

# Associations Between Pro/Anti-Tobacco Media and Messaging Exposure and Knowledge and Support of Smoke-Free Policy Among Adults in Armenia and Georgia

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## ABSTRACT

**Context:** Despite high smoking rates, Armenia and Georgia recently adopted smoke-free policies (2022 and 2018).

**Objective:** We examined associations between exposure to pro-tobacco media (news opposing smoke-free policies; cigarette, e-cigarette, heated tobacco product [HTP] advertisements) and anti-tobacco media (media, community-based action) and (1) knowledge that the policies applied to alternative tobacco products (ATPs), and (2) support for the policies applying to ATPs and various settings.

**Design:** We analyzed 2022 survey data.

**Setting:** Data were from 28 communities in Armenia and Georgia.

**Participants:** The sample comprised 1468 adults (31.6% past-month smokers).

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The authors thank their community partners for their participation in the ongoing study and its execution.

This work was supported by the US Fogarty International Center/National Institutes of Health (NIH) (R01TW010664-01, MPLs: Berg, Kegler). Dr Berg is also supported by other US NIH funding, specifically the National Cancer Institute (R01CA215155-01A1, PI: Berg; R01CA239178-01A1, MPLs: Berg, Levine; R21CA261884-01A1, MPLs: Berg, Arem; R01CA278229-01, MPLs: Berg, Kegler), the National Institute of Environmental Health Sciences/Fogarty (D43ES030927-01, MPLs: Berg, Caudle, Sturua; D43 TW012456-01A1; MPLs: Berg, Paichadze, Petrosyan), and the National Institute on Drug Abuse (R01DA054751-01A1, MPLs: Berg, Cavazos-Rehg).

The authors have no conflicts of interest with regard to this article.

Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (<http://www.JPHMP.com>).

**Data Availability Statement:** Limited data sets are available upon reasonable request.

**Ethics Approval Statement:** The institutional review boards of Emory University (#IRB00097093), the National Academy of Sciences of the Republic of Armenia (#IRB00004079), the American University of Armenia (#AUA-2017-013), and the National Center for Disease Control and Public Health of Georgia (#IRB00002150) approved this study. All participants provided informed consent before participating in this study.

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DOI: 10.1097/PHH.0000000000001828

**Methods:** We conducted multivariable regressions, controlling for country and sociodemographics.

**Results:** Participants were knowledgeable that the policy applied to ATPs (79.2%) and supportive of them applying to ATPs and various settings (means = 3.43 and 3.00; 1–4 = strongly support). Greater exposure to anti-tobacco media/community-based action correlated with more likely knowing that the policies applied to ATPs and greater support of the policies applying to various settings; HTP advertisement exposure correlated with less support of the policies applying to various settings. Less exposure to news opposing smoke-free policies and greater exposure to media supporting such policies correlated with greater support of the policies applying to ATPs.

**Conclusions:** Media and community-based action may promote smoke-free policy knowledge and support. HTP advertisements may uniquely undermine smoke-free policies.

**KEY WORDS:** community coalition, low-income country, media, policy, tobacco

Tobacco-related diseases and deaths, including those attributed to secondhand smoke exposure (SHSe), disproportionately impact low- and middle-income countries (LMICs).<sup>1</sup> Armenia and Georgia are 2 upper-middle-income countries where tobacco use and SHSe are especially prominent.<sup>2,3</sup> Both Armenia and Georgia have populations of less than 4 million, and smoking rates are among the top 10 highest smoking rates in men globally (56.1% and 49.5%, respectively) but much lower (2.6% and 8.5%) among women.<sup>2,3</sup> Moreover, a 2022 study indicated that 69% reported past-month SHSe and 11 days of past-month SHSe on average overall.<sup>4</sup> Historically, SHSe rates were high even where smoking was prohibited.<sup>5</sup>

Although Armenia and Georgia ratified the Framework Convention on Tobacco Control (FCTC) in 2004 and 2006, respectively, until recently, they have lagged in their advancement of tobacco control, including smoke-free policies, a key tobacco control strategy.<sup>6</sup> National comprehensive smoke-free policies that applied to all alternative tobacco products (ATPs) and to a broad range of settings were implemented in Armenia and Georgia in 2022 and 2018, respectively. However, it is unclear how knowledgeable residents of these countries are regarding the nuances of the policies (eg, the types of tobacco products to which it applies) and their support of various facets of the policies (eg, settings where it applies) that may be associated with policy compliance.

