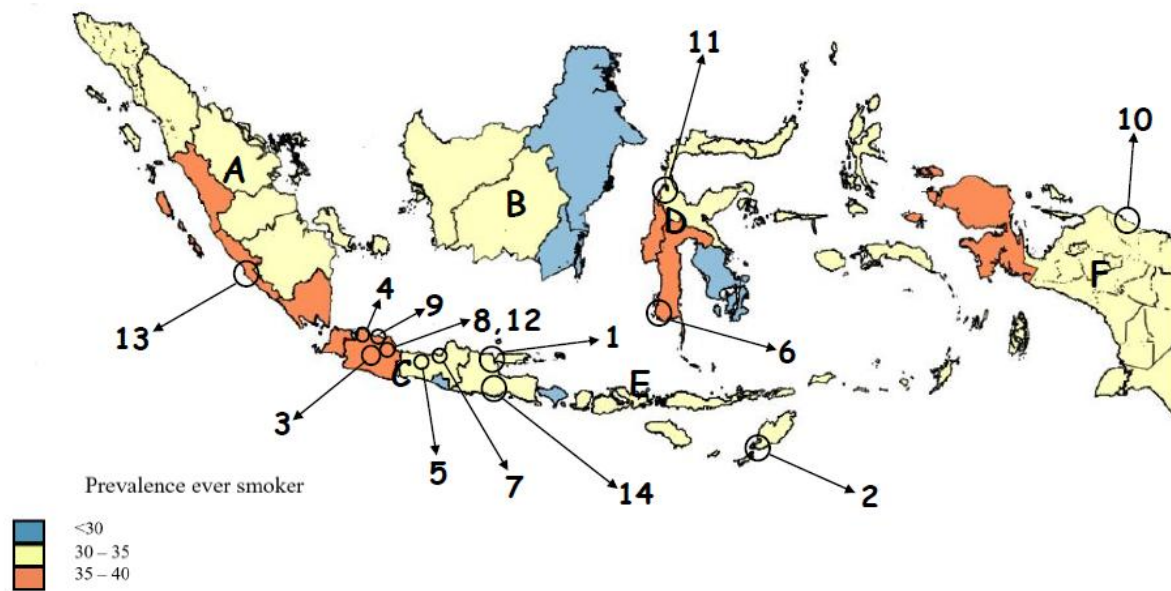
**Table 1. Summary of scientific articles found in several regions of Indonesia regarding female smokers available in the internet**

No.	Author (year of publication)	Design of study	Location	N	Findings	Database
1.	Hardesty J et al. [14]	Descriptive research, using survey with convenience sampling that was utilized in two malls.	Surabaya, East Java	128 adults female daily smokers (age 18-24)	<ul style="list-style-type: none"> <li>- Female daily smokers in Surabaya, Indonesia, smoked five to six more cigarettes per day than in past national surveys</li> <li>- Average number 13,8 cigarettes/day, consist of 7,3% white machine-rolled cigarettes/day, 4,2% kreteks/day and 2,4% roll-your-own cigarettes/day</li> <li>- .37% sample smoked their first cigarettes within 5 minute of waking up and 76% within 30 min of waking.</li> <li>- &gt;53% had a heavy smoking index indicating moderate or high addiction</li> <li>- 51% did not attempt to quit smoking in the previous 12 months</li> <li>- 55% planned to quit beyond six months or not all</li> </ul>	Pubmed Available: <a href="https://doi.org/10.1016/j.puhe.2019.03.007">https://doi.org/10.1016/j.puhe.2019.03.007</a>
2.	Pingak M, Miller C [15]	Cross sectional and medical student based	Kupang, East Nusa Tenggara	115 female students	<ul style="list-style-type: none"> <li>- 65,3% reported a very low level of parental income (below provincial minimum wage</li> <li>- Among the smoking population, 16,2% identified as a daily smoker, 9,7% occasional smokers.</li> <li>- 24.4% smokers smoked factory-made cigarettes, 12.8% smoked cigar, pipe</li> </ul>	Pubmed Available: <a href="https://doi.org/10.31557/APJCP.2019.20.6.1709">https://doi.org/10.31557/APJCP.2019.20.6.1709</a>

