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Original Article

Knowledge, Attitude, and Practice Regarding Pap smear Among Medical Workers in Sulaimani City/ Iraq

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ABSTRACT

Background

One of the most prevalent malignancies in women worldwide is cervical cancer. It is essential to make sure a sizable portion of the target population is routinely checked since Pap smears, a medical screening technique, can detect women with pre-cancerous lesions in the asymptomatic population before they reach the invasive stage.

This study aims to assess the level of knowledge, attitudes, and practices of medical workers regarding Pap smear test, and roll out the barriers to performing Pap smear test.

Methodology

A cross-sectional study was conducted with a convenient sampling of 300 participants among medical staff in Shar Hospital, Teaching Hospital, Dr. Jamal Hospital, Smart Health Tower, Anwar Sheikh Medical Center, Harem, and Asia Hospitals in Sulaimani, Kurdistan region, Iraq, from November 1, 2023, to April 1, 2024.

Results

Out of 300 participants, only 21.7% scored good knowledge, with the majority (62.3%) having a poor knowledge score. Most participants had a positive attitude toward Pap smear screening and recognized its role in the early detection of cervical cancer. However, regular screening practice was low. There was a statistically significant correlation between education level and knowledge score. Among participants who have not undergone a Pap smear, the main reported barrier was inadequate knowledge, in addition to embarrassment, fear of pain, fear of positive results, and husband's disapproval.

Conclusion

The respondents showed inadequate knowledge and low screening practice regarding Pap smear testing, despite generally positive attitudes. Educational level was significantly associated with knowledge. Strengthening health education initiatives and utilizing media platforms are essential to improve awareness. Healthcare professionals should actively promote cervical cancer screening, and efforts should be made to improve access to affordable and confidential services.

Keywords: cervical cancer, Pap test, screening, HPV.

1 Introduction

Background

Cervical cancer is the fourth most common cancer in women globally [1]. The burden of cervical cancer in developing countries is still high. More than 80% of cervical cancer cases are found in developing and low-resource countries, according to World Cancer Statistic [2]. According to estimates, there were 311,000 cervical cancer deaths and 570,000 cases globally in 2018 [3]. and in 2018, according to the latest data released by the World Health Organization (WHO), Iraq reported 155 deaths from cervical cancer, which accounted for 0.09 percent of all deaths, ranking Iraq 171st in the world [4]. Cervical cancer can be prevented by implementing thorough screening, which will enable early detection and appropriate treatment [5]. Cervical intraepithelial neoplasia (CIN) is generally considered an essential precursor lesion for the development of cervical cancer. A persistent cervical infection with the human papillomavirus (HPV) is necessary for the development of cervical intraepithelial neoplasia, which is a histological diagnosis [6]. Human papillomavirus is one of the most common sexually transmitted diseases and is mainly presented without symptoms [7]. Human

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papillomaviruses are regarded as the most common infectious agents and are transmitted sexually worldwide. The three main preventive strategies for cervical cancer are primary, secondary, and tertiary prevention. Primary prevention comprises sexual education, health information, and cautions regarding tobacco use, in addition to the HPV vaccine. Screening and appropriate treatment are components of secondary prevention. Tertiary prevention covers the treatment of invasive cancer at any age [8]. According to the American College of Obstetricians and Gynecologists, cervical screening for those younger than 21 years old is not recommended, and from 21 to 65, Pap test alone every 3 years is indicated. Those 65 and older have no need for screening if there is no history of cervical changes, but those with a history of cervical cancer, HIV, or a weak immune system need more frequent screening [9].

The chance of dying from cervical carcinoma is reduced by 75% with routine cervical screening but not completely eliminated.[6] According to current guidelines, liquid-based Pap tests and conventional glass slides (also known as the Pap smear) are equally suitable for screening [10]. A Pap smear, often known as a Pap test, is a technique used to check women for cervical cancer. A Pap smear involves collecting cells from the cervix. When cervical cancer is detected early, a Pap smear increases the chance of a cure. Changes in cervical cells that could indicate the development of cancer in the future can also be found with a Pap smear. Cervical cancer begins with the early detection of these aberrant cells using a Pap smear [11].

