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Smoking behavior within families: Household exposure in Sama Subur Village, Indonesia

Perilaku merokok dalam keluarga: Paparan asap rokok di rumah tangga di Desa Sama Subur, Indonesia

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Abstract

Although smoking remains a persistent public health concern, household-level evidence on family smoking practices and secondhand smoke exposure in rural Indonesian communities remains limited, making this study relevant for local tobacco-control planning. This study aimed to describe smoking behavior within families in Sama Subur Village, Motui District, North Konawe Regency. A descriptive quantitative study with a survey design was conducted among residents of Sama Subur Village. The study used total sampling and involved 46 respondents. Data were collected using a structured questionnaire and analyzed descriptively to present respondent characteristics, smoking patterns, smoking locations, household exposure to cigarette smoke, and the presence of family rules restricting smoking inside the house. The findings showed that most heads of families worked as farmers (45.6%) and had completed senior high school or vocational high school education (47.8%). Most households had at least one smoking family member (69.6%), with husbands representing the largest proportion of smokers (84.4%). Half of smokers consumed more than eleven cigarettes per day (50.0%), and most had smoked for more than six years (87.5%). Smoking most commonly occurred on the porch (34.4%), although some respondents reported smoking inside the house (18.8%). Exposure to cigarette smoke was frequently experienced by respondents (76.5%), while most households had no rule prohibiting smoking inside the house (81.2%). These findings indicate the need for family-based education, smoke-free home rules, and community-level tobacco-control interventions.

Abstrak

Meskipun merokok tetap menjadi masalah kesehatan masyarakat yang terus-menerus, bukti di tingkat rumah tangga mengenai praktik merokok dalam keluarga dan paparan asap rokok pasif di komunitas pedesaan Indonesia masih terbatas, sehingga penelitian ini relevan bagi perencanaan pengendalian tembakau di tingkat lokal. Penelitian ini bertujuan untuk mendeskripsikan perilaku merokok dalam keluarga di Desa Sama Subur, Kecamatan Motui, Kabupaten Konawe Utara. Penelitian kuantitatif deskriptif dengan desain survei dilakukan di antara penduduk Desa Sama Subur. Penelitian ini menggunakan metode pengambilan sampel total dan melibatkan 46 responden. Data dikumpulkan menggunakan kuesioner terstruktur dan dianalisis secara deskriptif untuk menyajikan karakteristik responden, pola merokok, lokasi merokok, paparan asap rokok di rumah tangga, serta adanya aturan keluarga yang melarang merokok di dalam rumah. Hasil penelitian menunjukkan bahwa sebagian besar kepala keluarga bekerja sebagai petani (45,6%) dan telah menyelesaikan pendidikan SMA atau SMK (47,8%). Sebagian besar rumah tangga memiliki setidaknya satu anggota keluarga yang merokok (69,6%), dengan suami sebagai kelompok perokok dengan proporsi terbesar (84,4%). Setengah dari perokok mengonsumsi lebih dari sebelas batang rokok per hari (50,0%), dan sebagian besar telah merokok selama lebih dari enam tahun (87,5%). Kebiasaan merokok paling sering dilakukan di teras (34,4%), meskipun beberapa responden melaporkan merokok di dalam rumah (18,8%). Paparan asap rokok sering dialami oleh responden (76,5%), sementara sebagian besar rumah tangga tidak memiliki aturan yang melarang merokok di dalam rumah (81,2%). Temuan ini menunjukkan perlunya pendidikan berbasis keluarga, aturan rumah bebas rokok, dan intervensi pengendalian tembakau di tingkat masyarakat.

Keywords :

family; behavior; household; exposure; smoking

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INTRODUCTION

Smoking remains one of the most serious public health problems because it contributes substantially to preventable morbidity and mortality. Cigarette use is associated not only with direct health risks among active smokers but also with adverse effects among non-smokers exposed to secondhand smoke. Globally, smoking-related diseases cause nearly six million deaths each year, while approximately 600,000 deaths occur among individuals exposed to cigarette smoke from active smokers. Without effective tobacco-control efforts, smoking-related mortality is projected to exceed eight million deaths by 2030 (Suryawati & Gani, 2022). Tobacco use is therefore closely related to the Sustainable Development Goals, particularly SDG 3 on good health and well-being, because reducing smoking exposure is essential for preventing non-communicable diseases, protecting household health, and reducing premature mortality.