Diffusion of Innovations Theory describes the process by which a new idea is communicated through certain channels over time and how populations develop an awareness of an innovation and decide to support or adopt it.<sup>7</sup> Although, historically, this theory has typically been applied to new technologies and innovations, it has served as a useful framework in public health to facilitate the diffusion of effective prevention and policy strategies, such as smoke-free air legislation.<sup>8,9</sup> One factor that may impact knowledge and support of smoke-free policies—and ultimately compliance and enforcement—is exposure to

pro- and anti-tobacco-related media.<sup>7,10</sup> In line with the Diffusion of Innovation Theory framework, the channels through which information is communicated (eg, advertisements or community coalition efforts) are important to consider, as well as how aware individuals are of something (eg, knowledge of a policy) and their support of this.

Pro-tobacco media includes tobacco advertising and other types of media promoting tobacco or opposing tobacco control. Tobacco advertising promotes positive perceptions and use of tobacco.<sup>11,12</sup> In the past 15 years, the tobacco industry has expanded to include various ATPs, including e-cigarettes and heated tobacco products (HTPs).<sup>13</sup> Tobacco products are advertised across various channels (eg, magazine/print advertising, online, point-of-sale).<sup>13,14</sup> Tobacco advertising exposure is particularly prevalent in LMICs.<sup>15,16</sup> Outside of advertising, the tobacco industry and other stakeholders often attempt to curtail advances to tobacco legislation, such as smoke-free policies, by disseminating media opposing and/or undermining such policies, by arguing against their positive effects (eg, health benefits), or by emphasizing negative effects (eg, cost to hospitality),<sup>17–19</sup> despite ample evidence supporting the positive effects and refuting the negative effects.<sup>20–23</sup>

On the other hand, anti-tobacco media, such as media campaigns promoting the adoption of smoke-free policies, is a commonly used advocacy strategy. Anti-tobacco media increases knowledge and support for tobacco legislation, including smoke-free policies, and helps to pass such legislation in high-income countries (eg, the United States,<sup>24,25</sup> Ireland,<sup>26</sup> the Netherlands<sup>27</sup>) and in LMICs (eg, Mexico,<sup>28</sup> Namibia<sup>29</sup>). In addition to the use of media, community mobilization efforts have focused on disseminating information to promote policy change, including smoke-free policy adoption,<sup>30–33</sup> but are underutilized in LMICs.<sup>31</sup>

Research conducted in Armenia and Georgia indicates that less anti-tobacco media exposure and greater pro-tobacco media exposure were associated

with less tobacco-related perceived harm to health among nonsmokers and, among smokers, being less ready to quit smoking and less likely to have made past-year quit attempts.<sup>34</sup> These associations may be, in part, due to shifts in perceptions, including risks and social norms, that may be impacted by media exposure and play key roles in influencing one's knowledge about and support for smoke-free policies, which impact policy adoption and compliance.<sup>22,23</sup>

The high rates of tobacco use and SHSe in Armenia and Georgia and the recent implementation of their national comprehensive smoke-free policies make data from these countries highly relevant to understanding smoke-free legislation. Thus, the current study examined (1) knowledge and support of smoke-free policies and the prevalence of exposure to different forms of tobacco-related media—including pro- and anti-tobacco media; and (2) how exposure to different forms of tobacco-related media may be associated with knowledge and support of these smoke-free policies.

## Methods

### Study overview

This study was approved by the institutional review boards of all participating institutions. A matched-pairs community randomized controlled trial (RCT) was used to examine the effectiveness of local coalitions in promoting smoke-free air and reducing SHSe in 28 communities in Armenia and Georgia (14 communities each). Eligible communities were those with small to medium populations (ie, 5000-60 000), given that coalitions serving small to medium communities are most effective.<sup>35</sup> Communities were paired in each country based on population size, location (eg, distance from Yerevan or Tbilisi), and local public health branch/center budget and then randomly assigned to intervention or control conditions. Notably, this study occurred when additional community-based action was being implemented through the FCTC 2030 initiative, which focuses on FCTC articles related to governance, smoke-free policies, taxation, packaging and health warnings, and advertising<sup>36</sup>; Georgia began participating in 2017 and Armenia in 2020.<sup>36</sup>

### Data collection

In each of the 28 communities, we conducted surveys (with the goal of completing 50 surveys per community) at baseline in October-November 2018 and at follow-up in May-June 2022. Current analyses focus on the surveys conducted in 2022. We obtained census data for all households within the municipality limits

from the Bureau of Statistics. The sampling strategies were different in the 2 countries due to availability of household data in Armenia (but not in Georgia) and the utility of “clusters” (ie, geographically defined areas of 150 households) in Georgia (but not in Armenia). In Armenia, addresses in each city were randomly ordered and then were visited in order until the target recruitment was reached. In Georgia, multi-stage cluster sampling was used (ie, 5 clusters per city were defined, 15 households per cluster were selected using a random walking method). At each household, potential participants were approached in person at their homes; the KISH method<sup>37</sup> was used to identify eligible participants (aged 18-64 years within). Those eligible were taken through the consent process and then administered the survey via electronic tablets.

