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The Relationship Between Nursing Students' Attitudes Toward E-Learning and Phubbing Behavior: A Descriptive and Correlational Study

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Abstract

Background: E-learning plays a critical role in modern nursing education by offering flexibility and access to diverse learning resources. However, excessive smartphone use and behaviors like phubbing—ignoring others to focus on one's phone—may negatively impact learning engagement and communication.

Aim: This study aimed to examine the relationship between nursing students' attitudes toward e-learning and their phubbing behavior, as well as the influence of demographic and behavioral factors.

Methods: A cross-sectional, descriptive, and correlational design was adopted. The sample consisted of 283 undergraduate nursing students from a public university in Türkiye. Data were collected using the *Attitudes Toward E-Learning Scale* (ATELS) and the *Generic Scale of Phubbing* (GSP). Descriptive statistics, independent t-tests, one-way Analysis of Variance (ANOVA) with post hoc tests, and Pearson correlation analyses were conducted to evaluate the data.

Results: Results showed that students held moderately positive attitudes toward e-learning (mean ATELS: 28.18±7.78) and moderate levels of phubbing (mean GSP: 48.71±15.69). No significant correlation was found between ATELS and GSP scores. Gender and school grade were significantly associated with ATELS scores, with male and second-year students reporting more positive attitudes. Stronger communication skills were also linked to higher ATELS scores ($p<0.05$). In contrast, higher daily smartphone use, lower communication skills, and low participation in social activities were significantly associated with increased phubbing.

Conclusion: These results suggest that although both behaviors are shaped by digital habits, they are not directly related. Improving students' communication skills and encouraging digital self-regulation may enhance the effectiveness of e-learning. Further research should explore these dynamics across different educational settings.

Keywords: Communication skills, e-learning, nursing students, phubbing, smartphone use

Introduction

Technological advancements have significantly transformed nursing education, particularly with the widespread adoption of e-learning, defined as the delivery of instruction through digital platforms.[1] It provides flexibility, accessibility, and learner autonomy.[1,2] The increased use of mobile technologies has also expanded opportunities for mobile learning, which allows students to personalize and extend their educational experiences beyond the classroom.[3]

However, the ubiquity of smartphones has introduced challenges to academic and social settings. One such challenge is phubbing, a behavioral pattern in which individuals ignore those physically present in order to engage with their smartphones.[4,5] Research indicates that phubbing may impair face-to-face communication, increase social anxiety, and contribute to problematic smartphone use, particularly among university students.[6–8]

E-learning and phubbing represent two keys, yet contrasting, dimensions of students' digital engagement. While e-learning emphasizes structured, purposeful, and academically oriented use of technology,[1,2] phubbing reflects a disruptive and socially detrimental pattern of smartphone use.[4,5] Previous studies on phubbing have primarily focused on its associations with technological addictions, fear of missing out, personality traits, loneliness, and relationship satisfaction among university students.[9–13] Similarly, research on e-learning has highlighted its flexibility and accessibility, while also noting challenges such as digital fatigue and unequal digital literacy among nursing students.[14–17] Yet, no empirical study has directly examined how these two digital-age phenomena interact. This constitutes a critical gap in the literature, given the increasing centrality of digital learning in nursing education.

From a theoretical perspective, sustained attention and cognitive engagement are essential for effective participation in e-learning environments. According to Attentional Control Theory, distractions compete for limited attentional resources, impairing task performance and cognitive engagement.[18] In this context, phubbing can be conceptualized as a modern digital distraction that reduces learners' attentional control. Empirical evidence supports this linkage; for instance, phubbing contributes to attentional conflict, wherein the smartphone competes with interpersonal interaction for cognitive resources.[19] Similarly, Cognitive Load Theory suggests that off-task smartphone use increases extraneous cognitive load, which may hinder students' ability to process

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educational content.[20,21] Moreover, Self-Regulated Learning Theory emphasizes that learners must control attention, motivation, and behavior to achieve effective learning outcomes.[22] Thus, it is plausible to assume that frequent phubbing behaviors, by reducing attentional control and increasing cognitive load, may limit students' ability to benefit fully from e-learning environments.