The burden of smoking is particularly relevant in low- and middle-income countries, where most tobacco users reside. In 2019, the number of global tobacco users was estimated at approximately 1.3 billion, with around 80% living in low- and middle-income countries. The World Health Organization reported that tobacco use remains widespread, although global age-standardised prevalence has declined from 26.4% in 2010 to 20.9% in 2022 (David et al., 2026). Indonesia is among the countries with a high number of smokers, including among adolescents and adults. Around 34% of Indonesian adults, equivalent to 70.2 million people, reportedly use cigarettes, smokeless tobacco, or heated tobacco products, while the 2023 Indonesian Health Survey estimated approximately 70 million active smokers nationally (Rosmini et al., 2023). These figures indicate that smoking remains deeply embedded in Indonesian society and requires stronger prevention strategies at the household and community levels.

The main research problem is that smoking behavior remains common within families, creating health risks not only for smokers but also for household members exposed to cigarette smoke. In Indonesia, smoking behavior is influenced by parental smoking, peer influence, and advertising, with parental influence considered particularly strong because parents often serve as behavioral models for children and adolescents (Pertiwi & Hamdan, 2022). This problem becomes more serious when smoking occurs inside or around the home, where women, children, and other family members may be repeatedly exposed to secondhand smoke. In Southeast Sulawesi, smoking is most prevalent among productive-age groups, with the highest proportion reported among those aged 35–44 years, indicating that smoking may occur among economically active household heads and family providers (Badan Pusat Statistik Sulawesi Tenggara, 2023). A general solution requires family-based tobacco-control efforts, including health education, smoke-free home rules, parental role modelling, community-based counseling, and strengthened health promotion through local health services.

Scientific literature indicates that household smoking is shaped by social norms, family influence, and the normalization of smoking in daily life. Adolescents with smoking parents are more likely to become daily smokers than those whose parents do not smoke or have stopped smoking, showing that the family environment plays a central role in shaping smoking behavior (Pertiwi & Hamdan, 2022). This suggests that smoking prevention should not focus only on individuals but also on family structures, especially parents and household heads. Family-based interventions are important because smoking within the home can create intergenerational risks, reinforce permissive attitudes toward tobacco use, and expose non-smoking household members to harmful smoke.

At the community level, smoking control requires culturally appropriate and locally targeted health promotion. In rural areas, smoking may be practiced during work, social gatherings, and household activities, making it a socially accepted behavior rather than merely an individual habit. In Sama Subur Village, where many residents work as farmers and fishpond managers, smoking is commonly encountered in daily work and social interactions. Limited knowledge about the health risks of smoking and suboptimal tobacco-control promotion may further sustain this behavior. Therefore, effective solutions should include village-based education, involvement of community leaders, counseling through community health workers, promotion of smoke-free homes, and family discussions on the economic and health consequences of smoking.

Existing studies show that smoking remains a major public health issue in Indonesia, with high prevalence among adults and adolescents (Rosmini et al., 2023). Evidence also highlights the role of parents, peers, and tobacco advertising in shaping smoking behavior, particularly among young people (Pertiwi & Hamdan, 2022). Regional data from Southeast Sulawesi further indicate that smoking is most common among productive-age populations, especially those aged 35–44 years, which has

important implications for household health, economic productivity, and tobacco-control strategies (Badan Pusat Statistik Sulawesi Tenggara, 2023). However, available evidence often focuses on population-level prevalence or adolescent smoking, while less attention has been given to how smoking behavior occurs within families at the village level.

The novelty of this study lies in its focus on smoking behavior within families in Sama Subur Village, Motui District, North Konawe Regency. Rather than examining smoking only as an individual habit, this study describes smoking practices in the household context, including the presence of smokers in the family, smoking intensity, smoking duration, smoking locations, exposure to cigarette smoke, and the existence of rules prohibiting smoking inside the house. This focus is important because family-level smoking can directly affect household health and shape children's future smoking behavior. Therefore, this study aimed to describe smoking behavior within families in Sama Subur Village as a basis for developing more effective and targeted community-based smoking control interventions.

METHODS

A This study used an observational survey design with a descriptive quantitative approach to describe smoking behavior within families in Sama Subur Village, Motui District, North Konawe Regency. The study was conducted in Sama Subur Village, a rural community where smoking behavior was still commonly found in household settings and had the potential to expose family members to cigarette smoke. The study population consisted of all households residing in Sama Subur Village. The sampling technique used was total sampling, in which all eligible households were included as study respondents. A total of 46 households participated in this study.