No.	Author (year of publication)	Design of study	Location	N	Findings	Database
					or any tobacco products - 16.7% ex-smokers	
3.	Tjahajawati S, Rafisa A, Lestari E [16]	Analytical study using a cross- sectional approach	Bandung, West Java	26 female smokers and 37 non smokers (age 18-64)	Most female smokers (76.9%) identified as overweight or obese. 80.8% received education only up to the primary level and 76.9% were housewives. The mean calcium level of female smokers (1.16 mmol/L) lower than non- smokers (1.8 mmol/L).	Pubmed Available: <a href="https://doi.org/10.1155/2021/2221112">https://doi.org/10.1155/2021/2221112</a>
4.	Fauzi R, Areesantichai C [17]	Descriptive research, using survey with multistage cluster random sample	Jakarta	1.318 public high school students, 62.8% (n=828) female students	Cigarettes using: - 8.5% current users - 13.8% experimental users - 77.7% non-users Water pipe using: - 3.3% current users - 10.6% experimental users - 86.1% non-users Water pipe use was significantly associated with family use, friend use, and availability.	Pubmed Available: <a href="https://doi.org/10.1515/ijamh-2020-0084">https://doi.org/10.1515/ijamh-2020-0084</a>
5.	Widiyaningsih D, Suharyanta D [18]	Descriptive quantitative using total sampling technique	Dieng	113 elderly women (age >60)	Distribution of respondent's characteristics by occupation: - 7.1% elderly work as housewives - 16.8% work as laborers - 22.1% work as farmers - 29.2% work as traders - 24.8% work as entrepreneurs there is a significant influence between geography and smoking behavior in elderly women((p) < 0,05	Google Scholar Available: <a href="https://doi.org/10.29241/jmk.v6i2.539">https://doi.org/10.29241/jmk.v6i2.539</a>
6.	Muliyana D, M.Thaha I	Cross sectional college student	Makassar	192/378 female college	Most respondents at the Faculty of Medicine as much	Google Scholar Available: <a href="https://doi.org/10.30597/mkmi.v9i2.446">https://doi.org/10.30597/mkmi.v9i2.446</a>

No.	Author (year of publication)	Design of study	Location	N	Findings	Database
	[19]	based		students	as 12% of the total female respondents. Reasons to start smoking: - Try it out/follow a friend (74.1%) - Following the trend/fashion (2,5%) - Stress escape (19.6%) - Symbol of masculinity/maturity (3.8%)	
7.	Mirnawati M, Nurfitriani N, Zulfiarini F et al. [20]	Cross sectional	Semarang	10/30 teenage girls	Reasons to start smoking: - Invited by friends (20%) - Friends Influence (17%) - Imitating Parents or Family - Curious to try (10%) - Effect of Cigarette Advertising	Google Scholar doi:Available: <a href="https://doi.org/10.15294/higeia.v2i3.26761">https://doi.org/10.15294/higeia.v2i3.26761</a>
8.	Astuti S, Susanti A, Elista R [21]	Cross sectional using total sampling technique	Sumedang	30 pregnant women in the 1 <sup>st</sup> , 2 <sup>nd</sup> , and 3 <sup>rd</sup> trimesters	Pregnant women who are exposed cigarette at gestational age 13-28 weeks by 56.25%. Exposure amount >10 cigarettes/day by 83.33%	Google Scholar Available: <a href="https://doi.org/10.24198/jsk.v2i1.10413">https://doi.org/10.24198/jsk.v2i1.10413</a>
9.	Ariani D, Mulyono S, Widyatuti [22]	Cross sectional using random sampling	Karawang	115/356 female school children	Factors associated with smoking behavior in children: - First age of smoking - Trends and want to be cool - Family smokers	Pubmed Available: <a href="https://doi.org/10.1080/24694193.2019.1578436">https://doi.org/10.1080/24694193.2019.1578436</a>
10.	Herawati L, Budiman J, Haryono W et al. [23]	Survey based research in three different schools	Jayapura	10/23 female school children (age 11-14)	69,23 % of respondents have smoking parents. There are another family member(25,64%) who lives with the respondent who smokes.	Pubmed Available: <a href="https://doi.org/10.1007/s10900-016-0232-4">https://doi.org/10.1007/s10900-016-0232-4</a>
11.	Devi R, Fauzan, Nur R et al. [24]	Cross sectional	Palu	80 female smokers	43.76% of respondents are heavy smokers and have poor knowledge about	Google Scholar <a href="https://medic.upm.edu.my/upload/dokumen/2021122908104106_MJMHS_0075.pdf">https://medic.upm.edu.my/upload/dokumen/2021122908104106_MJMHS_0075.pdf</a>

No.	Author (year of publication)	Design of study	Location	N	Findings	Database
					smoking and 37.5% have worked 42.5% of respondents are heavy smokers and have peers who are also smokers.	
12.	Akbar R,Istiqomah A,Afriandi I [25]	Cross sectional	Sumedang	99 females smokers	Respondents admitted to smoking as - an experiment (10.10%), - as recreational (16.17%), - situational (34.34%), - intensive (34.34%) and - compulsive (5.05%)	Google Scholar Available: <a href="https://doi.org/10.15850/amj.v6n4.1763">https://doi.org/10.15850/amj.v6n4.1763</a>
13.	Karini A, Padmawati S [26]	Phenomenological research with snowball sampling	Bengkulu	15 female smokers	The start of smoking cigarette	Google Scholar Available: <a href="https://doi.org/10.22146/bkm.26942">https://doi.org/10.22146/bkm.26942</a>
14.	Riyandi G, Wilyono J, Candrawati E [27]	Cross sectional	Malang	30 female smokers	There is a relationship between the social environment and smoking behavior in women (p-value = 0,003< $\alpha$ (0,05)	Google Scholar Available: <a href="https://doi.org/10.33366/nn.v2i2.536">https://doi.org/10.33366/nn.v2i2.536</a>



