

Thirdhand Smoke: Are Parents Aware of It?

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Research Article

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Abstract

PURPOSE

This study aims to understand the beliefs about thirdhand smoke among parents or grandparents of children in Northern Turkey and to provide an evidence base to incorporate thirdhand smoke preventative action into tobacco control interventions.

METHODS

This cross-sectional study were collected through face-to-face interviews in a tertiary training hospital. Total of 1016 parents make assessments on the 'beliefs about thirdhand smoke' (BATHS) scale. Sociodemographic details including age, gender, education level, smoking status, personal income, exposure in the home, car or outside, type of home ownership and awareness of the term third-hand smoke were investigated. Scale assessment, univariate and multivariate analyses to explore the factors influencing the BATHS scale and awareness of the term third-hand smoke, were performed using SPSS version 22.0.

RESULTS

Participants who were grandparents, non smokers, higher incomes, those who have heard the term third-hand smoke and higher education levels were more likely to get higher scores on the BATHS scale ($p < 0.001$). The level of awareness is 8.7%. Awareness of the term third-hand smoke was associated with education (OR=18.835; 95% CI: 5.205- 68.186, $p < 0.001$), living own home (OR=2,667; 95% CI: 1.377-5.181, $p = 0.004$). Smoking status, exposure in the home, car and outside get higher BATHS score ($p < 0.001$) but not significant with awareness ($p > 0.05$).

CONCLUSIONS

Thirdhand smoke harm belief was associated with education, enforced smoke-free home and car and attempts to quit smoking. Sensitizing parents to thirdhand smoke risk could guide targeted actions for smoke-free home interventions

What's Known On This Subject

Thirdhand smoke pollutants can remain in closed environments for several days or months after tobacco has been smoked, while second-hand smoke is removed through ventilation. Children are vulnerable to Third-hand smoke in their play areas, homes, and cars.

What This Study Adds

Information about Thirdhand smoke should be included in health promotion and educational campaigns aimed at reducing smoking. Stricter rules preventing smoking in public and private settings to protect

non-smokers and children against the adverse effects of second and third-hand smoke.

Introduction

Tobacco smoke exposure (TSE) is a very severe global health problem [1]. The problem is particularly important for children, who are more susceptible to toxicity present in environments where tobacco smoking occurs [2]. It leads to numerous health problems, such as voice difficulties, upper and lower respiratory tract infections, ear infections, asthma, cardiovascular diseases, and even sudden baby death [3,4].

It is estimated that 40% of children worldwide are exposed to tobacco in their homes[5]. This exposure results not only from second-hand smoke (SHS), the passive intake of tobacco smoke, but also from the effect of third-hand smoke (THS), the waste residues created by such smoke[6-8]. These waste residues consist of some components of tobacco smoke not found in fresh smoke but that can react with toxic substances by adhering to surfaces in the environment [9,10].

The toxication caused by the accumulation of tobacco smoke on surfaces is more harmful than the smoke itself and SHS [11,12]. While exposure to SHS results from the involuntary respiration of smoke, exposure to THS occurs via involuntary respiration, swallowing, or even absorption through the skin [13,14]. THS pollutants can remain in closed environments for several days or months after tobacco has been smoked, while SHS is removed through ventilation. Indeed, some components can remain on clothing fibers for up to 19 months [15]. While adults can choose whether or not to smoke tobacco, children are vulnerable to THS in their play areas, homes, and cars [16-18]. It is important for parents to be made aware of THS, and to the best of our knowledge, no previous studies have assessed the knowledge and attitudes on the subject of families in Turkey.

Methods

The data in this cross-sectional study were collected through face-to-face interviews in a tertiary training hospital between 1 February and 1 May, 2022. The sample size was calculated at 384, with $Z_{\alpha} = 1.96$ for a 95% confidence interval, a predicted acceptable margin of error $d = 0.05$ and a 50% estimated knowledge of THS. Approval was granted by the local ethical committee.