The respondents were household representatives who lived permanently in Sama Subur Village and were willing to participate in the study. The inclusion criteria were families residing in Sama Subur Village during the study period, represented by an adult household member who was able to provide information about family smoking behavior, and who agreed to complete the questionnaire. Households whose representatives were unavailable during data collection or were unwilling to participate were excluded from the study.

The variables analyzed in this study included respondent characteristics and smoking behavior within the family. Respondent characteristics consisted of main occupation and highest level of education. Smoking behavior indicators included the presence of smoking habits among family members, frequency of cigarette consumption, smoking location, potential exposure of family members to cigarette smoke, smoking in the presence of children or toddlers, and the implementation of household rules prohibiting smoking inside the house.

Data were collected using a structured questionnaire developed according to the study variables. The questionnaire included items on sociodemographic characteristics, the presence of smokers in the household, the identity of smoking family members, daily cigarette consumption, duration of smoking, usual smoking location, exposure of other household members to cigarette smoke, smoking behavior around children or toddlers, and the existence of smoke-free rules inside the home. Data collection was carried out by visiting households directly and asking respondents to complete the questionnaire with guidance from the researcher when needed.

The research procedure began with coordination with local village authorities to obtain permission and support for household data collection. Eligible households were then identified, approached, and informed about the purpose and procedures of the study. Respondents who agreed to participate provided informed consent before data collection. The questionnaire was administered to each respondent, and all responses were checked for completeness before analysis.

Data were analyzed descriptively using frequency and percentage distributions. The results were presented in tables and narrative descriptions to illustrate respondent characteristics and patterns of smoking behavior within families. Descriptive analysis was used to summarize the proportion of households with smokers, smoking frequency, smoking locations, exposure to cigarette smoke, smoking behavior around children or toddlers, and the presence or absence of household smoking restrictions.

Informed consent was obtained from all respondents before participation. Respondents were informed that their participation was voluntary, their responses would be kept confidential, and the data would be used only for research purposes. No personal identifiers were presented in the study results to protect respondent privacy.

Table 1
Characteristics of household heads

Characteristics	Frequency (n)	Percentage (%)
Main occupation of household head		
Farmer	21	45.6
Laborer	3	6.5
Private-sector worker	4	8.7
Fishpond worker	1	2.2
Housewife	2	4.3
Mosque imam	1	2.2
Company employee	3	6.5
Livestock farmer	1	2.2
Driver	1	2.2
Unemployed	1	2.2
Entrepreneur	7	15.2
Fish seller	1	2.2
Highest education level of respondent		
Elementary school	14	30.4
Junior high school	9	19.6
Senior/vocational high school	22	47.8
Higher education	1	2.2

RESULTS

Table 1 shows that most household heads in the study were farmers, representing 21 respondents (45.6%), followed by entrepreneurs with 7 respondents (15.2%). Other occupations were distributed in smaller proportions, including private-sector workers, laborers, company employees, fishpond workers, livestock farmers, drivers, fish sellers, mosque imams, housewives, and unemployed respondents. In terms of education, nearly half of the respondents had completed senior or vocational high school (47.8%), followed by elementary school (30.4%), junior high school (19.6%), and higher education (2.2%). These findings indicate that the study population was largely composed of farming households with secondary-level educational backgrounds.

Table 2 shows that smoking behavior was found in most households, with 32 families (69.6%) reporting at least one smoking family member. Among smoking households, the smoker was predominantly the husband (84.4%), and most households had one smoker (84.4%). Half of the smokers consumed more than 11 cigarettes per day (50.0%), and the majority had smoked for more than six years (87.5%), indicating a long-standing and relatively intensive smoking pattern within the family environment.

Smoking most commonly occurred on the terrace (34.4%), followed by mixed locations inside and outside the house (28.1%), while 18.8% still smoked inside the house. Respondents were the group most frequently exposed to cigarette smoke (76.5%), and most households did not have rules prohibiting smoking inside the house (81.2%). Although some family members often reminded smokers not to smoke indoors (43.8%), quit attempts remained limited, with 75.0% reporting no attempt to stop smoking in the past 12 months. Family commitment was the most frequently reported support needed for behavior change (55.0%).