**Fig. 1. An Indonesian Map of smoking Number showing the location of published research listed in the previous table regarding the prevalence of smoking in women with data derived from published electronic data obtained from internet sources. The image is a modification from the source of SUSENAS 2019. There is a modification where we divide several islands in Indonesia by assigning an letter to each island. (A) Sumatra Island, (B) Kalimantan Island, (C) Java Island (D) Sulawesi Island, (E) Nusa Tenggara Islands and finally the easternmost island in Indonesia (F) Papua Island. In addition there are circles and arrows that indicate the location of the mapping based on Table 1**

Table 1 contains the prevalence and characteristics of female smokers in Indonesia in time period of 2016 – 2022. Methodologically, most of the study using a simple, cross sectional method (60%). An interesting study conducted by Karini et al. [26] are using the Phenomenological research method which examined 15 female smokers with snowball sampling.

Hardesty et al. [14] conducted study in Surabaya involving 128 adult female smoker aged 18-24. The result is the average number of cigarettes consumed daily (13.8 cigarette /day) is more than the national average consumption; with the type of cigarettes most consumed is in the form made by factory machines. In their daily life, all respondents immediately start smoking immediately after waking up, 57% showed sign of high tobacco addiction.

Pingak et al. [15] showed us through their study among 115 female smoker students in Kupang that most of their respondent come from low level of parental income, less than the minimum provincial wage. Among the smoking population, 16.2% considered as daily smoker with 24.4% smoked factory made-cigarettes.

While Tjahajawati et al. [16] in Bandung, east Java found out that from 26 female smoker vs. 37 non-smokers aged 18-64 years old, that most of female smokers identified as overweight or obese, 80.8% have a low level educational background and 76.9% were married. Female smokers have a lower calcium level compares to the non-smoking ones.

Fauzi et al. [17] in Jakarta conducted survey in 1318 public high school students which 62.8% were female. The result is 77.7% do not smoke cigarettes and 86.1% do not use waterpipes; the results were 77.7% did not smoke cigarettes and 86.1% did not use a waterpipes; where the use of tools such as water pipes is always used by friends or relatives first, as well as their availability.

Widiyaningsih [18] conducted a descriptive quantitative study regarding 113 elderly women with 4 out of each 6 respondent age over 60 years old were active smoker and this practice affected by the topo-geographical condition and socio-cultural practice among local people.



Muliyana et al. [19] in Makassar found out that 15,2% out of 192 female respondents have history of smoking. Most of respondents who are active smokers have negative support from family or peers.

Mirrawati et al. [20] in Semarang studied teenage population where 10 out of total 30 respondents were female. The results of his survey-based research did not find adolescent girls who smoked.

An interesting study conducted by Astuti et al. [21] in Sumedang, west Java where she and her colleagues surveyed 30 pregnant women from 1<sup>st</sup>-3<sup>rd</sup> semester and their exposure to cigarettes. Exposure to cigarette smoke for pregnant women who were the respondents of this study were came from husbands who smoke in the house and the quantity of daily exposure was equal to  $\geq$  10 cigarettes and lasts every day.

Ariani et al. [22] in Karawang conducted an interesting cross sectional study regarding a relationship between age risk factors for the first-time smoking, family of smokers, and following trends and wanting to be cool with smoking behavior of primary school-age children.

Herawati et al. [23] in Jayapura- Papua scrutinized grade 7 students from 3 local junior high school, aged 11–14 years. from 78 respondents, 59 % were female and 41% were male. Respondents who smoke were 23 respondents (29.3 %), and out of that percentage, female smoker were 43.48%. Among 29.3 % of respondent teenagers, 69.23 % of their parents and or 25.6 % of other family members were also smokers with low level educational background.

Another research article that is also included in this research is the one organized by Devi et al. [24] in Palu, Indonesia. This group of researchers selected 80 females active smoker and assess factors related to their smoking behavior, namely knowledge of smoking, peer influence, early age of smoking and employment status. In their recommendation, there is urgency to seek relevant information about the gender based effects of smoking. Health education and health promotion are important action to spread awareness regarding the dangers of smoking.