In 2022, a total of 1140 households in Armenia were visited, of which 21.9% (n = 250) were ineligible; among the 890 eligible, 763 (85.7%) participated. In Georgia, 916 households were visited, of which 8.4% (n = 77) were ineligible; among the 839 eligible, 705 (84.0%) participated.

## Measures

### Dependent variables

**Knowledge that the smoke-free policies applied to ATPs.** Participants were asked, “From what you know, does the national ban on tobacco use in various public places also apply to e-cigarettes, heated tobacco products, and other forms of tobacco/nicotine products?” (yes or no).

**Support for policies applying to ATPs.** Participants were asked, “To what extent do you oppose or support that the national ban on cigarette smoking in various public places should equally apply to e-cigarettes, heated tobacco products, and other forms of tobacco/nicotine products?” (1 = strongly oppose to 4 = strongly support).

**Support for policies applying to various settings.** We asked, “To what extent do you support or oppose a complete cigarette smoking ban applying to: Restaurants, cafes, and cafeterias? Outdoor terraces of restaurants, cafes, and cafeterias? Bars, pubs, or nightclubs? Outdoor terraces of bars, pubs, or nightclubs? Indoor common areas of apartment or condominium complexes such as hallways, lobbies, and stairwells? Outdoor common areas of apartment or condominium complexes (playgrounds, park benches, etc)? Within individual apartment or condo units within a complex? Private vehicles when children younger than 18 years are present? Parks and beaches? Other public outdoor areas, such as open

stadiums?” (1 = strongly oppose to 4 = strongly support).<sup>38,39</sup> An average of these 10 items was calculated (Cronbach  $\alpha$  = 0.93).

### Independent variables

**Pro-tobacco messaging exposure.** *Exposure to news stories opposing smoke-free policies* was assessed by asking, “In the past 6 months, how often have you seen/noticed any news stories talking about the negative aspects of public smoke-free air policies, for example, via the Internet, social media (such as Facebook), newspapers, magazines, television, radio, signs, or leaflets?” (0 = never to 3 = frequently).<sup>38,39</sup>

To assess *tobacco product advertising exposure*, we asked, “In the past 6 months, how often have you seen/noticed any advertisements or signs promoting cigarettes [eg, via the Internet etc]?” (0 = never to 3 = frequently).<sup>38,39</sup> Participants were also asked, “In the last 30 days, have you noticed advertisements for [“e-cigarettes or vaping products” or “heated tobacco product (like IQOS)”] in any of the following places? (Check all that apply.): Web sites (eg, pop-up advertisements)? Social media (eg, Facebook)? Inside stores that sell cigarettes and other tobacco products? Outside stores that sell cigarettes and other tobacco products (including on signs in windows)? Specialty stores that sell [product]? Television? Radio? Posters, billboards, etc? Newspapers or magazines? Direct mail? E-mail?”<sup>38,39</sup> Three dichotomous variables were created (due to variable distributions) to represent those with versus without exposure to cigarette, e-cigarette, and HTP advertisements.

**Anti-tobacco messaging exposure.** *Exposure to media/messaging supporting smoke-free policies* was assessed by asking, “In the past 6 months, how often have you seen/noticed: Information about the dangers of smoking cigarettes or information that encourages quitting smoking [eg, via the Internet etc]? Information about the dangers of being exposed to the smoke of others [eg, via the Internet etc]? Any news stories talking about the harms of secondhand smoke or the importance of public smoke-free air policies in your community [eg, via the Internet etc]?” (0 = never to 3 = frequently).<sup>38,39</sup> An average of these 3 items was calculated. *Exposure to community-based activity supporting smoke-free policies* was assessed by asking, “In the past 2 years, have you seen any of the following in your community? (Check all that apply.): School-based events (eg, events to educate youth about the dangers of tobacco use and SHSe or competitions among youth to create signs promoting smoke-free policies)? Signage and/or stickers promoting smoke-free environments (eg, in public places such as public transportation or at restaurants

or hotels)? Surveys of community members (eg, on the street) regarding public support for smoke-free policies? Groups of people cleaning parks or stadiums to remove cigarette butts and promote smoke-free policies? Events/activities in health care settings (eg, circulating education about dangers of SHSe in clinics, hospitals, or COVID testing sites)? Other community-based activities (eg, distributing information about the national smoke-free policies or quitting smoking, or student (pupil) flash mobs to promote awareness of harms of SHSe?” A sum score of endorsements to these 6 items was calculated (ranging from 0 to 6).