DISCUSSION

A This study shows that smoking behaviour within families in Sama Subur Village remains high and creates a substantial risk of secondhand smoke exposure in the household environment. Among 46 households, 32 households reported having family members who smoked, with most households having one smoker. The smoker was predominantly the husband or head of household, indicating that smoking behaviour is strongly embedded in male household roles and daily family routines. This finding suggests that smoking is not only an individual habit but also a socially reinforced practice shaped by household interaction, family acceptance, and community norms. Such a pattern is consistent with the view that smoking behaviour among heads of households may be sustained by permissive family attitudes and social environments that normalise smoking as part of everyday life (Ningsih & Rahyuni, 2025).

The findings also indicate that smoking intensity and duration were important contributors to household health risk. A considerable proportion of main smokers consumed more than eleven cigarettes per day, while most

Table 2
Description of smoking behavior within families

Smoking behavior within families	Frequency (n)	Percentage (%)
Presence of smoking family members		
No smoker	14	30.4
Smoker present	32	69.6
Smoking family member		
Husband	27	84.4
Wife	2	6.3
Adolescent child	2	6.3
Older adult	1	3.1
Number of smokers in the household		
One person	27	84.4
Two persons	5	15.6
Average number of cigarettes consumed per day		
1–5 cigarettes	3	9.4
6–10 cigarettes	6	18.8
>11 cigarettes	16	50
Unknown	7	21.9
Duration of smoking		
1–5 years	4	12.5
>6 years	28	87.5
Most common smoking location		
Inside the house	6	18.8
Terrace	11	34.4
Yard/outside the house	6	18.8
Mixed locations	9	28.1
Family members most frequently exposed to cigarette smoke		
School-aged children	3	8.8
Respondents	26	76.5
All family members	5	14.7
Smoking when children/toddlers are nearby		
Never	24	75
Sometimes	6	18.8
Often	2	6.2
Household rule prohibiting smoking inside the house		
Present and obeyed	2	6.3
Present but not obeyed	4	12.5
Not present	26	81.2
Family members reminding smokers not to smoke inside the house		
Never	9	28.1
Sometimes	9	28.1
Often	14	43.8
Attempt to quit or temporarily stop smoking in the last 12 months		
Yes	8	25
No	23	75
Reasons for unsuccessful quitting attempts		
Addiction/restlessness	9	28.1
Peer/work environment	2	6.3
Habit after meals/coffee	3	9.4
Others	32	56.2
Readiness to change smoking behavior		
Not willing to change	10	43.5
Willing to reduce smoking	7	30.4
Willing to quit smoking	4	17.4
At least agreed not to smoke inside the house	2	8.7
Support needed to change smoking behavior		
Family commitment	11	55
Special smoking area	3	15
Education on impacts on toddlers/children	1	5
Counseling at community health center/cessation clinic	1	5
Others	4	20

had smoked for more than six years. This pattern reflects long-term and repeated exposure to harmful cigarette substances, including nicotine, tar, and carbon monoxide, which may increase the risk of respiratory disorders, cardiovascular problems, and chronic disease among active smokers and passive smokers (Kopa-Stojak & Pawliczak, 2024). Previous evidence also shows that the number of cigarettes consumed per day and the duration of smoking are associated with declining health indicators, including increased blood pressure, reduced lung capacity, respiratory complaints, eye irritation, and poor sleep quality (Adetona et al., 2021; Agusnur et al., 2025). Therefore, the high intensity and long duration of smoking in this study indicate that household members may experience cumulative exposure over time, especially when smoking occurs near shared domestic spaces.

Household exposure to cigarette smoke was also clearly evident in this study. Although the terrace was the most common smoking location, some respondents still smoked inside the house or in mixed indoor and outdoor areas. This finding is important because smoking outside the main room does not necessarily eliminate exposure, as cigarette smoke can spread into indoor spaces and harmful residues may remain in the air, clothing, walls, and household furniture (Wu et al., 2022; Zhang et al., 2021). The absence of smoke-free home rules in most households further increases the likelihood that non-smoking family members will be exposed. This supports previous findings that cigarette smoke in domestic areas poses risks not only during active smoking but also after smoking has ended, because residual particles may persist in the home environment (Yunara et al., 2025).