Akbar et al. [25] in Sumedang want to examine smoking behavior among 99 undergraduate female students in Universitas Padjadjaran,

Bandung-Indonesia and it turns out that the results were as follows: 40.40% have started smoking in high school, 31.32% in the university, and 25.25% in junior high school. The smoking intensity was moderate (45.45%), but some were high (29.30%). The location preference for smoking was both in private and public places (88.89%), driven by both positive and negative moods (88.89%). Interestingly, the most addiction level was situational (34.34%) or intensive (34.34%).

The next study included in this study is the one by Karini et al. [26] in Bengkulu. This study is interesting because the researchers conducted a phenomenological approach through a mix approach comprising in-depth interview and closed observation to 15 female active smokers. The causes of women's smoking behavior are imitating close friends, the influence of mothers who is also smoking, smoking after tired of working, cravings while pregnant and find the smell of cigarettes pleasant and fragrant, including for the practice of smoking right after meal, and the husband's permissiveness towards smoking behavior. The study also found that there had never been health education for women in the context of the dangers of smoking in this area.

The last study being included in this review is the one conducted by Riyandi et al. [27]. They surveyed 30 female smoker and they found out that 20 out of 30 respondents (66.6%) were heavy smoker. Social milieu and social environment influence smoking behavior among women.

From the map above, it can be seen the extent of the coverage area of Indonesia. with population in Indonesia is expected to reach 275.40 Million by the end of 2022, according to Trading Economics global macro models and analyst expectations. In the long-term, the Indonesia Population is projected to trend around 275.40 Million in 2023, according to the econometric models.

There is a modification where we divide several islands in Indonesia by assigning a letter to each island. (A) Sumatra Island, (B) Kalimantan Island, (C) Java Island (D) Sulawesi Island, (E) Nusa Tenggara Islands and finally the easternmost island in Indonesia (F) Papua Island. in addition, there are circles and arrows that indicate the location of the mapping based on Table 1.

From the mapping above, based on the results of the study (n=15), it was found that the island of Java is the area with the highest distribution of female smokers (10/15 = 66%) compared to other islands. Data regarding prevalence of smoking for adult females in Indonesia from 2007 to 2018 continues in a downward pattern, from 10.8% in 2008 and decreased to 5.3% in 2018 [28]. The number of female smokers across Indonesia remains low compared to males. Further research needs to be done regarding the factors that influence the tendency of low smoking prevalence in women, in the context of reducing the prevalence in male smokers.

In women, smoking causes a lot of health problems, only blood pressure where systolic and diastolic pressures are higher in women who smoke than those who do not smoke. It also causes an increase in blood sugar caused by a decrease in taste sensitivity associated with smoking which will lead to a higher intake of calories, salt and fat [16].

There are many factors that cause women to smoke, in the research that has been collected, on average, adolescent girls start smoking because the social environment and invitations from peers also follow trends and want to look cool. And living in a smoking family will also make children interested in starting smoking [14-27].

Cigarette smoke is sometime considered more harmful to passive smokers than active smokers [29]. Exposure to cigarette smoke that pregnant women inhale while at home comes from the husband of pregnant women who are active smokers [30]. However, according to research, there are psychological factors in pregnant women when smelling the smell of cigarettes is a factor for starting smoking and husbands who also allow them to smoke. Active and passive tobacco consumption has significant adverse effects, *e.g.*, a low birth weight baby and premature delivery. during pregnancy and postpartum period [31].

women's smoking around pregnancy was strongly associated with the partner's smoking status before pregnancy [32], partner's change in smoking during pregnancy [33], and partner's change in smoking postpartum [34]. Women's educational level and cannabis use before pregnancy were also related with women's smoking before and during pregnancy [36]. Women's ferocity of alcohol use before

pregnancy was obscurely associated with women's history of smoking, especially prior and during pregnancy.

Conclusively, it seems essential that partners of women with smoking habits quit smoking before pregnancy occurs and stay away from smoking during pregnancy period [37]. If their partners continue smoking during pregnancy, they should quit smoking postpartum, immediately [38]. It is interesting to explore how health care professionals can perform an important role in addressing partners' smoking and giving them evidence-based cessation support through the entire period of pregnancy, before, during, and after.

Even though there is growing of research evidence-based data on female-specific health risks associated with smoking, but unfortunately those data have not touched much about the specific physical, emotional-psychological, and economic reasons that facilitate women take up and continue smoking or vice versa stop smoking. Understanding these underlying circumstances is critical for providing insights and recommendations for a more specific and female-friendly tobacco-control action.

Moreover, though women are always the minority of smokers, their lives can still be impacted by tobacco use, often in very different ways to men [39]. Women who smoke have a 25% greater excess relative risk for CHD compared with men who smoke [40]. Even though sex differences in smoking behavior do not seem to explain the observed excess risk of smoking in women, it may be that women respond in a biologically different way to smoking than men [41].

