



Impact of Physicians' Perception of Social Determinants of Health (SDoH) on the Practice of Lifestyle Medicine. Findings From a Family Physicians Survey

Abstract: *Lifestyle Medicine emphasizes evidence-based lifestyle changes to address chronic conditions. Yet, concerns have emerged regarding its ability to address broader social determinants of health (SDoH). This study examines how family physicians' perceptions of SDoH relate to their use of lifestyle medicine competencies. This cross-sectional survey was administered to 5770 family physicians. Participants rated the importance of LM core competencies and the impact of community conditions on patient health. Data analysis involved descriptive statistics, factor analysis, regression models, and t-tests. This study encompassed 447 responses. The findings revealed that while respondents recognized the effect of certain SDoH, such as access to unhealthy food (89%), alcohol (86%), and tobacco (83%), they showed less awareness of factors*

like racism and discrimination (53%), and access to parks (56%) or education (60%). Gender and the level of social deprivation in their area were significant factors influencing respondents' perception of SDoH impact.

address this gap and ensure equitable care.

Keywords: lifestyle medicine; family physicians; social determinants of health (SDoH); racism and discrimination

 **“Family physicians in higher SDI areas may have more interest or involvement in SDoH, social justice, and health equity.”** 

Additionally, those who valued and used lifestyle medicine core competencies were more likely to acknowledge the influence of SDoH on patient health. Our findings suggest that comprehensive education on SDoH, especially with a focus on community aspects, is crucial across all levels of medical training to

Lifestyle medicine is a medical specialty that focuses on evidence-based, whole-person, lifestyle change to prevent, treat, and reverse chronic conditions. The 6 pillars of lifestyle medicine include (1) a whole-food, plant-predominant eating pattern, (2) physical activity, (3) restorative sleep, (4) stress

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management, (5) avoidance of risky substances, and (6) positive social connections.¹ Modifiable behavioral risk factors, such as tobacco use, poor diet and physical inactivity, alcohol consumption, and illicit drug use, account for the majority of preventable deaths,^{2,3} positioning lifestyle medicine as an essential approach to address the worldwide chronic disease epidemic.⁴

However, some have questioned lifestyle medicine's ability to promote behavior change on a large enough scale to impact population health meaningfully and have suggested that it may exacerbate health inequities.⁵ Critiques also viewed that Lifestyle medicine is focused on individual-level care and does not sufficiently prioritize addressing the upstream social determinants of health (SDoH).⁵ The SDoH are the conditions in the environment where people are born, grow, live, work, and age that affect individuals' health, functioning, and quality of life outcomes and risks. These conditions can be related to economic stability, access to and quality of education, access to and quality of healthcare, the neighborhood and built environment (physical surroundings such as buildings, parks, infrastructure, and transportation systems),⁶ and social and community context.⁷ The community-engaged lifestyle medicine framework, which incorporates community engagement, cultural competency, and multilevel and intersectoral approaches, may be a model that can expand the impact of lifestyle medicine into at-risk populations and avoid the potential unintended consequences of exacerbating health inequities.⁸ This model is more in line with behavioral science, which indicates that behavior is "regulated" by social conditions, and it is difficult to change behavior through individual-level interventions alone.⁹

Family physicians are an important group of lifestyle medicine practitioners, as evidenced by the popularity of lifestyle medicine continuing medical education (CME) courses among family physicians. Between 2021 and 2023 alone, approximately 1650 family physicians attended the Lifestyle Medicine CME course offered by the American Academy of Family Physicians (AAFP), according to AAFP internal records. Previous research shows that family physicians value interventions that address the upstream SDoH, and they could be valuable champions for connecting traditional lifestyle medicine approaches with more community-engaged approaches.¹⁰ However, previous research also indicates that a lower proportion of family physicians are engaged in community-based lifestyle medicine competencies, and the gap between perceived value and engagement is greater compared to clinical-based lifestyle medicine competencies.¹⁰ Increasing family physicians' engagement in these community-based lifestyle medicine interventions may be an important step towards enacting approaches to behavior change that are more in line with behavioral science.^{11,12} The purpose of this study is to begin to examine why these gaps exist by analyzing the relationship between family physicians' perceptions of the impact of SDoH on their patients and their perception and use of lifestyle medicine core competencies. The objectives of this study are to:

1. Explore how sociodemographic and community factors are associated with family physicians' perception of the importance of the SDoH on their patients' health.
2. Explore how family physicians' perception of the importance of the SDoH on their patients' health

is associated with their perception and use of lifestyle medicine core competencies.