Care-giver relatives such as parents or grandparents presenting to the pediatric clinic were included in the study. Participants were informed about the purpose of the research, the duration of the survey, the identities of the researchers, and how the data would be stored by means of a section at the beginning of the questionnaire. Written consent forms were obtained from the participants before the questionnaire was applied. The questionnaire was developed based on a scan of the relevant literature [19-20]. The accuracy and clarity of the questionnaire was first tested on 15 parents. It contained 25 questions involving sociodemographic characteristics and the Beliefs About Third-Hand Smoke (BATHS) scale and capable of being completed in a mean seven minutes [21].

Sociodemographics

The parents were asked to state their age, sex, education level, income level, whether or not they owned their own home, and their children's age and sex.

Participants' beliefs concerning THS were investigated using the BATHS scale²¹ (additional file Table S1). The validity and reliability of the Turkish-language version of the BATHS scale were investigated by Önal et al. [22]. The scale assesses the THS persistence in the environment (Factor 1) and the impact of THS on health (Factor 2). Factor 1 includes items describing THS in the built environment, capturing persistence of smoke particles, accumulation of THS, and ineffectiveness of THS reduction by means other than not smoking in the home. Factor 2 includes the health impact of THS and transmission of THS through means other than the air [21]. Participants were asked whether they strongly disagreed, disagreed, were undecided, agreed, or strongly agreed with statements coded on a scale of 1-5. Following a brief explanation of the term THS, participants were then asked whether they believed that THS was deleterious to the health of their children.

Smoking behaviors

Participants were asked the following questions about smoking:

1. Smoking status - 1) I have never smoked, 2) I smoke, or 3) I used to smoke but quit.
2. Rules regarding smoking in the home - 1) Nobody can smoke in the home, 2) smoking is only allowed on the balcony, 3) smoking is allowed in specific locations in the home (such as the living room or in front of windows), and 4) there is no rule, smoking is allowed everywhere.
3. Children's exposure to smoking in the previous two weeks in the home, outside the home (in a closed environment), and in the car was also investigated.

Statistical analyses

We checked the data and found that <10% were missing. Rows with missing data were eliminated when performing the data analyses. Data were verified for normality of distribution and equality of variances on SPSS version 22.0 software. Descriptive statistics for participant demographics were calculated. Quantitative variables are presented as mean (\pm SD) and qualitative data as frequency and percentage. The t-test/ANOVA (in case of normal distribution) or the Mann-Whitney U/Kruskal-Wallis tests (in case of non-normal distribution) were applied to evaluate differences between scale scores in terms of participant characteristics. Multivariate analysis was then conducted to explore the factors influencing the BATHS scale and subscale, using the generalized linear model. Independent variables included demographics and variables identified by univariate analysis exhibiting a statistically significant association with BATHS scores. Odds ratios, adjusted for parent gender, parent age, parental education level, and family income were calculated for each dependent variable. Significance tests were bilateral and p values <0.05 were regarded as significant for all analyses.

Results

Participant characteristics

A total of 1016 parents were included in the study. Eighty percent of the participants were women and 76.5% were mothers. Individuals defined as the 'others' group, relatives such as grandfathers and grandmothers, represented 5.1% of participants. The mean age of the parents was 35.36 ± 8.9 years (min 18, max 70); 34.2% were high school graduates and 20.7% university graduates. The mean age of the children was 72.54 ± 54.04 months (min 1, max 210), and 55.6% were girls. In terms of income, 35.5% of parents had income lower than outgoings, while 9.2% had higher income than outgoings. More than half (53.4%) of the participants owned their own homes, and 22.4% were active smokers. Evaluation showed that 21.1% of participants reported that their children had been exposed to cigarette smoke in the home in the previous two weeks, while 13.5% reported exposure to smoke outside the home, and 8.9% in the car. In terms of rules regarding smoking within the home, 32.5% of participants reported that no smoking was permitted anywhere, while 42.5% only allowed smoking on an outside balcony (either opening onto the home or closed off). In addition, 48.7% of fathers, 17.1% of mothers, and 7.7% of other relatives were smokers, while 26.9% of mothers, 30.5% of fathers, and 46.2% of other relatives had once been smokers but had subsequently quit, and 56.9% of mothers, 20.9% of fathers, and 46.2% of other relatives had never smoked. In terms of education, 17.6% of smokers and 58.1% of those who had never smoked were university graduates. Smokers constituted 15.7% of parents who owned their own homes and 30.2% of those who did not. Finally, 8.7% of participants had heard of THS. A comparison of participants' demographic data according to smoking status is shown in Table 1.