Some women choose to smoke and deal with discrimination and even stigmatization [42]. Even every day, non-smokers women are threatened to passive and unintentionally smoke as they frequently cannot give a wide berth to male smokers in their ménage, in environment or in public [43]. Women, and all other passive smokers group, *e.g.*, children, are prone to non-communicable illnesses caused by smoking [44]. There is also an increased risk of becoming a single parent and/or the main wage earner if their spouses become sick and handicapped or even passed away due to chronic and excessive tobacco abuse [45].

To some extent, some women are placed in a difficult position due to their smoking habits [47].

They are expected to act righteously while at the same time are inescapably unveiled to risky smoking attitude and for those who choose to smoke openly definitely experience unwanted negative social attitudes and pressure [48]. For the women who take up smoking this means discontinuing is harder due to not only addiction and peer and other kind of pressures, but a lack of support for overcoming it all [49,50]. Having a partner who smokes can influence the spouse's initiation of smoking, or return to smoking after a previous quit attempt [51,52]. In other words, it is possible that a nonsmoking partner can influence his/her spouse to stop smoking [51,53].

This study has many strengths including bringing together information about female smokers from several regions in Indonesia which are geographically very broad, yet it does have some limitations. First, the data can still be said scattered and limited, the research methods summarized are still diverse and therefore may underestimate the real number of female smoker prevalence. Further study need to be conducted regarding female smoker, e.g., longitudinal data on the smoking behavior of both partners and also the possibility of smoking cessation—those with partners who also quit.

Existing behavioral interventions often encourage smokers to reduce exposure to relapsogenic situations or cues and/or promote the regulation of affect (including craving) through the use of strategies intended to modify the content, frequency or intensity of private psychological experiences [46,47,50]. The limitation of success regarding present-day smoking cessation therapies encourages research into exploration of new treatment procedures [47,51-53].

Mind-body practices such as yoga and meditation have the potential to aid smoking cessation and become an alternative drug-free treatment option [54]. Further exploration should be conducted in order to measure the efficacy of yoga and other meditation-based interventions for smoking habit cessation. There is evidence that Yoga may be helpful as an aid for smoking cessation. Yoga has been shown to reduce stress and negative mood and may aid weight control, all of which have proven to be barriers to quitting smoking. This study conducted by Bock et al. was the first rigorous, randomized clinical trial of Yoga as a complementary therapy for smokers attempting to quit [55].

## 4. CONCLUSION

This literature study discusses the prevalence and risk factors of female smokers in Indonesia. Smoking is still a common health problem that causes death on a large scale in the world, especially in the vulnerable group like women. Many internal and social factor affect this practice among women. By teaching them properly about the future risk of smoking and support them actively to quit smoking; this approach will save her future and her descendant. Yoga and or other alternative approach might be an alternative for those who want to quit smoking.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Park S, June KJ. The Importance of Smoking Definitions for the Study of Adolescent Smoking Behavior. *Journal of Korean Academy of Nursing*, 2006;36(4): 612-20
2. Gritz ER, Talluri R, Fokom Domgue J, Tami-Maury I, Shete S. Smoking Behaviors in Survivors of Smoking-Related and Non-Smoking-Related Cancers. *JAMA Netw Open*. 2020;3(7):e209072. Available:<https://doi.org/10.1001/jamanetwopen.2020.9072>
3. Dai X, Gakidou E, Lopez AD. Evolution of the global smoking epidemic over the past half century: strengthening the evidence base for policy action *Tobacco Control* 2022;31:129-137 Available:<https://doi.org/10.1136/tobaccoccontrol-2021-056535>.
4. Wang X, Zhang T, Wu J, Yin S, Nan X, Du M, et al. The Association between Socioeconomic Status, Smoking, and Chronic Disease in Inner Mongolia in Northern China. *Int J Environ Res Public Health*. 2019;16(2):169.