Methods

Study Design and Data Collection

This study was a cross-sectional survey of practicing family physicians who were members of the AAFP. The survey was conducted as part of the project "Family Physicians Incorporating Lifestyle Medicine into Everyday Practice" funded by Ardmore Institute, and approved by the AAFP Institutional Review Board, Protocol Number 20-400. The survey was administered between February and April 2021 and used both mail and online questionnaires. The survey was mailed to 5770 family physicians. Among these, 4498 also received an email and up to 2 reminders for the online questionnaire. After removing duplicates and respondents who did not provide consent, a total of 447 responses were included in the analysis. Written informed consent was obtained from all survey participants.

The survey aimed to assess family physicians' perception of the importance of lifestyle medicine core competencies for improving patient health and the extent to which these competencies are used in practice. The findings were initially intended to tailor Continuing Medical Education on Lifestyle Medicine. Therefore, the survey focused on 9 competencies, despite the American College of Preventive Medicine recommending 15 LM-related core competencies for practicing primary care physicians, categorized under leadership, knowledge, assessment skills, management skills, and use of office and community support.¹³ For this study, we included 8 out of the 9 competencies. The excluded competency was related to management skills, and it did not

clearly fit into the clinical and community categories and negatively affected Cronbach's alpha during factor analysis. Participants were asked to rate the importance of these core competencies using a four-point scale from "not at all important" to "very important" scored between 1 to 4. Participants were also asked whether they practiced these core competencies "regularly or some of the time."

The survey also assessed family physicians' perception of how eleven different community conditions or SDoH affect their patients' health. Participants rated the importance of each individual community condition on a four-point scale from "to no extent" to "to a great extent" and scored between 1 to 4. The survey questions along with the list of included competencies can be found in the questionnaire ([Supplemental material 1](#)).

The study linked the sociodemographic characteristics of respondents from the AAFP database using their AAFP ID. The study used the 2015 Social Deprivation Index (SDI) at the ZCTA level and matched the SDI scores with the zip codes collected during the survey.¹¹ The SDI scores were based on 7 demographic characteristics: poverty, education, single-parent households, rental housing, overcrowding, households without cars, and unemployment. The composite scores ranged from 1 to 100, the higher score indicating more significant social deprivation.¹⁴

Data Analysis

Statistical analysis was conducted using Stata version 16.1.¹⁵ Respondents' sociodemographic characteristics were summarized using descriptive statistics. Statistical significance was set at a P -value of $< .05$.

Respondents' Perception of the Effect of Social Determinants of Health on Patients' Health

Respondent's perception of how SDoH affects their patients' health

was converted from a four-point scale to a binary variable (to no or little extent vs to a moderate or great extent). The percentage of respondents who considered SDoH to affect their patients' health to a moderate or great extent was calculated for each of the 11 items under this category. Additionally, a mean composite score was calculated for the 11 items by taking their average. The mean composite score ranged from 1 to 4. The reliability of the mean composite score was measured using Cronbach's alpha, resulting in a score of 0.90. Higher mean composite scores indicated that respondents perceived that SDoH had a greater impact on their patients' health. Linear regression was used to assess how respondents' sociodemographic factors affected their overall perception of the impact of SDoH on their patients' health. A multiple linear regression model included variables with a P -value of .05 or less in bivariate analysis.

Respondents' Perception of Lifestyle Medicine Core Competencies. The relationship between respondents' perception of the impact of SDoH on their patient's health and their perception of LM core competencies was assessed. For ease of analysis, principal component factor analysis was used to reduce the 8 LM core competencies into 2 sets of correlated variables, also known as factors. (For details on the factor analysis, please refer to the [supplemental material 2](#)).

Factor 1 mainly comprised community competencies, and factor 2 comprised clinical competencies. Composite mean scores were created for the clinical and community competencies separately based on the mean of the items included in each factor. The composite scores were then changed into binary composite variables. A score of 3 or above represented the perception of LM

core competencies as "important or very important" while a score less than 3 represented the "less than important" perception.