The nine-item scale's reliability as measured with Cronbach's alpha was greater than 0.90 (raw 0.916, standardized 0.923), with strong reliability in the subscales (raw/standardized Cronbach's alpha=0.896/0.916 for Factor 1, and 0.855/0.861 for Factor 2). Factor 1 includes four items related to THS persistence in the environment and Factor 2 includes five items related to the impact on health of THS (Table 2).

Higher BATHS scale scores were observed among caregivers other than parents (3.86 ± 0.65 , $p < 0.001$), and among individuals with a higher level of education (university, 4.23 ± 0.56 , $p < 0.001$), whose income exceeded their outgoings (4.12 ± 0.67 , $p < 0.001$), who had never smoked (3.99 ± 0.59 , $p < 0.001$), who owned their own homes (3.94 ± 0.66 , $p < 0.001$), in whose homes nobody was allowed to smoke (4.15 ± 0.58 , $p < 0.001$), whose children were not exposed to smoking in the home (3.89 ± 0.62 , $p < 0.001$), outside the home (3.83 ± 0.65 , $p < 0.001$), or in the car (3.84 ± 0.65 , $p < 0.001$), and who had heard of THS (4.36 ± 0.62 , $p < 0.001$). No significant difference was determined in BATHS scale scores in terms of age. Mean total scale scores were 3.75 ± 0.69 among participants aged under 30, 3.83 ± 0.70 for those aged 30-50, and 3.82 ± 0.58 for those aged over 50 ($p = 0.487$).

Linear regression analysis for the BATHS scale

Multivariable analysis using a linear regression model was performed to predict the factors affecting BATHS scale scores (Table 3). BATHS scores were found to be related to education level, income status, home ownership, no smoking being allowed in the home, and awareness of THS (Table 4).

Awareness of the term third-hand smoke

In the logistic regression model, university graduates were approximately 18 times more aware of the term THS than primary school graduates, individuals with high income were four times more aware of the term than those with low income, fathers six times more than mothers, and those who own their own homes three times more than those who did not (Table 5).

At the end of the survey, participants were given information about THS and asked whether or not it is harmful, with 83.8% responding that it is harmful, 12.2% being undecided, and 3.8% replying that it is not harmful.

Discussion

Mortality and morbidity deriving from tobacco use and exposure remain a global threat to health in the pediatric population [23]. Although smoking has decreased steadily among adults aged 18 and over in the last 50 years, the prevalence of smoking in Europe as a whole is still approximately 24%. Although public awareness of the damage to health caused by primary and secondary smoking has increased, awareness of exposure to THS, that part of the smoke remaining in the environment long after the cigarette has been extinguished, is still inadequate. Studies that commenced in 1991 under the auspices of the world's largest cigarette manufacturer and that are still being published today have shown that even if ventilation is performed after a regular eight-hour smoking period, high concentrations of nicotine, nitrosamines, and carcinogenic substances remain in the air for 12 hours, and on carpets, curtains, clothes, and wallpaper for more than two months [24].

Although one child in five worldwide is reported to be exposed to tobacco smoke, it has been emphasized that the true figure is much higher because parents under-report smoking in the home and in their cars [25]. Cigarette smoking traditionally began as male behavior and a show of strength. However, manipulation on the part of the powerful tobacco industry also encouraged women to smoke as a supposed symbol of freedom and gender equality [26]. Smoking rates across the world are still higher among men than women [27]. Starting smoking at a young age is directly correlated with low income, low education levels, and membership of the working class [28]. In agreement with the previous literature, the prevalence of smoking in the present study was 21%, with a male/female ratio of 2.81, and exposure to smoking was observed at an approximate level of 21.1%. Higher rates of starting and quitting were determined among non-parent caregivers (grandfathers and grandmothers). We attribute this to increasing age-related health and financial limitations and regret over having smoked previously.