- Available:<https://doi.org/10.3390/ijerph16020169>.
5. Tsai YW, Tsai TI, Yang CL, Kuo KN. Gender differences in smoking behaviors in an Asian population. *J Womens Health (Larchmt)*. 2008 ;17(6):971-8. Available:<https://doi.org/10.1089/jwh.2007.0621>.
  6. Ferguson SG, Frandsen M, Dunbar MS, Shiffman S. Gender and stimulus control of smoking behavior. *Nicotine Tob Res*. 2015;17(4):431-7. Available:<https://doi.org/10.1093/ntr/ntu195>
  7. Tirtana, A., & Ariutama, I. G. The effect of cigarette prices and income on cigarettes consumption and state revenue: Case study of 33 provinces in Indonesia. *Jurnal Ekonomi Dan Bisnis*, 2022;25(1): 137-152. Available:<https://doi.org/10.24914/jeb.v25i1.4037>
  8. Barraclough S. Women and tobacco in Indonesia *Tobacco Control* 1999;8:327-332.
  9. Barber S, Adioetomo SM, Ahsan A, Setyonaluri D. Tobacco Economics in Indonesia. Paris: International Union Against Tuberculosis and Lung Disease; 2008.
  10. Astuti, P.A.S., Assunta, M. & Freeman, B. Why is tobacco control progress in Indonesia stalled? - a qualitative analysis of interviews with tobacco control experts. *BMC Public Health* 2020;20: 527. Available:<https://doi.org/10.1186/s12889-020-08640-6>
  11. World Bank Group. the economics of tobacco taxation and employment in indonesia. Available:<https://documents1.worldbank.org/curated/en/919961507699751298/pdf/120352-REVISED-WBGIndoEmploymentweb.pdf>
  12. Sande, D., Padmawati, R. S., & Prabandari, Y. S. (). Women smokers in Yogyakarta: a phenomenological study. *BKM Public Health and Community Medicine*, 2021;37(10). Available:<https://journal.ugm.ac.id/v3/BKM/article/view/2138>
  13. Sutanto E, Goniewicz M L. Sociodemographic factors associated with use of various tobacco products among Indonesian women: Finding from Indonesia Demographic and Health Surveys 2017. *Tobacco Induced Diseases*. 2021;19(1): A73. Available:<https://doi.org/10.18332/tid/140965>.
  14. Hardesty JJ, Kaplan B, Martini S, Megatsari H, Kennedy RD, Cohen JE. Smoking among female daily smokers in Surabaya, Indonesia. *Public Health*. 2019 Jul;172:40–2. Available:<https://doi.org/10.1016/j.puhe.2019.03.007>.
  15. Pingak MS, Miller CL. Smoking Perceptions and Practice among Nursing Students in Kabupaten Kupang, Indonesia. *Asian Pacific Journal of Cancer Prevention*. 2019 ;20(6):1709–16. Available:<https://doi.org/10.31557/APJCP.2019.20.6.1709>.
  16. Tjahajawati S, Rafisa A, Lestari EA. The Effect of Smoking on Salivary Calcium Levels, Calcium Intake, and Bleeding on Probing in Female. *International Journal of Dentistry*. 2021;2021:1–7. Available:<https://doi.org/10.1155/2021/2221112>
  17. Fauzi R, Areesantichai C. Determinants of waterpipe smoking among high school students in Jakarta, Indonesia. *International Journal of Adolescent Medicine and Health*. 2020;0(0). Available:<https://doi.org/10.1515/ijamh-2020-0084>
  18. Widiyaningsih D, Suharyanta D. Pengaruh Sosial Budaya Dan Geografis Terhadap Perilaku Merokok Pada Lansia Perempuan Di Wilayah Dataran Tinggi Dieng Wonosobo. *Jurnal Manajemen Kesehatan Yayasan RS Dr Soetomo*. 2020;6(2):245. Available:<https://jurnal.stikes-yrsds.ac.id/index.php/JMK/article/view/539/164>
  19. Mulyana D, M.Thaha IL. Faktor yang berhubungan dengan tindakan merokok pada mahasiswa Universitas Hasanuddin Makassar. *Media Kesehatan Masyarakat Indonesia [Internet]*. 2016;9(2):109–19. Available:<https://journal.unhas.ac.id/index.php/mkmi/article/view/446>
  20. Mirnawati M, Nurfitriani N, Zulfirani F, Cahyati W. Perilaku Merokok pada Remaja Umur 13-14 Tahun. *HIGEIA (Journal of Public Health Research and Development)*. 2018;2(3):396–405. Available:<https://doi.org/10.15294/higeia.v2i3.26761>
  21. Astuti S, Susanti AI, Elista R. Gambaran paparan asap rokok pada ibu hamil berdasarkan usia kehamilan di desa Cintamulya kecamatan Jatinangor