In Iraq, there was limited research on cancer incidents, in particular in the Kurdistan region. In recent years, there has been evidence of an elevated risk of all cancers, including cervical cancer, according to the first study on cancer incidence in the Kurdistan region [12]. Improving the overall cancer screening rates will largely depend on the information that is disseminated among medical professionals about all types of cancer, including cervical cancer, as there is currently little information available about the factors that influence their participation in screening programs.

Aim:

To evaluate medical workers' knowledge, attitude, and practice (KAP) of medical workers regarding Pap smear screening, and to identify factors influencing these components.

Objectives:

1. To assess the level of knowledge, attitude, and practice of medical workers toward Pap smear screening.
2. To explore associations between demographic characteristics and KAP outcomes.
3. To identify barriers to Pap smear uptake among medical workers.
4. To examine the relationship between knowledge and practice related to Pap smear screening.

Methods and Materials

Study Design: Cross-sectional study.

Research Setting: This study was carried out among medical staff in Shar Hospital, Teaching Hospital, Dr. Jamal Hospital, Smart Health Tower, Anwar Sheikh Medical Center, Harem, and Asia Hospitals in Sulaimani, Kurdistan region, Iraq, from November 1, 2023, to April 1, 2024.

Research participants and sample size: This study focused exclusively on female medical workers due to their accessibility, relatively higher health literacy, and their role in promoting preventive health measures within the community. Given the limited public awareness and lower educational levels in the general population, this group serves as a practical starting point for assessing cervical cancer screening behaviors. Future research is planned to expand these findings to the general population. 300 responses were collected, 251 through hard copies and 49 through an online form.

Inclusion criteria: female medical workers, residents of Sulaimani City, and older than 18 years old.

Exclusion criteria: below 18 years old, doctors, maternity hospital medical staff to avoid potential bias from those routinely exposed to Pap smear practices, outside Sulaimani, and those who refused to participate.

Data collection tool: a hard copy and Google Form of the self-administered questionnaire containing 26 questions in Kurdish. 6 questions regarding participants' background information (age, level of education, marital status, economic status, residency, smoking and alcohol consumption habits or nonsmoking), 9 questions to assess the level of knowledge, 5 questions about attitudes toward Pap smear and 6 questions related to the practice of the participants. Two experts, including a gynecologist and a specialist in family medicine, evaluated the questionnaire items for relevance, clarity, and comprehensiveness.

Pilot study:

A pilot study was conducted on 10% of the sample to assess reliability of the questionnaire which were not included in sample size. The estimated time required to answer the questionnaire was 3 minutes.

Data processing and analysis:

The data collection was done by Google Forms and hard copies. The questionnaire was developed by the researchers based on a review of relevant literature and included sections on knowledge, attitude, and practice regarding cervical cancer screening. The collected data were entered and underwent a cleaning process using Microsoft Excel 2016, then transferred into Statistical Package for Social Science (IBM SPSS software version 29.0) for statistical analysis. Knowledge scores were calculated and categorized into poor, fair, and good levels as defined in the variables section. Descriptive statistics (frequency and

percentage) were performed for qualitative variables. Chi-square tests were carried out to determine associations between qualitative variables, with a p-value of less than 0.05 considered statistically significant.

Software:

Microsoft Word, Microsoft Excel, EndNote, and IBM SPSS.

Variables:

One of the main outcomes of this research was the respondent's knowledge of cervical cancer and Pap smear. The respondent's knowledge was assessed by grouping the respondents into three groups based on their scores. There were 7 questions in the knowledge section from which the score was based; the possible minimum and maximum scores for knowledge were 0 and 7, respectively. "Correct" responses received a score of 1, while "incorrect" responses received a score of 0. Those who scored between 0 and 3 were categorized as having "poor" knowledge, those who scored between 4 and 5 as having "fair" knowledge, and those who scored between 6 and 7 as having "good" knowledge.

Results and Discussions

Table 1 Sociodemographic Data:

Table 1 shows that 62.3% of all participants had an age range between 18 and 29 years. 48.3% of respondents had a diploma degree. 49% of the respondents were married, and 49% were single. 90.3% had medium economic status (based on monthly household income), while 4.7% were in the low-income group, and the remaining participants were in the high-income group. Regarding residency, 87.3% of respondents were residents of the city. 98.3% of participants were neither smokers nor alcoholics.