Building on these theoretical frameworks and addressing the identified gap, to our knowledge, this is the first study to specifically examine the relationship between nursing students' attitudes toward e-learning and their phubbing behavior. Therefore, this study aims to examine the relationship between nursing students' attitudes toward e-learning and their phubbing behavior, and to explore how demographic and behavioral factors influence these variables.

Study Questions

1. Is there a significant relationship between nursing students' attitudes toward e-learning and their phubbing behavior?
2. Do demographic characteristics lead to significant differences in e-learning attitudes and phubbing levels?
3. Do behavioral factors lead to significant differences in e-learning attitudes and phubbing levels?

Materials and Methods

Study Design

This cross-sectional, descriptive, and correlational study was conducted to examine the relationship between nursing students' attitudes toward e-learning and their phubbing behavior.

Sample and Setting

The population consisted of 518 undergraduate nursing students enrolled in a health sciences faculty in Türkiye. Using the known population formula with a 95% confidence level and a 5% margin of error, the minimum required sample size was calculated as 221. A convenience sampling method was employed to recruit participants. Ultimately, data were collected from 283 students who met the inclusion criteria and voluntarily agreed to participate. This larger sample size was intended to enhance the statistical power and reliability of the findings. Participants were included if they were 18 years or older, enrolled in the nursing program during the data collection period, voluntarily agreed to participate, and completed all study instruments in full. Students who did not meet these criteria—such as those under 18 years of age, not actively enrolled, lacking informed consent, or submitting incomplete data—were excluded.

Data Collection Instruments

Three instruments were used to collect data: a Sociodemographic Information Form, the Attitude Toward E-Learning Scale (ATELS), and the Generic Scale of Phubbing (GSP).

Sociodemographic Information Form

This 9-item form, developed by the researchers based on the literature,[23,24] included questions related to age, gender, academic status, phone use duration, and communication skills.

Attitude Toward E-Learning Scale (ATELS)

The ATELS was developed by Zabadi and Al-Alawi[25] in 2016 to assess university students' attitudes toward e-learning. It consists of 11 items on a one-dimensional, 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Guillasper et al.[16] in 2020 validated a 9-item version for nursing students, reporting it as valid and reliable. Item 9 is reverse scored, and the total score ranges from 9 to 45, with higher scores indicating more positive attitudes. In this study, the Turkish 9-item version validated by Aydın et al.[17] in 2022 was used. The Cronbach's alpha was 0.913 in their study and 0.884 in the present sample.

Generic Scale of Phubbing (GSP)

The GSP was developed by Chotpitayasunondh and Douglas[26] in 2018 to assess individuals' phubbing behaviors. The scale includes 15 items rated on a 7-point Likert scale (1=Never, 7=Always). Higher scores indicate a greater tendency toward problematic phubbing behaviors. The scale comprises four subscales: nomophobia, interpersonal conflict, self-isolation, and problem awareness. The Turkish version was validated by Orhan Göksün[27] in 2019, with a reported Cronbach's alpha of 0.86. In the present study, Cronbach's alpha was 0.89.

Data Collection

Data were collected face-to-face between March and May 2024 using printed, self-administered questionnaires. The questionnaires were distributed during scheduled class hours in a quiet undergraduate classroom at the Faculty of Health Sciences, at times approved by the instructors, typically at the start or end of the lesson, before students dispersed. Informed consent was obtained from all participants prior to data collection. On average, each participant completed the questionnaires in approximately 5–6 minutes.

Ethical Considerations

Ethical approval was obtained from the Van Yüzüncü Yıl University Non-interventional Clinical Research Ethics Committee (Approval Number: 2024/03-10, Date: 08.03.2024). Approval for data collection was obtained from the institution, and permission to use the relevant measurement scales was secured from the original authors via email communication. Written informed consent was obtained from all student participants after they were provided with detailed information about the purpose and voluntary nature of the study. The principles of the Declaration of Helsinki were taken into account in the conduct of the study.

Data Analysis

Quantitative data were analyzed using the Statistical Package for the Social Sciences version 25.0 (SPSS 25.0; IBM, New York, USA). Descriptive statistics, including arithmetic mean, standard deviation, percentages, and minimum–maximum values, were calculated. The normality of the data distribution was assessed by examining skewness and kurtosis values. For normally distributed data, independent samples t-tests and one-way Analysis of Variance (ANOVA) were used. In cases where ANOVA results were significant across three or more groups, post hoc tests such as Tukey, Tamhane, and Least Significant Difference (LSD) were applied to determine the source of differences. Pearson correlation analysis was conducted to examine the relationships between scale scores. All analyses were performed with a 95% confidence interval and a significance level of 0.05.