- kabupaten Sumedang. *Jurnal Sistem Kesehatan*. 2016;2(1). Available:<https://doi.org/10.24198/jsk.v2i1.10413>
22. Ariani DR, Mulyono S, Widyatuti. Risk Factors for the Initiation of Smoking Behavior in Primary School Age Children in Karawang, Indonesia. *Comprehensive Child and Adolescent Nursing*. 2019 Mar 29;42(sup1):154–65. Available:<https://doi.org/10.1080/24694193.2019.1578436>.
  23. Herawati L, Budiman JA, Haryono W, Mulyani W. Jayapura Teenagers Smoking Behavior. *Journal of Community Health*. 2017;42(1):78–82. Available:<http://doi.org/10.1007/s10900-016-0232-4>
  24. Devi R, Fauzan, Nur R, Sridani WN. Smoking Behavior Among Women In Palu, Indonesia. *Malaysian Journal of Medicine and Health Sciences*. 2021;27–30. Available:[https://medic.upm.edu.my/upload/dokumen/2021122908104106\\_MJMHS\\_0075.pdf](https://medic.upm.edu.my/upload/dokumen/2021122908104106_MJMHS_0075.pdf)
  25. Akbar RI, Istiqomah AN, Afriandi I. Smoking Behavior among Undergraduate Female Students in Universitas Padjadjaran Bandung. *Althea Medical Journal*. 2019 ;6(4):196–200. Available:<http://journal.fk.unpad.ac.id/index.php/amj/article/view/1763>
  26. Karini TA, Padmawati RS. Fenomena perokok wanita di wilayah kerja Puskesmas Tes, Kabuapten Lebong, Provinsi Bengkulu. *Berita Kedokteran Masyarakat*. 2018;34(1):19. Available:<http://etd.repository.ugm.ac.id/pelelitian/detail/128948>
  27. Riyandi G, Wiyono J, Candrawati E. Hubungan lingkungan sosial dengan perilaku merokok pada wanita di kota Malang. *Nursing news*. 2017;2:2. Available:<https://publikasi.unitri.ac.id/index.php/fikes/article/view/536/439>
  28. Nurhayati-Wolff H. Prevalence of smoking for females Indonesia 2007-2018. Available:<https://www.statista.com/statistics/732727/indonesia-female-smoking-rate/>
  29. Arcury TA, Trejo G, Moore D, Howard TD, Quandt SA, Ip EH, Sandberg JC. "It's Worse to Breathe It Than to Smoke It": Secondhand Smoke Beliefs in a Group of Mexican and Central American Immigrants in the United States. *Int J Environ Res Public Health*. 2020;17(22):8630. DOI:<http://doi.org/10.3390/ijerph17228630>.
  30. Yang L, Tong EK, Mao Z, Hu TW. 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. Available:<http://doi.org/10.3109/00016341003713851>.
  31. Míguez MC, Pereira B. Repercusiones del consumo de tabaco activo y/o pasivo en el embarazo y postparto [Effects of active and/or passive smoking during pregnancy and the postpartum period]. *An Pediatr (Engl Ed)*. 2020:S1695-4033(20)30288-5. Spanish. Available:<http://doi.org/10.1016/j.anpedi.2020.07.029>.
  32. McBride CM, Curry SJ, Grothaus LC, Nelson JC, Lando H, Pirie PL. Partner smoking status and pregnant smoker's perceptions of support for and likelihood of smoking cessation. *Health Psychology*, 1998;17(1): 63–9. Available:<https://doi.org/10.1037/0278-6133.17.1.63>
  33. Ziebland S, Mathews F. How important is the smoking status of the woman's partner as a predictor of smoking cessation in pregnancy? A literature review. *Health Education Journal*. 1998;57(1):70-80. Available:<http://doi.org/10.1177/001789699805700108>
  34. Bottorff JL, Kalaw C, Johnson JL, Stewart M, Greaves L, Carey J. Couple Dynamics During Women's Tobacco Reduction in Pregnancy and Postpartum, *Nicotine & Tobacco Research*, 2006; 8(4): 499–509. Available:<https://doi.org/10.1080/14622200600789551>
  35. Scheffers-van Schayck T, Tuithof M, Otten R, Engels R, Kleinjan M. Smoking Behavior of Women Before, During, and after Pregnancy: Indicators of Smoking, Quitting, and Relapse. *Eur Addict Res*. 2019;25(3):132-144. Available:<https://doi.org/10.1159/000498988>
  36. Skelton KR, Hecht AA, Benjamin-Neelon SE. Women's cannabis use before, during, and after pregnancy in New Hampshire. *Prev Med Rep*. 2020;20:101262. Available:<https://doi.org/10.1016/j.pmedr.2020.101262>.
  37. Taylor AE, Davey Smith G, Bares CB, Edwards AC, Munafò MR. Partner smoking and maternal cotinine during pregnancy: implications for negative control methods.