Relationship Between Lifestyle Medicine Core Competencies and Social Determinants of Health. The mean difference in the composite score for respondents' perception of the effect of SDoH on their patients' health was calculated between those who rated clinic and community-based LM core competencies as "important or very important" vs "less than important." A two-sided t test was used to calculate the mean difference. For the adjusted model, a new dummy variable was created to predict the multivariate regression model using STATA's predict command, and then a t test was applied. The multivariate model adjusted for the gender and social deprivation index since they were associated with respondents' perception of the effect of SDoH on patients' health. The mean difference was also calculated for the use of individual LM core competencies using t -tests in both bivariate and adjusted models.

Results

Respondent Characteristics

This study included responses from 447 participants. Respondents were evenly split between males (51%) and females (49%). About a third of respondents were less than 45 years of age (32.5%), while 52.8% were 45 to 65 years of age, and 14.7% were over 65 years of age. Seventy-six percent of the respondents had been practicing family medicine for 8 or more years after residency. Most respondents were U.S. or Canadian graduates (88.6%), and 84% held M.D. degrees. A large majority were located in an urban area (80.0%) compared to a non-urban area (20.0%). A small portion of respondents had board certification

in lifestyle medicine (2.8%), a degree in public health (6.3%), a certification as a health coach (17.6%), or another related medical field (13.9%) in addition to their MD or DO degree. Respondents were almost equally distributed to areas with a very high to very low social deprivation index. (Table 1).

Respondents' Perception of the Effect of Social Determinants of Health on Patients' Health

Table 2 shows the percentages of respondents who thought that SDoH affected their patients' health to a moderate or great extent. A greater number of respondents thought the availability of unhealthy food (89.2%), easy access to alcohol (85.9%), and tobacco (82.6%) had a higher impact on patient health. A comparatively lower number of respondents perceived the importance of racism and discrimination (52.6%), access to parks, open spaces for physical activity (56.2%), health literacy (60.7%), and educational opportunity (60.1%).

Relationship Between Respondent Characteristics and Perception of the Effect of Social Determinants of Health on Patients' Health

Table 3 shows the relationship between respondents' sociodemographic characteristics and their perception of the impact SDoH has on their patients' health. In the bivariate analysis, being male ($P < .001$), having practiced medicine for 8 or more years ($P = .02$), and living in a less socially deprived area ($P = .01$ for SDI 25-49, $P = .004$ for SDI 50-74, and $P < .001$ for SDI 75-100) had statistically significantly lower mean composite scores. However, after adjusting for gender, age, experience, training, and SDI score, we found a statistically significant relationship with only gender ($P = .001$) and an SDI score

of 75-100 ($P = .001$). These findings suggest that gender and social deprivation are factors that affect the perception of the impact of SDoH on patients' health.

Relationship Between Respondent's Perception of the Effect of Social Determinants of Health on Patients' Health and Their Perception and Use of Lifestyle Medicine Core Competencies

Table 4 shows the association between respondents' perception of the impact of SDoH on their patient's health and their perception and use of LM core competencies. The findings show that respondents who perceived and used the clinical and community LM core competencies as important or very important also viewed the SDoH as more impactful on their patients' health. After adjusting for gender and SDI, statistically significant associations were found for the perceived importance of clinical LM competencies (0.41, $P < .001$) and community-based LM core competencies (mean difference 0.51, $P < .001$), as well as the use of: performing a history and physical exam specific to lifestyle-related health status (0.16, $P = .003$), counsel patients using behavioral modification techniques (mean difference 0.37, $P < 0.001$), tailor care and recommendations to the patient context (0.38, $P < .001$), assist patients in self-managing their behaviors and lifestyles and using evidence-based, achievable, specific written plans (0.32, $P < .001$), use appropriate community referral resources that support the implementation of healthy lifestyle (0.33, $P < .001$), Partner with public health and community-based organizations to share information, coordinate services, and build shared capacity for chronic disease prevention (0.011, $P < .001$), and advocate for policies that would improve community conditions

that influence patient and population health (0.21, $P < .001$).