### Covariates

**Sociodemographics and current cigarette smoking status.** Participants were coded on the basis of their country of residence and asked to report their age, sex, employment status, relationship status, and whether or not they had any children in the home. They were also asked to report the number of days of the past 30 days they smoked cigarettes; those reporting any use were coded as current smokers.

### Data analysis

We first conducted descriptive analyses to characterize participants. Then, we conducted bivariate analyses (ie, chi-square,  $t$  tests, Pearson’s correlation) to examine associations between each of the correlates of interest and the outcomes. Next, we used multilevel linear and logistic regression analyses, with random intercepts to account for the random effect of community. Given the overlap between relationship status and children in the home and the lack of significant findings for relationship status in bivariate analyses, we excluded relationship status from the models. In exploratory analyses, we also examined country-specific differences in associations; however, findings were generally consistent with the overall models, with many of the differences in findings across models suggesting reduced power due to smaller subsample sizes (see Supplemental Digital Content Tables 2 and 3, available at <http://links.lww.com/JPHMP/B236>). Thus, the presentation of findings largely focuses on results from the overall sample. All analyses were conducted in SPSS v26, and the  $\alpha$  value was set at .05.

## Results

### Participant characteristics

Refer to Supplemental Digital Content Table 1 (available at <http://links.lww.com/JPHMP/B235>) for participant characteristics by country. Table 1 provides descriptive and bivariate results characterizing

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TABLE 1 Descriptive Statistics and Bivariate Analyses Examining Correlates of Smoke-Free Policy Knowledge and Support <sup>a</sup>									
Variable	Knowledge Smoke-Free Policy Applies to ATPs			Support for Smoke-Free Policy to Apply to ATPs			Support for Smoke-Free Policy to apply to Various Settings		
	Total (N = 1468; 100%), n (%) or M (SD)	No (N = 243; 20.8%), n (%) or M (SD)	Yes (N = 925; 79.2%), n (%) or M (SD)	P	M (SD) or r	P	M (SD) or r	P	
Sociodemographics									
Country, n (%) or M (SD)				.50		<.001		<.001	
Armenia	763 (52.0)	132 (54.3)	500 (54.1)		3.26 (1.05)		2.94 (0.89)		
Georgia	705 (48.0)	111 (45.7)	425 (45.9)		3.61 (0.65)		3.06 (0.74)		
Age, M (SD), y, or r	42.92 (13.55)	42.07 (13.5)	41.66 (13.2)	.66	0.11	<.001	0.08	<.001	
Sex, n (%) or M (SD)				<.001		<.001		<.001	
Male	713 (48.6)	160 (65.8)	443 (47.9)		3.12 (1.02)		2.59 (0.82)		
Female	755 (51.4)	83 (34.2)	482 (52.1)		3.73 (0.64)		3.40 (0.60)		
Employment, n (%) or M (SD)				.23		.02		.02	
Employed	745 (63.8)	147 (60.5)	598 (64.6)		3.39 (0.93)		2.96 (0.83)		
Unemployed	423 (36.2)	96 (39.5)	327 (35.4)		3.50 (0.84)	.17	3.07 (0.80)	.28	
Relationship status, n (%) or M (SD)				.69					
Married/cohabitating	777 (66.5)	159 (65.4)	618 (66.8)		3.46 (0.90)		3.02 (0.83)		
Other	391 (33.5)	84 (34.6)	307 (33.2)		3.39 (0.91)	.93	2.97 (0.80)	.048	
Children in the home, n (%) or M (SD)				.15					
No	577 (49.4)	130 (53.5)	447 (48.3)		3.43 (0.89)		2.96 (0.83)		
Yes	591 (50.6)	113 (36.5)	478 (51.7)		3.43 (0.91)		3.04 (0.82)		
Smoking status, n (%) or M (SD)				<.001		<.001		<.001	
Nonsmoker	1004 (68.4)	120 (49.4)	646 (69.8)		3.65 (0.72)		3.33 (0.63)		
Current smoker	464 (31.6)	123 (50.6)	279 (30.2)		2.96 (1.06)		2.31 (0.74)		
Smoke-free policy knowledge and support									
Knowledge policy applies to ATPs, n (%) or M (SD)				...		<.001		<.001	
No	243 (20.8)	...	...		2.92 (1.11)		2.52 (0.84)		
Yes	925 (79.2)	...	...		3.54 (0.80)		3.09 (0.78)		
Support for policy to apply to ATPs, M (SD) or r	3.43 (0.90)	2.92 (1.11)	3.54 (0.80)	<.001	...	...	0.52	<.001	
Support for policy to apply to various settings, M (SD) or r	3.00 (0.82)	2.52 (0.84)	3.09 (0.78)	<.001	0.52	<.001	...	...	
(continues)									