Results

Descriptive Statistics of ATELS, GSP, and GSP Subscales

An analysis of the scores obtained by the students from the ATELS, the GSP, and the GSP subscales revealed that the mean total score for the ATELS was 28.18±7.78, while the mean total score for the GSP was 48.71±15.69. Among the GSP subscales, the mean score for Nomophobia was 17.07±5.46, for Interpersonal Conflict 9.91±5.17, for Self-Isolation 11.37±5.60, and for Problem Awareness 10.38±4.07. The Cronbach's alpha coefficients for all scales ranged between 0.740 and 0.898, indicating a good level of internal consistency (Table 1).

Comparison of ATELS, GSP, and GSP Subscale Scores by Sociodemographic Characteristics

Table 2 summarizes the participants' sociodemographic characteristics (gender, academic year, communication skills, and participation in social activities) and

Table 1. Distribution of mean scores and score ranges for the attitudes toward e-learning scale (ATELS), the generic scale of phubbing (GSP), and GSP subscales (n=283)

Scales	Min-max	Mean±SD	Cronbach's α
ATELS total score	9–45	28.18±7.78	0.896
GSP total score	21–97	48.71±15.69	0.898
Nomophobia	5–28	17.07±5.46	0.819
Interpersonal conflict	4–28	9.91±5.17	0.868
Self-isolation	4–28	11.37±5.60	0.887
Problem awareness	3–21	10.38±4.07	0.740

SD: Standard deviation, Min: Minimum, Max: Maximum.

Table 2. Comparison of total mean scores of the attitudes toward e-learning scale (ATELS), the generic scale of phubbing (GSP), and GSP subscales by sociodemographic characteristics (n=283)