Table 1: Sociodemographic characteristics of the participants.

Sociodemographic characteristics		**Frequency**	**Percentage**
Age(year)	18-29	187	62.3%
	30-40	79	26.3%
	≥ 41	34	11.3%
Education level	Bachelor's degree	130	43.3%
	Diploma	145	48.3%
	Secondary school	25	8.3%
Marital status	Single	147	49%
	Married	147	49%
	Divorced	3	1%
	Others	3	1%
Economic status	Low	14	4.7%
	Medium	271	90.3%
	High	15	5%
Residency	Urban	262	87.3%
	Sub rural	21	7%
	Rural	17	5.7%
Smoker/ Alcoholic	Cigarettes/Vape	3	1%
	Hookah	1	0.3%
	Alcohol	1	0.3%
	None of them	295	98.3%

Table 2 Knowledge assessment:

Only 53.3% knew about cervical cancer. 97% had no first-degree relatives with cervical cancer. Just 31.7% identified HPV as the cause. The majority (95.3%) answered that early diagnosis is important, 32.7% have heard about Pap smear, and 35.3% know the purpose of it. Only 44.3% knew the correct screening interval. In addition, 32.7% correctly answered that a Pap smear can find changes before it becomes cancer.

Table 2: Distribution of participants according to knowledge.

		Frequency	Percentage
Knowledge about CC?	Yes	160	53.3%
	No	140	46.7%
1st degree relative of CC*?	Yes	9	3%
	No	291	97%
CC* caused by HPV†?	Yes	95	31.7%
	No	205	68.3%
Is early diagnosis important?	Yes	286	95.3%
	No	14	4.7%
Any knowledge about Pap smear?	Yes	98	32.7%
	No	202	67.3%
Know purpose of Pap smear?	Yes	106	35.3%
	No	194	64.7%
Done every 1-3 years?	Yes	133	44.3%
	I don't have information	167	55.7%
Can find changes before becoming cancer?	Yes	98	32.7%
	I don't have information	202	67.3%

*Cervical cancer, †Human Papilloma Virus.

Table 3 Attitude Assessment:

The majority of participants agree that it is easy to talk about cervical cancer. Almost all of our participants state that it is important to do screening for cancer. 85.7% of participants regarded a Pap smear as a screening test for cervical cancer. While the majority of participants did not have information on whether a Pap smear is painful (74.3%) or expensive (82%).

Table 3: Distribution of participants according to their Attitude.

		Frequency	Percentage
Is it easy to talk about CC*?	Yes it's easy	212	70.7%
	No it's not easy	88	29.3%
Should people do screening for cancer?	Yes	297	99%
	No	3	1%
Is Pap smear screening for CC*?	Yes	257	85.7%
	No	24	8%
	I don't have information	19	6.3%
Is Pap smear painful?	Yes	36	12%
	No	41	13.7%
	I don't have information	223	74.3%
Is Pap smear expensive?	Yes	40	13.3%
	No	14	4.7%
	I don't have information	246	82%

*Cervical cancer.

Table 4 Practice towards Pap smear:

The vast majority of participants (97%) have never performed a Pap smear before. In addition, 98.7% of participants would rather have a Pap smear carried out by a gynecologist. 86% of them were ready to do a Pap smear if the doctor recommended it. 64.3% of participants disagreed with the notion that they are in good health and there is no need to do Pap smear. Majority of participants chose having inadequate knowledge as a reason for not performing Pap smear.

Table 4: Distribution of participants according to their practice.

		Frequency	Percentage
Done Pap smear before?	Yes	9	3%
	No	291	97%
Doing pap smear regularly?	Yes	3	1%
	No	6	2%
Who would you like to do it?	Gynecologist	296	98.7%
	Nurse	3	1%
	Midwife	1	0.3%
If doctor recommend will you do it?	Yes, I will	258	86%
	No, I won't	3	1%
	I'm not sure	39	13%
I'm in good health I don't need Pap smear	Strongly agree	6	2%
	Agree	16	5.3%
	Not sure	85	28.3%
	Disagree	193	64.3%
Reason for not performing Pap smear?	I don't have adequate knowledge	173	57.7%
	It's painful	10	3.3%
	Shame	36	12%
	Afraid of positive results	27	9%
	Husband's disapproval	2	0.7%
	Others	52	17.3%

Table 5 Association between sociodemographic data and degree of knowledge:

This table shows the association between the degree of knowledge of participants and their sociodemographic characteristics. There was a statistically significant correlation between knowledge level and education level ($p<0.05$). Those who had a bachelor's degree had better knowledge compared to those who had a diploma or secondary school degree.