Discussion

Our survey findings underscore a significant gap in family physicians' awareness of the impact of SDoH on patient well-being. While the majority of respondents recognized the influence of factors like access to health-damaging products such as unhealthy food, alcohol, or tobacco, fewer recognized the importance of the built and social environment, and even fewer grasped the detrimental effect of racism and discrimination on health outcomes. This lack of awareness is concerning, given global evidence showing that individuals facing inadequate living conditions and discrimination tend to have more health issues and shorter life spans.¹⁶ Moreover, racism and discrimination exacerbate mental and physical health outcomes as well as healthcare utilization.^{17,18}

The awareness of SDoH may be influenced by exposure to these issues in the community or individuals' personal lives as we found a statistically significant association between gender and the SDI scores and the perception of the impact of SDoH on patients' health. Physicians practicing in areas with lower SDI scores might be less aware of issues such as built and social environments or racism, likely due to encountering them less frequently compared to those in areas with higher SDI scores. Additionally, family physicians in higher SDI areas may have more interest or involvement in SDoH, social justice, and health equity. Upon further analysis, we found that the gap in perception between those practicing in the highest and the next SDI score areas is even wider concerning the built environment and social factors compared to access to unhealthy food or substances (See

Table 1.

Frequency Table of Respondent Sociodemographics (N = 447).

Physician, Practice, and Community Characteristics	Total N (%)
Gender	
Male	221 (51.0)
Female	212 (49.0)
Age	
Less than 45 years	139 (32.5)
45-65 years	226 (52.8)
Over 65 years	63 (14.7)
Years since residency	
7 or less	105 (24.0)
8 or more	332 (76.0)
Medical school location	
International graduates	50 (11.4)
Graduates from US/Canada	387 (88.6)
Medical degree	
MD	367 (84.0)
DO	70 (16.0)
Area of practice	
Urban	305 (80.0)
Non-urban	76 (20.0)
Formal training/certification	
Board certification in lifestyle medicine	12 (2.8)
Certified health coach	76 (17.6)
Public health degree (MPH, DrPH, PhD in public health)	27 (6.3)
None of the above	325 (75.4)
Other ^{a)}	60 (13.9)
Social deprivation index (ZCTA)	
Very high (75-100)	78 (20.2)
High (50-74)	94 (24.4)
Low (25-49)	92 (23.8)
Very low (0-25)	122 (31.6)

^{a)}Include exercise specialists, dietitians, sports medicine, integrative medicine, obesity medicine, culinary medicine.

supplemental material 3). Similarly, women physicians are more likely to recognize the impact of SDoH, possibly because they tend to spend more time with patients, fostering deeper relationships.^{19,20} This could be attributed to women being more likely to experience these impacts themselves and having perceived better skills and empathy in patient perception, bedside manner, and communication skills.^{20,21}

The findings of this study highlight the vital role of SDoH as “risk regulators” that shape the opportunities and constraints for individuals seeking to adopt healthy behaviors.²² Hence, it is not surprising that respondents holding a certification in lifestyle medicine scored higher on the SDoH composite measure, given the emphasis on behavior change in this field. Although the difference in scores between certified and non-certified participants was not statistically significant, it may be due to the limited number of respondents holding this certification.

Upon accounting for covariates, our analysis revealed a positive association between respondents’ perception of the impact of SDoH on patients and their perceived importance of clinical and community lifestyle medicine competencies, as well as their utilization of such competencies (except for 1 clinical competency which was to order and interpret LM-related tests). This suggests that individuals who endorse the principles of lifestyle medicine are more likely to acknowledge the influence of SDoH on their patient’s health. These findings build upon our earlier observation that respondents with a lifestyle medicine certification had a slightly higher, albeit statistically non-significant, SDoH composite score. It indicates that individuals who appreciate the value of lifestyle medicine but lack formal training in

Table 2.

Percentage of Respondents Who Perceived Social Determinants of Health to Have a Moderate to Great Effect Their Patients' Health.

Social Determinants of Health Included in the Survey (N = 361)	To a Moderate or Great Extent (%)
Availability of unhealthy food	89.2
Easy access to alcohol	85.9
Easy access to tobacco	82.6
Availability of healthy food	71.8
Safe and affordable housing	69.0
Job opportunities	69.0
Access to reliable transportation	64.5
Health literacy	60.7
Educational opportunities	60.1
Access to park, open spaces, and bicycle/walking lanes	56.2
Racism and discrimination	52.6

it still recognize the significance of SDoH in promoting their patient's health.