(continues)

**TABLE 1**  
**Descriptive Statistics and Bivariate Analyses Examining Correlates of Smoke-Free Policy Knowledge and Support<sup>a</sup> (Continued)**

Variable	Knowledge Smoke-Free Policy Applies to ATPs			Support for Smoke-Free Policy to Apply to ATPs		Support for Smoke-Free Policy to apply to Various Settings	
	Total (N = 1468; 100%), n (%) or M (SD)	No (N = 243; 20.8%), n (%) or M (SD)	Yes (N = 925; 79.2%), n (%) or M (SD)	P	M (SD) or r	P	M (SD) or r
Pro-tobacco messaging exposure							
News stories opposing smoke-free policies, M (SD) or r	0.63 (0.88)	0.53 (0.74)	0.67 (0.94)	.03	— 0.05	.87	0.07
Cigarette advertisements, n (%) or M (SD)							
No	1076 (74.2)	191 (78.9)	700 (76.2)	.21	3.44 (0.89)	.42	3.44 (0.89)
Yes	375 (25.8)	51 (21.1)	219 (23.8)		3.39 (0.91)		3.40 (0.91)
e-Cigarette advertisements, n (%) or M (SD)							
No	956 (65.1)	139 (57.2)	606 (65.5)	.01	3.54 (0.81)	<.001	3.54 (0.82)
Yes	512 (34.9)	104 (42.8)	319 (34.5)		3.23 (1.01)		3.23 (1.01)
HTP advertisements, n (%) or M (SD)							
No	1004 (68.4)	147 (60.5)	621 (67.1)	.03	3.54 (0.82)	<.001	3.54 (0.82)
Yes	464 (31.6)	96 (39.5)	304 (32.9)		3.19 (1.01)		3.19 (1.01)
Anti-tobacco messaging exposure							
Media supporting smoke-free policies, M (SD) or r	1.21 (0.87)	1.01 (0.79)	1.33 (0.89)	<.001	0.16	<.001	0.16
Community-based action supporting smoke-free policies, M (SD) or r	1.07 (1.04)	0.85 (0.92)	1.19 (1.08)	<.001	0.14	<.001	0.14

Abbreviations: ATP, alternative tobacco product; HTP, heated tobacco product; r, correlation coefficient; SD, standard deviation.

<sup>a</sup>Bold indicates statistically significant associations. Policy support variables were measured on a scale ranging from 1 (strongly oppose) to 4 (strongly support).

our sample in relation to the 3 outcomes. In this sample ( $N = 1468$ ), the average age was 42.92 years ( $SD = 13.55$ ); 51.4% were female, 63.8% were employed, and 31.6% were current smokers.

Regarding outcomes, 79.2% were aware that the smoke-free policies applied to ATPs. Average support (1-4 = strongly support) for the policies to apply to ATPs and to various settings was high ( $M = 3.43$ ,  $SD = 0.90$ , and  $M = 3.00$ ,  $SD = 0.82$ , respectively), with 84.9% “somewhat” or “strongly” supporting the policies applying to ATPs and 59.8% “somewhat” or “strongly” supporting the policies applying to various settings. In bivariate analyses, those who correctly believed the smoke-free policies applied to ATPs were more supportive of the policies applying to ATPs and various settings ( $P_s < .001$ ). Support for the policies to apply to ATPs and to various settings was correlated ( $r = 0.52$ ,  $P < .001$ ).

Average exposure to news opposing smoke-free policies was 0.63 ( $SD = 0.88$ , on a scale of 0 = never to 3 = frequently), and the majority were not exposed to advertisements for cigarettes (74.2%), e-cigarettes (65.1%), and HTPs (68.4%). Average exposure to media supporting smoke-free policies was 1.21 ( $SD = 0.87$ , on a scale of 0 = never to 3 = frequently) and to community-based action supporting smoke-free policies was 1.07 ( $SD = 1.04$ ; sum score ranging from 0 to 6; 32.1% no exposure, 42.3% exposure to 1, and 24.5% exposure to >1).

### **Knowledge that the smoke-free policies applied to ATPs**

In bivariate analyses, those who knew the policies applied to ATPs reported greater exposure to news stories opposing smoke-free policies ( $P = .03$ ), were less likely to be exposed to e-cigarette and HTP advertisements ( $P_s < .05$ ), reported greater exposure to media and community-based action supporting smoke-free policies ( $P_s < .001$ ), and were more likely to be female and nonsmokers ( $P_s < .001$ ).