- Drug Alcohol Depend. 2014;139(100): 159-63.  
Available:<https://doi.org/10.1016/j.drugalcdep.2014.03.012>.
38. Román-Gálvez, RM, Amezcua-Prieto, C, Olmedo-Requena, R, Lewis-Mikhael Saad, AM, Martínez-Galiano, JM, Bueno-Cavanillas, A. Partner smoking influences whether mothers quit smoking during pregnancy: a prospective cohort study. *BJOG*. 2018;125:820–827.  
Available:<https://doi.org/10.1111/1471-0528.14986>
  39. Allen AM, Oncken C, Hatsukami D. Women and Smoking: The Effect of Gender on the Epidemiology, Health Effects, and Cessation of Smoking. *Curr Addict Rep*. 2014;1(1): 53-60.  
Available:<https://doi.org/10.1007/s40429-013-0003-6>.
  40. King A. Cigarette smoking increases the risk of coronary heart disease in women more than in men. *Nat Rev Cardiol* 2011;8: 612.  
Available:<https://doi.org/10.1038/nrcardio.2011.134>
  41. Peters SAE, Huxley RR, Woodward MD. Do smoking habits differ between women and men in contemporary Western populations? Evidence from half a million people in the UK Biobank study. *BMJ Open* 2014;4:e005663.  
Available:<https://doi.org/10.1136/bmjopen-2014-005663>
  42. Antin TMJ, Annechino R, Hunt G, Lipperman-Kreda S, Young M. The Gendered Experience of Smoking Stigma: Implications for Tobacco Control. *Crit Public Health*. 2017;27(4):443-454.  
Available:<https://doi.org/10.1080/09581596.2016.1249825>.
  43. Agrawal D, Aggarwal AK, Goel S. Women exposed to second-hand smoke more at home than at workplace: An analysis of GATS Report, India, 2009–10. *Journal of Family Medicine and Primary Care*, 2015; 4(3):293-7.  
Available:<https://doi.org/10.4103/2249-4863.161300>
  44. Bhatt G, Goel S, Grover S, Kaur N, Singh S. A cross sectional study to assess tobacco use and its correlates among patients attending non-communicable disease clinics of a Northern Jurisdiction in India. *Journal of Family Medicine and Primary Care*, 2021;10(8):2915-22.  
Available:[https://doi.org/10.4103/jfmpc.jfmpc\\_2471\\_20](https://doi.org/10.4103/jfmpc.jfmpc_2471_20)
  45. Homish GG, Leonard KE. Spousal influence on smoking behaviors in a US community sample of newly married couples. *Soc Sci Med*. 2005;61(12):2557-67.  
Available:<https://doi.org/10.1016/j.socscimed.2005.05.005>.
  46. Komiyama M, Takahashi Y, Tateno H, Mori M, Nagayoshi N, Yonehara H, et al. Support for Patients Who Have Difficulty Quitting Smoking: A Review. *Intern Med*. 2019;58(3):317-320.  
Available:<https://doi.org/10.2169/internalmedicine>.
  47. Castaldelli-Maia JM, Ventriglio A, Bhugra, D. Smoking: From 'glamour' to 'stigma'. *Psychiatry Clin Neurosci*, 2016;70: 24-33.  
Available:<https://doi.org/10.1111/pcn.12365>
  48. Woo J. Gendered Stigma Management among Young Adult Women Smokers in South Korea. *Sociological Perspectives*. 2018;61(3):487-508.  
Available:<https://doi.org/10.1177/0731121417751377>
  49. Perkins KA. Smoking cessation in women. Special considerations. *CNS Drugs*. 2001;15(5):391-411.  
Available:<https://doi.org/10.2165/00023210-200115050-00005>.
  50. Soulakova JN, Tang CY, Leonardo SA, Taliaferro LA. Motivational Benefits of Social Support and Behavioural Interventions for Smoking Cessation. *J Smok Cessat*. 2018;13(4):216-226.  
Available:<https://doi.org/10.1017/jsc.2017.26>.
  51. Ayuningtyas DA, Tuinman MA, Prabandari YS, Hagedoorn M. Smoking Cessation Experience in Indonesia: Does the Non-smoking Wife Play a Role? *Front Psychol*. 2021;12:618182.  
Available:<https://doi.org/10.3389/fpsyg.2021.618182>.
  52. Takagi D, Kondo N, Takada M. Differences in spousal influence on smoking cessation by gender and education among Japanese couples. *BMC Public Health* 2014;14:1184.  
Available:<https://doi.org/10.1186/1471-2458-14-1184>
  53. Margolis R, Wright L. Better Off Alone Than With a Smoker: The Influence of Partner's Smoking Behavior in Later Life. *J Gerontol B Psychol Sci Soc Sci*. 2016;71(4):687-97.

- Available:<https://doi.org/10.1093/geronb/gbu220>
54. Carim-Todd L, Mitchell SH, Oken BS. Mind-body practices: an alternative, drug-free treatment for smoking cessation? A systematic review of the literature. *Drug Alcohol Depend.* 2013;132(3):399-410. Available:<https://doi.org/10.1016/j.drugalcdep.2013.04.014>.
55. Bock BC, Dunsiger SI, Rosen RK, Thind H, Jennings E, Fava JL, et al. Yoga as a Complementary Therapy for Smoking Cessation: Results From BreathEasy, a Randomized Clinical Trial. *Nicotine Tob Res.* 2019;21(11):1517-23. Available:<https://doi.org/10.1093/ntr/nty212>.

© 2022 Daroedono et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle5.com/review-history/91897>