Our data showing a relationship between the perceived impact of SDoH on patients and the perceived importance of LM competencies in general, with or without certification, highlights the need for incorporating education regarding both SDoH and LM, with a strong focus on community components such as linking to community resources or community advocacy across all levels of medical training including medical school, residency, and Continuing Medical Education (CME) to enhance patient outcomes. Presenting a biological basis for health disparities may be beneficial for family physicians whose background comes from the basic sciences. Hence, there is a need for more education and

awareness on how racism and discrimination can have a direct impact on health through the allostatic load, or the "wear and tear on the body resulting from ongoing and repeated stress."²³ Particularly, male physicians may require additional attention to better understand and respond to the impact of SDoH on patient health.

Despite the importance of addressing SDoH, the current American College of Lifestyle Medicine (ACLM) core competencies inadequately prioritize upstream approaches to health promotion. The upstream approaches focuses on addressing the root causes of health inequities, such as living conditions, and institutional and social inequities.²⁴ Research underscores the necessity of improving social conditions for equitable improvements in lifestyle

and chronic disease prevention.²⁵ Integrating individual-level interventions typical of LM with public health approaches may offer the most successful approach to chronic disease prevention across populations.²⁶ Lifestyle medicine education should also differentiate between patient's social needs which occur at the individual level and social determinants of health that manifest at the community, policy, and governance levels.^{27,28}

Challenges such as difficulty in changing patient behavior, limited time, lack of incentive or reimbursement, an insufficient workforce to navigate patients to community resources, or unavailable, inadequate, or difficult-to-access community resources hinder efforts to address SDoH and practicing lifestyle medicine.^{10,29} Addressing these issues alongside physician education is essential.

Implementing routine SDoH screening in practice can help ensure individuals in lower SDI score areas are not overlooked.

Limitation of the Study

The survey data used in this study did not have data on physicians' race which might have an impact on the perception of the importance of SDoH. For instance, A 2022 survey of America's physicians found that physicians of color (Asian, Black, and Hispanic) reported a higher percentage of patients experiencing financial instability, and food insecurity compared to their white counterparts.²⁹ Likewise, the percentage of physicians with public health degrees was significantly less, which did not allow us to examine whether a better understanding of public health could affect their perception of SDoH. Future research should aim to incorporate these variables to provide a more nuanced understanding of healthcare

Table 3.

Association Between Physician, Practice, and Community Characteristics and Perception of the Impact Social Determinants of Health Have on Their Patients' Health.

Characteristics	Composite Score for the Perception of the Impact Social Determinants of Health Have on Their Patient's Health					
	Bivariate Analysis			Multivariate Analysis		
	N	Mean Composite Score (SD)	P	N	Adjusted Mean Composite Score (SD)	P
Gender						
Female	354	3.17 (0.57)	Ref	298	3.17 (0.15)	Ref
Male		2.84 (0.66)	<.001		2.87 (0.14)	.001
Age						
<45	346	3.10 (0.68)	Ref	298	3.12 (0.20)	Ref
45-64		2.96 (0.64)	.08		2.98 (0.20)	.98
>65		2.89 (0.58)	.07		2.91 (0.19)	.86
Year since residency						
New (7 or less years)	354	3.14 (0.70)	Ref	298	3.17 (0.18)	Ref
Experienced (8 or more years)		2.96 (0.62)	.02		2.97 (0.19)	.36
Place of graduation						
International graduates	354	3.00 (0.80)	Ref			
Graduates from US/Canada		3.00 (0.62)	.99			
Degree						
MD	354	3.00 (0.65)	Ref			
DO		3.01 (0.61)	.85			
Area of practice						
Urban	310	3.01 (0.66)	Ref			
Non-urban		3.00 (0.51)	.90			
Training						
No additional training or unknown	340	2.96 (0.65)	Ref	298	2.97 (0.20)	Ref
LM training		3.23 (0.46)	.31		3.08 (0.18)	.54
Other training ^a		3.08 (0.10)	.10		3.09 (0.20)	.35
Social deprivation index (score)						
0-24	331	2.79 (0.68)	Ref	298	2.85 (0.16)	Ref
25-49		3.03 (0.63)	.01		3.03 (0.15)	.07
50-74		3.06 (0.62)	.004		3.03 (0.16)	.11
75-100		3.24 (0.57)	<.001		3.24 (0.16)	.001

^a(Such as health coach, diabetes educator, exercise specialist, dietician/nutritionist, public health degree).