Multivariable regression analysis (Table 2) indicated that greater exposure to media and community-based action supporting smoke-free policies (adjusted odds ratio [aOR] = 1.35; 95% confidence interval [CI], 1.04 to 1.76; and aOR = 1.37; 95% CI, 1.11 to 1.70) correlated with the odds of knowing the policies applied to ATPs. Being employed (vs unemployed; aOR = 0.67; 95% CI, 0.47 to 0.97) and being a current smoker (vs nonsmoker; aOR = 0.52; 95% CI, 0.33 to 0.80) were associated with lower odds of knowing the policies applied to ATPs. Shown in Supplemental Digital Content Tables 2 and 3 (available at <http://links.lww.com/JPHMP/B236>), country-specific analyses indicated no significant

findings regarding our predictors of interest in Armenia, but greater exposure to community-based action was significant in the Georgia-specific model and greater exposure to supportive media trended in the same direction as the overall model.

### **Support for smoke-free policies applying to ATPs**

Bivariate analyses indicated that being more supportive of the policies applying to ATPs correlated with being less likely exposed to e-cigarette and HTP advertisements and greater exposure to media and community-based action supporting smoke-free policies ( $P_s < .001$ ), as well as being from Georgia, older, female, unemployed, and nonsmokers ( $P_s < .05$ ).

In multivariable analysis (Table 2), less exposure to news opposing smoke-free policies ( $\beta = -.09$ ; 95% CI,  $-0.15$  to  $-0.03$ ) and greater exposure to media supporting smoke-free policies ( $\beta = .09$ ; 95% CI,  $0.02$  to  $0.15$ ) correlated with greater support for the policies applying to ATPs. In addition, being from Georgia ( $\beta = .38$ ; 95% CI,  $0.14$  to  $0.62$ ), older ( $\beta = .004$ ; 95% CI,  $0.001$  to  $0.007$ ), and female ( $\beta = .38$ ; 95% CI,  $0.27$  to  $0.48$ ) correlated with greater support, while being a current smoker ( $\beta = -.37$ ; 95% CI,  $-0.48$  to  $-0.26$ ) correlated with less support. Shown in Supplemental Digital Content Tables 2 and 3 (available at <http://links.lww.com/JPHMP/B236>), in Armenia-specific analysis, less exposure to news opposing smoke-free policies was significant. In Georgia-specific analysis, greater exposure to media supporting smoke-free policies was significant and less exposure to opposing news trended in the same direction as the overall and Armenia-specific models.

### **Support for smoke-free policies applying to various settings**

In bivariate analyses, being more supportive of the policies applying to various settings correlated with greater exposure to news stories opposing smoke-free policies ( $P = .01$ ), being less likely exposed to e-cigarette and HTP advertisements ( $P_s < .001$ ), and greater exposure to media and community-based action supporting smoke-free policies ( $P_s < .001$ ), as well as being from Georgia, older, female, unemployed, with children in the home, and nonsmokers ( $P_s < .05$ ).

Multivariable analysis (Table 2) indicated that not being exposed to HTP advertisements ( $\beta = -.18$ ; 95% CI,  $-0.29$  to  $-0.07$ ) and greater exposure to media and community-based action supporting smoke-free policies ( $\beta = .06$ ; 95% CI,  $0.001$  to  $0.11$ ; and  $\beta = .04$ ; 95% CI,  $0.001$  to  $0.07$ ) correlated with greater support for the policies applying to various



**TABLE 2****Multilevel Regression Models Examining Associations Between Tobacco Media Exposure and Smoke-Free Policy Knowledge and Support<sup>a</sup>**