	n	%	ATELS	GSP (total)	Nomophobia	Interpersonal conflict	Self-isolation	Problem awareness
Gender								
Female	196	69.3	27.10±7.38	48.55±16.35	17.21±5.51	9.69±5.18	11.26±5.86	10.38±4.26
Male	87	30.7	30.61±8.17	49.10±14.11	16.76±5.36	10.42±5.17	11.60±4.98	10.37±3.63
			t=-3.567	t=-0.265	t=0.647	t= 1.082	t=-0.475	t=0.021
			p=0.000	p=0.791	p=0.518	p=0.280	p=0.635	p=0.983
School grade								
1st year[a]	100	35.3	27.15±7.26	48.05±16.19	16.95±5.61	9.80±5.36	11.05±6.00	10.32±3.83
2nd year[b]	79	27.9	30.20±7.25	48.84±16.02	16.82±5.04	10.38±5.30	11.67±5.31	9.96±4.07
3rd year[c]	36	12.8	29.00±8.18	47.69±12.93	17.67±5.16	9.11±4.22	10.50±5.16	10.42±3.94
4th year[d]	68	24.0	26.91±8.52	50.06±16.13	17.24±5.94	9.97±5.27	11.93±5.57	10.93±4.49
			F=3.164	F=0.274	F=0.232	F=0.518	F=0.694	F=0.691
			p=0.025	p=0.844	p=0.874	p=0.670	p=0.556	p=0.558
			b>a					
			b>d					
Self-assessed communication skills								
Poor[a]	12	4.2	25.25±7.60	63.25±19.74	17.75±5.80	15.50±7.24	15.92±6.68	14.08±3.77
Moderate[b]	135	47.7	27.14±7.20	48.61±14.28	16.96±5.28	9.87±4.72	11.27±4.99	10.51±3.95
Good[c]	136	48.1	29.47±8.18	47.51±16.13	17.13±5.64	9.47±5.16	11.05±5.94	9.92±4.06
			F=4.001	**F=5.729**	F=0.130	**F=7.854**	**F=4.286**	**F=6.113**
			p=0.019	**p=0.004**	p=0.878	**p=0.000**	**p=0.015**	**p=0.003**
			c>b	**a>b**		**a>c**	**a>b**	**a>b**
				a>c			**a>c**	**a>c**
Difficulty communicating with friends								
Yes[a]	15	5.3	30.47±7.42	56.73±20.81	16.47±5.29	14.20±7.30	13.87±6.65	12.20±4.49
Sometimes[b]	147	51.9	27.45±7.41	49.78±14.48	17.03±5.26	10.18±4.79	11.78±5.10	10.71±3.84
No[c]	121	42.8	28.79±8.22	46.43±16.05	17.20±5.75	9.07±5.07	10.55±5.94	9.75±4.20
			F=1.667	**F=3.636**	**F=0.127**	**F=7.256**	**F=3.209**	**F=3.483**
			p=0.191	**p=0.028**	**p=0.881**	**p=0.001**	**p=0.042**	**p=0.032**
				a>c	**a>b**		**a>c**	**a>c**
					a>c			
Difficulty communicating with patients during nursing care								
Yes[a]	15	5.3	27.73±7.32	64.53±17.27	18.73±5.04	15.53±6.78	15.27±5.68	15.00±4.10
Sometimes[b]	145	51.2	28.79±7.19	49.63±13.48	16.82±5.01	10.53±4.61	11.74±4.84	10.56±3.64
No[c]	123	43.5	27.51±8.45	45.72±16.67	17.17±5.99	8.50±5.01	10.45±6.18	9.60±4.17
			F=0.925	**F=10.808**	F=0.866	**F=15.955**	**F=5.807**	**F=13.079**
			p=0.398	**p=0.000**	p=0.422	**p=0.000**	**p=0.003**	**p=0.000**
				a>b		**a>b**	**a>b**	**a>b**
				a>c		**a>c**	**a>c**	**a>c**
						b>c		
Frequency of participation in social activities								
Never[a]	30	10.6	28.10±8.33	55.31±20.31	18.23±6.27	12.27±7.08	13.83±6.92	10.69±4.92
Once a month[b]	67	23.7	27.48±8.29	47.12±15.30	17.18±5.70	9.09±4.69	10.99±5.92	9.87±4.08
Once a week[c]	102	36.0	28.04±7.41	47.96±14.61	17.22±5.36	9.44±4.83	10.65±4.94	10.59±4.17
Several times a week[d]	84	29.7	28.94±7.69	48.61±15.16	16.40±5.08	10.31±4.95	11.66±5.39	10.43±3.63
			F=0.458	F=2.040	F=0.900	**F=3.150**	**F=2.729**	F=0.502
			p=0.712	p=0.109	p=0.442	**p=0.025**	**p=0.044**	p=0.681
						a>b	**a>b**	
						a>c	**a>c**	

p<0.05 indicates statistical significance. F: One-way Analysis of Variance (ANOVA), t: Independent samples t-test, n (%) are presented for descriptive purposes. Different superscript letters (a, b, c, d) indicate statistically significant differences between groups based on post-hoc test results (p < 0.05).

presents group comparisons, including the analysis of ATELS, GSP, and GSP subscale score averages according to their demographic and interpersonal characteristics. Male students reported significantly higher ATELS scores than females (p<0.005), while no significant gender differences were found in GSP or its subscales. According to the academic year, second-year students scored higher on ATELS compared to first- and fourth-year students (p<0.05).

Table 3. Correlations between the attitudes toward e-learning scale (ATELS), the generic scale of phubbing (GSP), and GSP subscale scores (n=283)

	Min–max	Mean±SD		ATELS	GSP (total)	Nomophobia	Interpersonal conflict	Self-isolation	Problem awareness
Age	18–35	21.39±1.88	r	**0.130***	-0.053	-0.058	-0.026	-0.036	-0.039
			p	**0.029**	0.378	0.329	0.668	0.552	0.511
Daily smartphone use (hours)	1–24	4.89±3.23	r	0.030	**0.267****	**0.129***	**0.260****	**0.219****	**0.168****
			p	0.613	**0.000**	**0.030**	**0.000**	**0.000**	**0.005**
Time spent without smartphone use (hours)	0–24	7.66±6.58	r	**0.149***	**-0.180****	**-0.133***	**-0.161****	**-0.131***	-0.099
			p	**0.012**	**0.003**	**0.026**	**0.007**	**0.028**	0.097
ATELS			r	1	-0.012	-0.096	0.030	0.023	0.008
			p	–	0.840	0.108	0.613	0.702	0.888

*: Correlation is significant at the 0.05 level (two-tailed), **: Correlation is significant at the 0.01 level (two-tailed). Min-Max and Mean±standard deviation (SD) are provided for descriptive purposes. Min: Minimum, Max: Maximum, SD: Standard deviation, r: Pearson correlation coefficient.