Table 4.

Association of Family Physician’s Perception of the Importance of and Use of Lifestyle Medicine Core Competencies With Perception of the Importance of Social Determinants of Health (SDoH).

	Composite Score for the Perception of the Impact Social Determinants of Health Have on Their Patient’s Health					
	Bivariate Analysis			Multivariate Analysis***		
	N	Mean Difference (95% CI)**	P	N	Adjusted Mean Difference (95% CI)**	P
Perception of lifestyle medicine core competencies*						
Clinical lifestyle medicine competencies	354	0.41 (0.12, 0.70)	.006	315	0.41 (0.32, 0.50)	<.001
Community-based lifestyle medicine competencies	347	0.51 (0.35, 0.67)	<.001	310	0.51 (0.46, 0.56)	<.001
Use of clinical lifestyle medicine competencies						
Perform a history and physical exam specific to lifestyle-related health status	354	0.15 (−0.14, 0.45)	.3	315	0.16 (0.05, 0.26)	.003
Order and interpret tests to screen, diagnose, and monitor lifestyle-related diseases	354	0.04 (−0.26, 0.33)	.81	315	0.04 (−0.07, 0.14)	.5
Counsel patients using behavioral modification techniques	354	0.37 (0.07, 0.67)	.02	315	0.37 (0.26, 0.47)	<.001
Tailor care and recommendations to the patient context	354	0.38 (−0.01, 0.76)	.06	315	0.38 (0.24, 0.51)	<.001
Assist patients in self-managing their behavior and lifestyles using evidence-based, achievable, specific written plans	354	0.32 (0.14, 0.50)	<.001	315	0.32 (0.26, 0.38)	<.001
Use of community-based lifestyle medicine competencies						
Use appropriate community referral resources that support the implementation of healthy lifestyles	354	0.33 (0.17, 0.49)	.001	315	0.33 (0.28, 0.39)	<.001
Partner with public health and community-based organizations to share information, coordinate services, and build shared capacity for chronic disease prevention	354	0.11 (−0.04, 0.25)	.15	315	0.11 (0.05, 0.16)	<.001
Advocate for policies that would improve community conditions that influence patient and population health	354	0.21 (0.07, 0.36)	.004	315	0.21 (0.16, 0.26)	<.001

Notes: *Clinical and community-based lifestyle medicine competency factors were identified using Principal component analysis. Mean composite scores were created based on the mean of the items included in each factor. A binary variable for the perception of LM competencies was created splitting responses into those that perceived lifestyle medicine core competencies to be important/very important and less than important.

** The mean difference in composite scores is calculated as the difference in mean composite scores of family physicians’ perception of the impact social determinants of health have on their patient’s health between respondents that perceived lifestyle medicine core competencies to be important/very important and less than important, as well as respondents that practiced lifestyle medicine core competencies regularly or somewhat regularly compared to those that did not practice.

*** Multivariate analysis adjusts for gender and social deprivation index (sdi) score.

professionals' awareness and responses to SDoH.

Conclusion

Physicians who understand the importance of SDoH in their patients' health generally practice lifestyle-related core competencies more regularly. They are even better at practicing community-related core competencies such as using community referral resources, partnering with public health and community-based organizations, and advocating for policies to improve community conditions. However, fewer physicians understand the importance of built or social environment or the effect of racism and discrimination on health outcomes. The understanding or awareness of these community and social factors is highly influenced by the exposure to these issues in the community or individuals' personal experiences. This emphasizes the need for comprehensive education on SDoH with a focus on community components across all levels of medical training and practice.

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Author Contributions

RB contributed to the survey instrument design, data analysis, and manuscript write-up and was the primary author. KK designed the study, contributed to the survey instrument design, data analysis, and manuscript write-up and editing. PS assisted with the survey instrument design, and manuscript review and editing. EP assisted with the survey instrument design, and manuscript review and editing.

Declaration of Conflicting Interests

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Ethical Statement

Ethical Approval

Ethical approval was obtained from the American Academy of Family Physicians (AAFP) Institutional Review Board under Protocol Number 20-400.

Informed Consent

Written informed consent was obtained from all survey participants.

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Supplemental Material

Supplemental material for this article is available online.



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