Lower socioeconomic status, whether in terms of income or education, has been identified as a greater risk in terms of exposure to cigarette smoke [29]. This explains the lower exposure to THS observed with

the criteria of higher income, a higher level of education, and owning one's own home. In the present study, being a university graduate was associated with 18-fold higher awareness on the subject of THS, a high-income level with four-fold higher awareness, and home ownership with three-fold greater awareness.

Homes and cars today represent the principal closed areas in which children are exposed to passive smoking. Potential areas of exposure to THS include homes where smoking takes place, apartments and houses previously inhabited by smokers, and cars in which people have smoked [11,30,31]. One in three of the patients in this study reporting that smoking did not take place anywhere in the home represents the most desirable situation in terms of exposure to THS.³² Reported rates of smoking prohibition in the home and car among smokers and non-smokers were 55.1% and 64.2% in Japan, 45.6% and 61.6% in Spain, and 83.7% and 78.1%, respectively, in the USA [33-35]. Some parents in the present study smoked in either some places in the home or everywhere in the home. A study from Israel reported that 39% of smoker parents smoked on the balcony, 34.1% anywhere in the home, and 26.8% outdoors [17]. Smoking in the home, even on the balcony, impacts on children in terms of both SHS and THS. Although parents who smoke on the balcony may think that this does not harm their children because they are not present with them, the children are still exposed to toxic pollutants that adhere to their skin, hair, and clothing. Since some components of THS can remain in clothing fibers for up to 19 months, even if smoking takes place in the open air, THS can still be deleterious to babies and children if they come into contact with contaminated clothing, by being picked up, for example [15]. Smoking when children are not present only prevents exposure to SHS, and does not prevent the harmful effects of THS.

In addition, due to the restricted area involved, smoking in cars has been shown to be potentially 23 times more harmful than smoking in the home [36]. Smoking in the car may be an indirect reflection of heavy smoking at home. A recent survey from Ireland showed that one child in seven was exposed to smoking in cars [37]. Consistent with the present study, Dai et al. reported that half of smokers in Japan also smoked in their cars [38]. We think that one factor in this is that vehicles in which nobody has smoked are more popular in terms of sales, and are sold for higher prices in Turkey.

One important finding of this study is the 8.7% level of awareness of the term THS. Awareness increased in proportion to education and income, and was lower in mothers. Higher awareness was determined among individuals who did not permit smoking in the home, but no significant association was found with smoking. We think that the most important factors in this context are the lack of attention paid to THS on the radio, television and social media, the lack of eye-catching public information broadcasts, and the limited level of knowledge of the subject among research and health professionals on the subject.

Although the majority of parents knew the term THS, they replied 'I Agree' to questions regarding health and persistence. Participants with higher sociodemographic findings, such as smoking and awareness of the term THS also registered higher BATHS scores. Studies have also shown higher scores among young

parents [19,26,39]. No significant age difference was observed when the age groups were compared in the present study.

Children are particularly susceptible to diseases deriving from exposure to cigarette smoke due to their narrower airways, frequent exposure to respiratory diseases, the immaturity of their immune systems, and more frequent oxygen requirements [40].

Child health clinicians affect the beliefs of parents concerning the potential harm that THS can inflict on their children. Parents who are advised to quit smoking or to make their homes or cars smoke-free by a pediatrician are more likely to believe that THS is deleterious to their children's health [41]. However, the level of awareness of the term THS among health workers in a study from Spain was only 34.8%, showing that awareness also needs to be raised among clinicians [42].