Communication skills were also associated with outcomes. Students who rated their skills as good scored higher on ATELS than those with moderate skills, while those with poor skills had significantly higher GSP, Self-Isolation, Problem Awareness, and Interpersonal Conflict scores ($p<0.05$). Similarly, students reporting difficulty communicating with friends or with patients during nursing care had significantly higher GSP total and subscale scores, except for the Nomophobia subscale ($p<0.05$).

Participation in social activities was linked to lower interpersonal conflict and self-isolation. Students who never engaged in social activities scored significantly higher on these subscales compared with those participating monthly or weekly ($p<0.05$).

Correlation Between ATELS, GSP, and GSP Subscale Scores

The descriptive characteristics of continuous variables (age, daily smartphone use, and time spent without smartphone use) are presented together with the correlation analysis in Table 3. A statistically significant but weak positive correlation was found between age and ATELS scores ($r=0.130$, $p=0.029$). Daily smartphone use showed a moderate positive correlation with GSP total scores ($r=0.267$, $p<0.01$) and with all GSP subscales. Time spent without smartphone use had significant negative correlations with the GSP total and its subscales, except for the Problem Awareness subscale. No significant correlation was found between ATELS and GSP scores.

Discussion

This study investigated the relationship between nursing students' attitudes toward e-learning and their phubbing behavior, as well as the influence of demographic and behavioral factors. Students reported moderately positive attitudes toward e-learning and moderate levels of phubbing, consistent with previous studies indicating that digital tools represent both opportunities and challenges in higher education.[4,14,17,23,28,29]

Importantly, no significant correlation was found between attitudes toward e-learning and phubbing. This indicates that, although both variables may be influenced by similar behavioral dynamics, they may be governed by distinct psychosocial, individual, and environmental processes. While e-learning environments are largely shaped by factors such as pedagogical design, student motivation, and technological infrastructure,[20,22] phubbing behavior is more closely related to digital addiction tendencies and social interaction patterns.[23,30] This discrepancy is consistent with research showing that smartphone overuse is associated with distraction, social withdrawal, and reduced attention control.[18,31–33]

According to the correlation findings, a statistically significant but weak positive relationship was found between age and attitudes toward e-learning ($r=0.130$). However, the strength of this association is limited, and its practical significance should be interpreted with caution.[34] While statistical significance indicates the existence of a relationship, the weak effect size suggests that age alone does not meaningfully influence students' attitudes toward e-learning. This finding supports the view that weak correlations have minimal practical utility in educational research and should not be overemphasized. A significant positive correlation was observed between time spent on mobile phones and phubbing levels, indicating that greater daily smartphone use is associated with higher phubbing scores. This finding aligns with previous studies linking phubbing behavior to social isolation and problematic digital engagement.[23,30] Conversely, time spent away from phones showed negative correlations with phubbing scores, suggesting that longer periods without phone use are related to reduced phubbing tendencies. Additionally, a weak positive correlation between e-learning attitudes and time spent without phone use was identified; however, given the small effect size, this result should be interpreted cautiously and may only reflect a limited influence of screen time on students' focus and adaptability in digital learning.

In this study, associations were observed between students' communication skills and both ATELS and GSP scores. Students with stronger communication skills demonstrated more positive attitudes toward e-learning and lower phubbing levels. These results align with previous research showing that excessive use of digital platforms may reduce face-to-face interaction and contribute to social withdrawal.[31,35] Specifically, Ayar and Gürkan[35] in 2022 found a weak negative correlation between phubbing and communication skills among nursing students, while Han et al.[31] in 2022 reported a similar association with interpersonal relationships. Phubbing, characterized by prioritizing digital engagement over in-person interaction, may interfere with communication competencies. This is reflected in students reporting communication difficulties or lower social participation, who exhibited higher phubbing scores. Overall, these findings highlight a relationship between communication skills and phubbing, suggesting that enhancing communication competencies may support social and professional development in nursing education.