Table 5: Association between sociodemographic data and degree of knowledge:

		Knowledge score groups N (%)				P-value
		Poor	Fair	Good	Total	
Age (year)	18-29	121	26	40	187	0.723
	30-40	45	16	18	79	
	≥ 41	21	6	7	34	
Education level	Bachelor's degree	71	20	39	130	0.023
	Diploma	99	22	24	145	
	Secondary school	17	6	2	25	
Marital status	Single	94	21	32	147	0.500
	Married	90	27	30	147	
	Divorced	1	0	2	3	
	Others	2	0	1	3	
Economic status	Low	8	4	2	14	0.219
	Medium	173	41	57	271	
	High	6	3	6	15	
Residency	Urban	164	41	57	262	0.990
	Sub rural	13	4	4	21	
	Rural	10	3	4	17	
Smoker/alcoholic	Cigarettes/vape	2	0	1	3	0.928
	Hookah	1	0	0	1	
	Alcohol	1	0	0	1	
	None of them	183	48	64	295	

Table 6 Association between the knowledge level of participants and their practice of Pap smear:

The most frequent reason for not completing a pap smear was a lack of information, which was found to be significantly correlated with knowledge level. among those with poor knowledge. The majority of participants who have not performed Pap smear are among those with poor knowledge scores, even though this was statistically insignificant ($p > 0.05$).

Table 6: Association between the knowledge level of participants and their practice of Pap smear.

		Knowledge score groups				P value
		Poor	Fair	Good	total	
Done pap smear before?	Yes	3	3	3	9	0.167
	No	184	45	62	291	
Doing it regularly?	Yes	0	2	1	3	0.112
	No	3	1	2	6	
Who would you like to do it?	gynecologist	184	48	64	296	0.245
	Nurse	3	0	0	3	
	Midwife	0	0	1	1	
If Doc recommend will you do it?	Yes I will	159	43	56	258	0.885
	No I won't	2	0	1	3	
	I'm not sure	26	5	8	39	
I'm in good health I don't need pap smear	Strongly agree	4	2	0	6	0.448
	Agree	11	2	3	16	
	Not sure	59	11	15	85	
	Disagree	113	33	47	193	
Reason of not performing pap smear?	I don't have knowledge	140	20	13	173	<0.001
	It's painful	5	1	4	10	
	shame	12	8	16	36	
	Afraid of positive results	9	8	10	27	
	Husband's disapproval	1	1	0	2	
	Others	20	10	22	52	

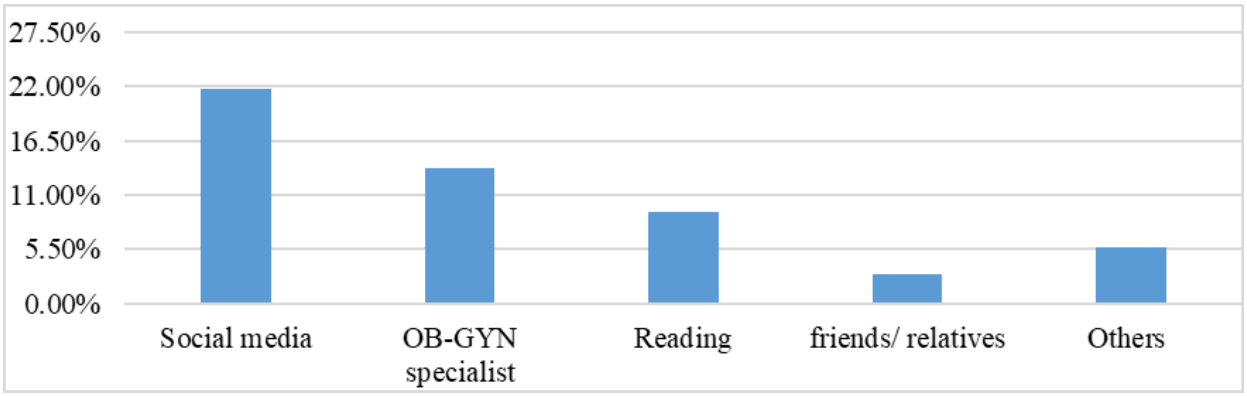

Figure 1: This figure shows the sources of information among the 53.3% of participants who had knowledge. The majority cited social media as their primary source of information on cervical cancer, while friends and relatives were the least common sources.