Fathers who smoked more on a daily basis (compared to mothers) are less likely to believe that THS is harmful to children.⁴¹ In the present study, too, parents who smoked were three times less likely to believe that THS is damaging to children. In contrast, effective educational messages and counseling for parents concerning THS can help promote no-smoking guidelines and acceptance of assistance for quitting.

All health care environments must be entirely smoke-free. Bans on smoking will help protect children and the whole family against exposure to SHS and THS. It is particularly important for medically vulnerable children to visit institutions that are free of all forms of tobacco smoke contamination [41].

Limitations

This study involved a large number of participants in order to obtain sound results. However, it was performed with parents visiting our hospital's pediatric clinic. It is limited by its single-center nature, and the findings cannot be generalized to the whole country. In addition, smoking history (active smoking and exposure to cigarettes in the home or car) and their effects on health were based on self-reports. Relying on parental self-reports may lead to bias error.

Conclusions

their own homes are less aware of the adverse impacts on health of THS.

Information about THS should be included in health promotion and educational campaigns aimed at reducing smoking. Stricter rules preventing smoking in public and private settings to protect non-smokers and children against the adverse effects of SHS and THS. In addition, encouraging changes in smoking behaviors will not only protect non-smokers against the deleterious effects of SHS and THS, but will also help smokers avoid the effects of tobacco and ultimately result in smoke-free environments.

Abbreviations

BATHS The Beliefs About Third-Hand Smoke Scale

SHS	Second-hand Smoke
THS	Third-hand Smoke
TSE	Tobacco Smoke Exposure

Declarations

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Authors' contributions:

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Gülfer AKÇA and Ünal AKÇA. The first draft of the manuscript was written by Ünal AKÇA and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Ethics approval:

This study was performed in line with the principles of the Declaration of Helsinki.

Approval was granted by the Non-Interventional Clinical Research Ethics Committee of University of Health Sciences, Samsun Training and Research Hospital (2022/1/1).

Consent to participate:

Written informed consent was obtained from the parents.

Consent for publication:

The authors affirm that human research participants provided informed consent for publication.

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Tables

Table 1: A comparison of demographic data according to smoking status

Smoking Status		Yes, smoker	No, quit	Never smoked	value	P
Gender	Female	134(16.5)	223(27.4)	456(56.1)	107.678	<0.001
	Male	94(46.3)	67(33.0)	42(20.7)		
Parent	Mother	133(17.1)	209(26.9)	435(56.9)	116.823	<0.001
	Father	91(48.7)	57(30.5)	39(20.9)		
	Other	4(7.7)	24(46.2)	24(46.2)		
Education	Elementary school	73(26.3)	92(33.1)	113(40.6)	30.247	<0.001
	Middle school	53(29.3)	33(18.2)	95(52.5)		
	High school	65(18.7)	114(32.9)	168(48.4)		
	University	37(17.6)	51(24.3)	122(58.1)		
Age groups	<30 years	71(24.9)	66(23.2)	148(51.9)	15.098	0.005
	30-50 years	151(22.6)	196(29.3)	322(48.1)		
	>50 years	6(9.7)	28(45.2)	28(45.2)		
Own home	Yes	85(15.7)	171(31.5)	287(52.9)	31.001	<0.001
	No	143(30.2)	119(25.2)	211(44.6)		
Income	Income <outgoings	108(29.9)	92(25.5)	161(44.6)	19.194	<0.001
	Income=outgoings	103(18.3)	174(31.0)	285(50.7)		
	income>outgoings	17(18.3)	24(25.3)	52(55.9)		
Exposure in the car	Yes	45 (50.0)	13(14.4)	32(35.6)	43.947	<0.001
	No	183(19.8)	277(29.9)	466(50.3)		
Exposure in the home	Yes	119(55.6)	34(15.9)	61(28.5)	171.371	<0.001
	No	109(13.6)	256(31.9)	498(49.0)		
Exposure outside the home	Yes	71(51.8)	16(11.7)	50(36.5)	81.768	<0.001
	No	157(17.9)	274(31.2)	498(49.0)		