Regarding gender, male students demonstrated more positive attitudes toward e-learning than females, which is consistent with some studies in the literature.[14,36] For instance, Diab and Elgahsh[14] in 2020 found that male nursing students had more favorable attitudes toward e-learning than their female counterparts. However, contrary to these findings, Köse et al.[15] in 2022 reported that female nursing students had higher e-learning attitude scores during the Coronavirus Disease 2019 (COVID-19) pandemic. These conflicting findings may reflect deep-rooted societal gender norms and a persistent digital gender divide in Türkiye. Research has shown that women's access to and use of the internet remains significantly lower compared to men, suggesting continued disparities in digital access and confidence.[37] Furthermore, a study on digital literacy in Türkiye revealed that males scored higher in technical and functional skills, whereas females outperformed in daily-use and ethical responsibility dimensions—highlighting gendered differences in how technology is navigated and valued.[38]

Similarly, variations in academic year may influence attitudes toward e-learning. While some studies suggest that students adapt better to e-learning as their education level increases,[39] others report a decline in digital interest over time and a shift toward different learning modes in clinically focused academic years.[40,41] This study found significant differences in e-learning attitudes by year of study, with second-year students scoring higher than first- and fourth-year students. In Türkiye, nursing education typically allocates at least one-third of the total educational period to theoretical instruction, with the remainder devoted to clinical practice.[42] This structure may help explain the results of this study: second-

year students–immersed in heavy theoretical coursework with emerging clinical exposure–may find e-learning particularly beneficial for assimilating theoretical knowledge. In contrast, fourth-year students, deeply immersed in clinical practice, may prioritize hands-on experiences over digital learning and experience digital fatigue, with cultural expectations around clinical competency further pushing them toward in-person training.

Taken together, these findings indicate that e-learning attitudes and phubbing behaviors, although both shaped by digital habits, require distinct but complementary strategies in nursing education. Rather than assuming that reducing phubbing will directly enhance e-learning engagement, programs could benefit from integrated approaches that strengthen communication skills, promote digital self-regulation, and foster social participation. Embedding structured communication training within the nursing curriculum, organizing workshops on healthy smartphone use, and creating opportunities for students to engage in collaborative activities may indirectly mitigate phubbing behaviors while simultaneously improving the quality of e-learning experiences.[32,43,44] Such initiatives not only support academic success but also contribute to the development of professional competencies essential for effective nursing practice.

Limitations

This study has certain limitations that should be considered when interpreting the findings. First, the data were collected through self-reported measures, which may be subject to response bias and social desirability effects. In particular, communication skills were assessed using self-report items, which may lead to subjective evaluation errors and inconsistencies between perceived and actual performance. Second, the study was conducted in a single health science faculty in Türkiye, which may limit the generalizability of the results to all nursing students. Moreover, the sample was selected through convenience sampling, further restricting the generalizability of the findings. Future studies involving more diverse samples from different institutions and using mixed or objective methods are recommended to enhance the robustness and transferability of the findings.

Conclusion

Although e-learning attitudes and phubbing behavior are both influenced by digital habits, this study found no direct association between them among nursing students. Positive attitudes toward e-learning were significantly associated with being male, being in the second year of study, and having stronger communication skills. In contrast, higher levels of phubbing were associated with poorer communication skills, greater daily smartphone use, and lower social participation.

Findings from this study highlight the importance of addressing phubbing as a separate behavioral concern that may indirectly affect the quality of digital learning and professional communication. Interventions aimed at enhancing students' interpersonal skills and digital self-regulation may contribute to more effective and mindful use of technology in academic and clinical contexts.

As e-learning continues to expand in nursing education, future research should continue to explore longitudinal trends and examine the effectiveness of targeted behavioral interventions designed to reduce phubbing and promote healthy digital engagement.

Ethics Committee Approval: The study was approved by the Van Yüzüncü Yıl University Non-interventional Clinical Research Ethics Committee (Approval Number: 2024/03-10, Date: 08.03.2024).

Informed Consent: Written informed consent was obtained from all students who participated in the study.

Conflict of Interest: The authors have no conflicts of interest to declare..

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