Although toddlers, pregnant women, and older adults were not reported as the most frequently exposed groups, their risk cannot be ignored. Families may attempt to avoid smoking directly near vulnerable members, but indirect exposure may still occur through residual smoke on clothes, furniture, and indoor surfaces (Williams et al., 2022). This is particularly important for toddlers because even indirect exposure may increase the risk of respiratory problems, including acute respiratory infections (Jamal et al., 2022). In this study, school-aged children were also reported as exposed in several households, which requires attention because children remain vulnerable to the adverse effects of cigarette smoke in both home and public environments. This aligns with evidence that exposure among school-aged children should be continuously reduced through stronger protection from smoking sources (Syaakirah et al., 2025). Pregnant women also require protection because cigarette smoke exposure may affect both maternal and fetal health, making smoke-free home rules essential for reducing preventable health risks (Hasnah & Yulia, 2025).

The finding that spouses were the most frequently exposed group demonstrates that the health effects of smoking within families are experienced most directly by partners of smokers (Marbin et al., 2021). This reflects the close physical proximity and repeated daily interaction between spouses in the household environment. Even when children, pregnant women, or older adults are perceived as protected, partners may continue to experience regular exposure, which can contribute to long-term health risks (Chen et al., 2021; Chen et al., 2024; Han et al., 2021). In some households, all family members were reported as exposed, indicating that smoking behaviour can affect the entire domestic environment rather than only individuals who are near the smoker.

The low level of smoking cessation attempts and weak intention to quit indicate that behavioural change remains a major challenge. Only a small proportion of smokers had attempted to stop smoking in the previous year, and few clearly stated that they wanted to quit. This suggests that health promotion should not rely solely on general warnings about smoking hazards but should use gradual, family-based strategies. Such strategies may include encouraging smokers not to smoke inside the house, establishing outdoor smoking areas away from family members, developing family agreements, and strengthening the role of spouses and children in supporting smoking reduction (Bar-Zeev et al., 2021; Semple et al., 2021). The finding that some family members already reprimanded smokers when they smoked indoors indicates the presence of early social control that can be strengthened through community health education.

The economic burden of smoking is also an important implication of this study. A substantial proportion of households spent more than IDR 100,000 per week on cigarettes. For rural households, this expenditure may reduce resources for more essential needs, including nutritious food, education, and health care (Dartanto et al., 2021). Therefore, smoking prevention messages should address not only disease risk but also the economic consequences of cigarette consumption for family welfare (Sequeira et al., 2024). This approach may be more relevant for households where the main smoker is also the head of family or primary income earner.

Overall, the findings suggest that smoking behaviour in Sama Subur Village is sustained by individual dependence, long-term habit, household tolerance, and limited smoke-free rules. The study highlights the need for health promotion interventions that involve all family members rather than focusing only on smokers. Community health centers, health cadres, posyandu, and posbindu can play an important role in providing continuous education, counselling, and support for smoking cessation. Establishing smoke-free homes should be promoted as a practical and culturally acceptable strategy to protect children, spouses, pregnant women, older adults, and other household members from secondhand smoke exposure. Thus, reducing smoking within families requires both behavioural change among smokers and collective household commitment to creating healthier, smoke-free living environments.

CONCLUSION

This study concludes that smoking behavior within families in Sama Subur Village remains high, with most households having a head of family who smokes. Smoking practices were characterized by high cigarette consumption and long smoking duration, indicating a persistent habit that may increase the risk of secondhand smoke exposure among household members. The findings also show that smoking behavior is closely related to household social characteristics, particularly education level and type of occupation, which may influence knowledge, habits, and acceptance of the health risks associated with smoking.

These findings highlight the need for family-based smoking prevention and control efforts in rural communities. Health promotion should focus on increasing awareness of the dangers of smoking and secondhand smoke, encouraging smoke-free home rules, and strengthening family support for smoking reduction or cessation. Community health centers and local health cadres should play an active role in providing continuous education and counseling, especially for heads of families as the main smokers in the household. Future studies should explore the social and cultural factors that sustain smoking behavior in families and evaluate the effectiveness of smoke-free home interventions in similar rural settings.

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AUTHORS' CONTRIBUTIONS

Hartati Bahar contributed to the conceptualisation of the study, study design, supervision, and critical revision of the manuscript. Firza Azzahra contributed to data collection, data acquisition, and manuscript drafting. Desfita Maharani contributed to data analysis, interpretation of findings, and manuscript revision. Pian contributed to fieldwork implementation and participant coordination. Windi Wulandari contributed to literature review and data management. Putri Feta Sweety contributed to manuscript preparation and formatting. All authors reviewed, read, and approved the final version of the manuscript.

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COMPETING INTERESTS

The authors affirm that there are no conflicts of interest related to the research, writing, or publication of this article.

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