Table 2: Reliability assessment and factor analysis of Beliefs About Third-hand Smoke (BATHS) scale results among families of children in Samsun (n=1016)

Scale item	Mean±SD	Factor loadings	
		THS health	THS persistence
Breathing air in a room today where people smoked yesterday can harm the health of infants and children.	4.25±0.63	0.778	
Breathing air in a room today where people smoked yesterday can harm the health of adults.	4.06±0.79	0.791	
After touching surfaces where cigarette smoke has settled, particles can enter the body through the skin.	3.25±1.08	0.719	
After smoking a cigarette, smoke particles on skin, hair and clothing can be passed on to others through touch.	3.82±1.06	0.760	
Particles in rooms where people smoked yesterday can cause cancer.	4.19±0.69	0.688	
Smoke particles can remain in a room for days.	3.97±0.82		0.713
Smoke particles can remain in a room for weeks.	3.45±1.02		0.690
Smoke particles get absorbed into furniture and walls.	3.99±0.76		0.701
Opening windows or using air conditioners does not eliminate all smoke particles in a room.	3.67±0.92		0.655

The 9-item scale's reliability as measured with Cronbach's alpha was greater than 0.90 (raw 0.916, standardized 0.923) and strong reliability in the subscales (raw/standardized Cronbach's alpha=0.896/0.916 for Factor 1, and 0.855/0.861 for Factor 2). Factor 1 includes four items related to THS persistence in the environment and Factor 2 includes five items related to THS impact on health.

Table 3: Characteristics of participants and differences in Beliefs About Third-hand Smoke (BATHS) scale and subscale scores among families of children in Samsun in 2022 (n=1016)

Category	n(%)	THS Health mean \pm SD	p	THS persistence mean \pm SD	p	Total score mean \pm SD	p
Parent			<0.001		0.002		<0.001
Mother	777 (76.5)	3.78 \pm 0.53		3.78 \pm 0.57		3.78 \pm 0.53	
Father	187 (18.4)	3.60 \pm 0.86		3.57 \pm 0.85		3.85 \pm 0.83	
Other	52 (5.1)	3.92 \pm 0.68		3.82 \pm 0.72		3.86 \pm 0.65	
Education			<0.001		<0.001		<0.001
Elementary school	278 (27.4)	3.58 \pm 0.69		3.51 \pm 0.66		3.54 \pm 0.62	
Middle school	181 (17.8)	3.74 \pm 0.76		3.61 \pm 0.82		3.67 \pm 0.74	
High school	347 (34.2)	3.89 \pm 0.68		3.79 \pm 0.74		3.83 \pm 0.67	
University	210 (20.7)	4.24 \pm 0.61		4.22 \pm 0.57		4.23 \pm 0.56	
Income level			<0.001		<0.001		<0.001
Income lower than outgoing	361 (35.5)	3.55 \pm 0.68		3.52 \pm 0.68		3.53 \pm 0.67	
Income equal to outgoing	562 (55.3)	4.00 \pm 0.68		3.88 \pm 0.75		3.93 \pm 0.66	
Income greater than outgoing	93 (9.2)	4.15 \pm 0.72		4.09 \pm 0.70		4.12 \pm 0.67	
Smoking status			<0.001		<0.001		<0.001
Yes, smoker	228 (22.4)	3.58 \pm 0.63		3.44 \pm 0.86		3.50 \pm 0.58	
No, but smoked in the past	290 (28.5)	3.74 \pm 0.68		3.72 \pm 0.70		3.73 \pm 0.76	
No, never smoked	498 (49.0)	4.04 \pm 0.63		3.95 \pm 0.65		3.99 \pm 0.59	
Home			<0.001		<0.001		<0.001
Home owner	543	3.99 \pm 0.68		3.90 \pm 0.72		3.94 \pm 0.66	