Variable	Knowledge Smoke-Free Policy Applies to ATPs			Support for Smoke-Free Policy to Apply to ATPs			Support for Smoke-Free Policy to Apply to Various Settings		
	aOR	95% CI	P	$\beta$	95% CI	P	$\beta$	95% CI	P
Intercept	4.25	1.56 to 11.53	<b>.01</b>	2.99	2.73 to 3.24	<b>&lt;.001</b>	2.799	2.59 to 3.01	<b>&lt;.001</b>
<b>Sociodemographics</b>									
Georgia (ref: Armenia)	1.18	0.48 to 2.89	.71	.38	0.14 to 0.62	<b>&lt;.001</b>	.21	0.001 to 0.41	<b>.049</b>
Age	0.99	0.98 to 1.01	.54	.004	0.001 to 0.007	<b>.02</b>	.001	−0.001 to 0.004	.36
Female (ref: male)	1.37	0.88 to 2.13	.16	.38	0.27 to 0.48	<b>&lt;.001</b>	.38	0.29 to 0.46	<b>&lt;.001</b>
Employed (ref: unemployed)	0.67	0.47 to 0.97	<b>.03</b>	−.02	−0.11 to 0.07	.68	−.05	−0.12 to 0.02	.18
No children in the home (ref: children)	1.06	0.76 to 1.48	.73	.01	−0.07 to 0.09	.83	.05	−0.01 to 0.12	.12
Current smoker (ref: nonsmoker)	0.52	0.33 to 0.80	<b>&lt;.001</b>	−.37	−0.48 to −0.26	<b>&lt;.001</b>	−.67	−0.76 to −0.58	<b>&lt;.001</b>
<b>Pro-tobacco messaging exposure</b>									
News stories opposing smoke-free policies	0.87	0.68 to 1.12	.27	−.09	−0.15 to −0.03	<b>&lt;.001</b>	.01	−0.04 to 0.06	.67
Cigarette advertisements (ref: no)	1.06	0.68 to 1.65	.80	−.03	−0.15 to 0.08	.57	.02	−0.08 to 0.11	.74
e-Cigarette advertisements (ref: no)	0.71	0.42 to 1.18	.18	−.08	−0.21 to 0.05	.20	−.01	−0.12 to 0.10	.86
HTP advertisements (ref: no)	0.97	0.57 to 1.64	.91	−.11	−0.24 to 0.03	.12	−.18	−0.29 to −0.07	<b>.001</b>
<b>Anti-tobacco messaging exposure</b>									
Pro-smoke-free media/messaging	1.35	1.04 to 1.76	<b>.03</b>	.09	0.02 to 0.15	<b>.01</b>	.06	0.001 to 0.11	<b>.046</b>
Community-based action supporting smoke-free policy	1.37	1.11 to 1.70	<b>&lt;.001</b>	.04	−0.01 to 0.09	.08	.04	0.001 to 0.07	<b>.049</b>

Abbreviations: aOR, adjusted odds ratio; ATP, alternative tobacco product; CI, confidence interval; HTP, heated tobacco product.

<sup>a</sup>Bold indicates statistically significant associations.

settings. Furthermore, being from Georgia ( $\beta = .21$ ; 95% CI, 0.001 to 0.41) and female ( $\beta = .38$ ; 95% CI, 0.29 to 0.46) correlated with greater support, while being a current smoker ( $\beta = −.67$ ; 95% CI, −0.76 to −0.58) correlated with less support. Shown in Supplemental Digital Content Tables 2 and 3 (available at <http://links.lww.com/JPHMP/B236>), significant factors in Armenia-specific analysis included greater exposure to media and community-based action supporting smoke-free policies; in Georgia, not being exposed to HTP advertisements was significantly associated.

## Discussion

The current study examined knowledge and support of smoke-free policies among adults in Armenia and Georgia, 2 LMICs with a high male smoking prevalence<sup>2,3</sup> and recent implementation of national

smoke-free policies. Results indicated that nearly 80% of participants knew that the national smoke-free policies applied to ATPs. Moreover, the majority supported the policies applying to ATPs (~85%) and to various settings (~60%). Despite Georgia's policy being in effect since 2018 and Armenia's only about 1 month prior to the survey in 2022, there were no significant differences in knowledge; however, average support for the policies to apply to ATPs and various settings was higher in Georgia than that in Armenia. According to Diffusion of Innovation Theory,<sup>7</sup> this might be expected, as observing and experiencing policy impacts, including advantages and compatibility with one's lifestyle, may increase support for the policies and their expansion. Also in line with Diffusion of Innovation Theory,<sup>7</sup> less exposure to news opposing smoke-free policies and greater exposure to media and community-based action supporting smoke-free policies were associated with greater knowledge and



support, which aligns with prior literature underscoring the significant impact of both pro-tobacco<sup>17-19</sup> and anti-tobacco media.<sup>24-29</sup>

Participants reported relatively low exposure to both pro-tobacco and anti-tobacco media. However, more than 40% reported exposure to 1 or more community-based actions promoting smoke-free policies. Notably, this study involved an RCT implementing coalitions in half of the communities, and additional community-based action was being implemented through the FCTC 2030 initiative, in which Georgia began participating in 2018 and Armenia in 2020.<sup>36</sup> In country-specific models, greater exposure to community-based action was significantly associated with knowledge that the smoke-free policies applied to ATPs in Georgia but not in Armenia. In contrast, greater exposure to community-based action was associated with support for the policies to apply to various settings in Armenia but not in Georgia. Further research is needed to disentangle these findings; however, this may be related to Georgia participating in the FCTC 2 years before Armenia and the possibility that people may first be impacted by the number of places smoke-free policies cover and then the nuances regarding the ATPs that the policies cover.