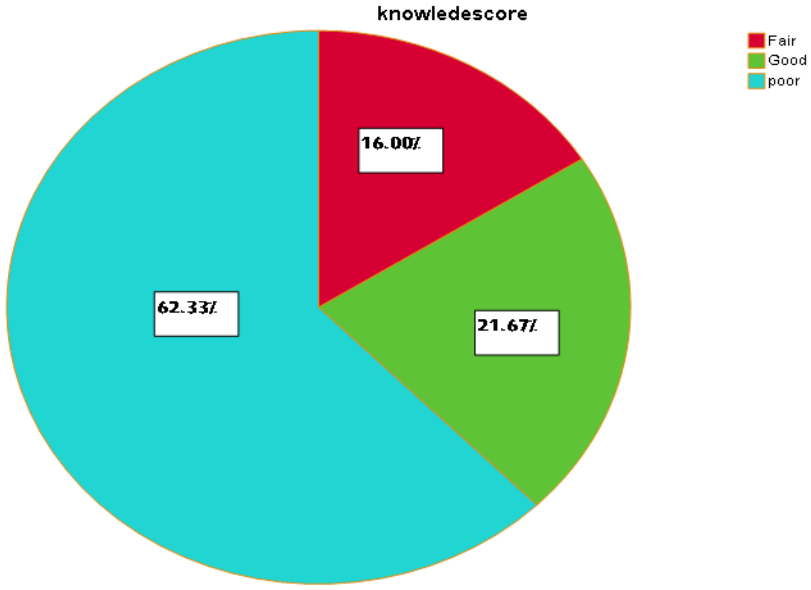

Figure 2: Shows knowledge score groups among 300 respondents: the majority of the participants had poor knowledge (62.3%), 21.7% were classified as having good knowledge, and 16% had fair knowledge.

Discussion

Although cervical cancer is preventable, no screening programs existed in the region during this study. This research in sulaimani assessed medical worker's knowledge, attitude, and practice toward Pap smear, highlighting current gaps and limitations.

Regarding the research population's demographic characteristic, 300 respondents with a mean age of 27.93 years participated.

Most of our respondents (91.6%) had an education level equal to or more than a diploma.

According to the respondent's knowledge score, only 21.67% of participants had good knowledge regarding cervical carcinoma and Pap smear. This result is lower if compared to a previous study carried out in southern Ethiopia, where 86.9% of participants had good knowledge [13]. This variation could be due to differences in availability of training opportunities for the caregivers in the study areas. Compared to a study done in Saudi Arabia, the finding is higher, where only 4% of individuals had good knowledge [14].

Regarding the cause of cervical cancer, 31.7% of the participants were aware the cause of cervical cancer is HPV. It is lower than a study carried out among female nurses in Abakaliki, where 86.4% correctly regarded HPV as a primary cause of cervical cancer [15].

Regarding Pap smear, 32.7% of our participants had knowledge about Pap smear. It is less than a study carried out in India, where 86.2% had adequate knowledge [16].

Regarding time intervals, 44.3% of the participants knew that a Pap smear should be carried out every 1-3 years. This finding is lower than a study carried out among women in Baghdad City, Iraq, where half of the participants (50.9%) correctly identified the time intervals for doing Pap smear [17].

32.7% of the participants knew that Pap smear could find changes before they became cancer. The result is lower than a study carried out in Ethiopia, wherein 73.2% of participants concurred that screening aids in cervical cancer prevention [18].

These discrepancies could be due to the lack of this test in Kurdistan health system national screening methods. The finding was not surprising because medical workers have insufficient information about the disease and the relevance of Pap smear in cervical cancer prevention.