	(53.4)			
Not home-owner	473 (46.6)	3.70±0.73	3.62±0.74	3.65±0.69
Age		0.467	0.325	0.487
<30	285 (28.1)	3.81±0.73	3.70±0.74	3.75±0.69
30-50	669 (65.8)	3.87±0.72	3.80±0.76	3.83±0.70
>50	62 (6.1)	3.82±0.64	3.82±0.59	3.82±0.58
Smoking rules		<0.001	<0.001	<0.001
Nobody can smoke in the home	330 (30.3)	4.20±0.59	4.12±0.65	4.15±0.58
Smoking only allowed on the balcony	432 (39.7)	3.68±0.60	3.62±0.63	3.65±0.55
Smoking allowed in some areas	227 (20.8)	3.70±0.87	3.57±0.82	3.63±0.82
Smoking allowed everywhere	26 (2.4)	3.57±1.05	3.50±0.98	3.53±1.00
Exposure in the home		<0.001	<0.001	<0.001
Yes	214 (19.7)	3.57±0.90	3.43±0.89	3.49±0.84
No	802 (73.6)	3.93±0.64	3.86±0.68	3.89±0.62
Exposure outside		<0.001	<0.001	<0.001
Yes	137 (12.6)	3.71±0.94	3.56±0.92	3.62±0.87
No	879 (8.5)	3.87±0.67	3.80±0.71	3.83±0.65
Exposure in the car		<0.001	<0.001	<0.001
Yes	90 (8.3)	3.52±0.92	3.34±0.93	3.42±0.86
No	926 (85.0)	3.88±0.69	3.81±0.71	3.84±0.65
Aware of third-		<0.001	<0.001	<0.001

hand smoke				
Yes	88 (8.7)	4.40±0.55	4.33±0.73	4.36±0.62
No	928 (91.3)	3.80±0.71	3.72±0.72	3.75±0.67

Table 4. Analysis of the factors influencing the beliefs about third-hand smoke (BATHS) score using a linear regression model among families of children in Samsun in 2022 (N=1016)

	B	S.E.	Beta	t	p	Lower Bound	Upper Bound
(Constant)	37.803	1.925		19.633	<.001	34.025	41.582
Education	1.082	.182	.193	5.961	<.001	.726	1.439
Income status	1.118	.331	.111	3.374	<.001	.468	1.768
Relative	-1.488	.317	-.134	-4.697	<.001	-2.110	-.866
Own home	-.871	.366	-.070	-2.379	.018	-1.589	-.152
Smoking	1.248	.235	.163	5.316	<.001	.787	1.709
Smoking rule	-.817	.237	-.107	-3.453	<.001	-1.281	-.353
Awareness of third-hand smoking	-3.026	.647	-.138	-4.680	<.001	-4.295	-1.757

Table 5. Analysis of the factors influencing awareness of THS in a logistic regression model among families of children in Samsun (N=1016)

Variable	Categories	B	S.E.	Odds Ratio	95% C.I.		p
					Lower	Upper	
Relative	Mother			1			<.001
	Father	1.776	.457	5.905	2.412	14.457	<.001
	Other	1.616	.512	5.031	1.846	13.711	.002
Education level	Elementary school			1			<.001
	Middle school	1.269	.308	3.556	1.944	6.505	<.001
	High school	1.893	.633	6.638	1.920	22.952	.003
	University	2.936	.656	18.838	5.205	68.186	<.001
Income status	Income<outgoings			1			
	Income=outgoings	.953	.317	2.595	1.394	4.830	.003
	Income>outgoings	1.453	.553	4.276	1.447	12.631	.009
Smoking status	No, never smoked			1			
	No, but used to smoke	-0.285	.440	.752	.317	1.783	.517
	Yes, smoker	-0.532	.298	.588	.328	1.053	.074
Home owner	No			1			
	Yes	-1,011	2.95	2.667	1.377	5.181	.004
Exposure to cigarette smoke in the home	Yes			1			
	No	0.349	.585	1.418	.451	4.459	.550
Exposure to cigarette smoke outside	Yes			1			
	No	0.215	.565	1.240	.410	3.755	0.703
Exposure to cigarette smoke in the car	Yes			1			
	No	-0.767	.594	.464	.145	1.487	.196