Regarding tobacco advertising, in bivariate analyses, e-cigarette and HTP advertisement exposure correlated with less support of the smoke-free policies applying to ATPs and various settings. However, there was no association between cigarette advertisement exposure and knowledge or support, which may be due to cigarette advertising being less salient, given the less novel nature of the product relative to e-cigarettes and HTPs.<sup>34</sup> In multivariable analyses, only the association between HTP advertisement exposure and lower support for the policies to apply to various settings remained significant after adjusting for other variables. Given the targeted marketing tactics the tobacco industry performs (ie, targeting tobacco users who often represent disproportionately impacted minority populations<sup>13,16,40</sup>), it is plausible that the associations between tobacco advertising exposure and knowledge/support of the policies may be, in part, accounted for by current smoking status. Indeed, current smokers were less knowledgeable and supportive of the smoke-free policies, in line with prior research in Armenia and Georgia,<sup>41</sup> as well as in other countries.<sup>42</sup>

In terms of sociodemographic correlates, being female was associated with greater support for the policies applying to ATPs and various settings and being older was associated with greater support for the policies applying to ATPs. These findings align with

prior findings in these 2 countries<sup>41</sup> and elsewhere.<sup>42</sup> In addition, those who were employed were less knowledgeable about the policies applying to ATPs; this finding may reflect that those who work outside the home may experience greater exposure to noncompliance among individuals using ATPs.

First, findings underscore the utility of media and community-based action in undermining or supporting smoke-free policies and suggest that policies restricting tobacco advertising may assist in garnering support for and expanding smoke-free policies. Although tobacco advertising restrictions are effective in reducing tobacco consumption, they are unfortunately less common in LMICs.<sup>43</sup> Moreover, given the impact of pro- and anti-tobacco messaging, it is crucial to identify the most effective messaging strategies. For example, prior research in Armenia and Georgia documented that the most compelling messaging in support of smoke-free policies focused on the right to clean air and health consequences of SHSe, while the most compelling anti-policy messaging focused on using smoking/nonsmoking sections and consumers' responsibility to guard against SHSe.<sup>41</sup> It is also important to consider the potential impact of who is delivering the messaging (eg, tobacco industry, community members, government-sponsored) and the channels by which information is communicated (eg, social media, news, direct communication).<sup>10</sup> Finally, prior research indicates that having more smoke-free restrictions may lead to lower rates of youth initiation, greater cessation rates and quit attempts among smokers, and lower overall rates of tobacco use,<sup>20-23</sup> thus highlighting the need to monitor these outcomes in Armenia and Georgia over time.

### Limitations

While the cities involved in this study account for about one-third of each country's population, participants may not be representative of each country's population, particularly because the larger cities were not included. In addition, recruitment methods differed between Georgia and Armenia; thus, sample compositions may have differed by key factors. Analysis did not control for intervention condition because one of the main independent variables (ie, exposure to community-based action) captured these activities, which occurred in intervention and control communities. Although Armenia's and Georgia's smoke-free policies apply to different places (eg, Armenia's policy applied to outdoor areas of restaurants and bars, while Georgia's policy applied to outdoor stadiums), we used a single index score representing average support for various settings, which was justified, given

## Implications for Policy & Practice

- Media and community-based action may be used to undermine or support smoke-free policies; restricting tobacco advertising may assist in smoke-free policy adoption, expansion, and support.
- Identification of effective tobacco messaging strategies is critical to support tobacco control efforts, particularly in LMICs.
- Tobacco control efforts should also consider the source of information (industry, community members, government-sponsored) and how it is delivered (social media, news, direct communication).

the high internal consistency of the measure. Other limitations include some effect sizes being small, potential recall bias due to self-report assessments, and the cross-sectional nature of the study precluding assessment of causality. Despite these limitations, the current study provides essential information regarding associations between tobacco media exposure and smoke-free policy knowledge and support in 2 LMICs with high smoking and SHSe rates. Although results may not be generalizable to all LMICs, these cross-country findings are important to consider in the context of implementing national smoke-free policies.

## Conclusions

Knowledge and support of smoke-free policies with regard to their application to ATPs and various settings were high among Armenian and Georgian adults. Exposure to media both opposing and supporting smoke-free policies, as well as to community-based action in support of such policies, was associated with knowledge and support of the policies. Given the effectiveness of smoke-free policies in reducing SHSe and tobacco use incidence, prevalence, and mortality,<sup>6</sup> future tobacco control efforts may benefit from implementing and evaluating media campaigns using a range of messaging strategies, as well as community mobilization efforts (eg, coalitions), to bolster knowledge and support for smoke-free policies and their expansion.

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