The most commonly identified source of information among the participants was social media (21.7%). It is higher than a study carried out in Duhok City in 2019, where only 3.5% of them chose social media as their source of information [19]. The increased posting of awareness videos on social media in recent years may be the cause of this difference. Social media has been widely used for health-related purposes and could be regarded as a powerful tool.

Regarding attitude, around 85.7% of participants identified the Pap smear as a cervical cancer screening method, which is significantly higher than the results of a study in southern Saudi Arabia, where only about one-third (36.5%) of women were aware of the Pap smear's purpose. This study found that women's attitudes towards preventing cervical cancer, as well as their awareness of pap tests were strongly linked to their level of education and type of profession [14].

Depending on our result, 97% of participants have not performed Pap smear before. The reason behind it is due to poor knowledge about screening test. This finding is consistent with a study in

Northwest Ethiopia among female healthcare providers, where 2.0% were screened via a Pap smear [20].

98.7% of the participants preferred to have a Pap smear test done by a gynecologist, and in the study in Iran, most of the participants preferred a gynecologist to do the Pap smear test [21]. This result is due to the fact that women feel more comfortable with female doctors and are more knowledgeable than other health care providers.

86% of the participants were ready to do Pap smear if the doctor suggested it. The results suggest a gap between intention and practice; while 86% were willing to undergo a Pap smear if recommended, only 3% had actually undergone the procedure, indicating that many participants may be willing but face limited knowledge and other systemic barriers. On the other hand, 52.2% of the participants from a study in Iran showed that the reason behind not having a Pap smear test was due to no physician or other health provider's recommendation [22]. Approximately 7.3% answered that they are in good health and there is no need for them to do Pap smear, while in a study in Baghdad city among women, the result was 20.8% [17]. This is related to their thought regarding Pap smear, which is only carried out when there is an alarming sign despite a regular screening test.

57.7% of participants regarded inadequate knowledge as a reason for not performing Pap smear. This aligns with the research conducted in Iran, which identified a deficiency in knowledge as a factor contributing to non-participation [22].

A statistically significant relation was found between education level and level of knowledge concerning cervical cancer screening (p-value=0.023), which means that those with a higher level of education have a higher knowledge score. Association between knowledge score and practice: Although the majority of participants with poor knowledge had not undergone a Pap smear, this association was not statistically significant (p-value more than 0.05), suggesting that other factors may also influence practice. Knowledge does not always translate into practice. For instance, in the Yemen study, just 7% of the people who were knowledgeable about cervical cancer had undergone cervical cytology testing (Pap smear test) [23] general weaknesses in the Kurdistan health system, like the absence of a national screening program; a significant portion of the necessary education and notification regarding Pap smear is not provided in the local language (Kurdish), making it difficult for some women to understand; insufficient training and awareness among healthcare providers and challenges in accessing screening services, potentially due to the lack of organized healthcare services. These factors may address the result of the research.

Points of Strength

- 83.7% of our data was collected face-to-face, which makes it less likely to have bias.
- Included multiple public and private hospitals.

Points of weakness

- Focused only on health professionals; mainly descriptive.
- Non-randomized convenience was used in this study.
- Time limitation.
- Terminology bias, recall biases, and social desirability bias may also be included.

Conclusion

Our analysis showed a significant association between participants' knowledge levels and their Pap smear practice. The most frequent reason for not undergoing screening was lack of information about the procedure. This suggests that poor knowledge is the primary barrier to practice rather than unwillingness. Consistent with this, most participants (86%) indicated they would undergo a Pap smear if recommended by a doctor, implying that increased awareness and education could significantly improve screening uptake.

Recommendation

- Raise public awareness on Pap smear screening by fostering collaboration between health centers, educational institutions, and the mass media to spread information effectively.
- Implement early screening programs at the primary care level, targeting high-risk groups, and encouraging participation through healthcare professionals.
- Conduct further large-scale studies using randomized sampling to evaluate cervical cancer and Pap smear practices.

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Author's contribution

Dr. Maryam Bakir developed the study topic and prepared the outlines, Solin Yousif contributed to the methods and performed data analysis, Iman Nawzad wrote the discussion section, and Sozy Othman drafted the manuscript. All authors participated in data collection, contributed to the interpretation of the results, revised the manuscript, and approved the final version.

Conflict of interest

The authors declare no conflicts of interest.

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