


Socio-ecological Factors Influencing Cybervictimization among Iranian Adolescents

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Abstract

Background: Cybervictimization among adolescents is a growing concern, particularly in non-Western contexts where empirical evidence remains limited. Guided by socioecological theory, this study aimed to examine how individual (i.e., gender, negative mood, loneliness), family (i.e., parental supervision, home belonging, parental education), peer (i.e., peer acceptance, peer rejection), and school-related factors (i.e., school victimization, school climate, educational level) are associated with cybervictimization among Iranian adolescents.

Methods: A cross-sectional survey was carried out among 592 students aged 13–18 from 36 classrooms across public and private secondary and high schools in Tabriz, Iran. Participants completed an online self-report questionnaire assessing cybervictimization and associated predictors. Binary logistic regression analyses were performed to examine both bivariate and multiple associations.

Results: Nearly half of the students reported experiencing cybervictimization (46.8%). High school students ($P = 0.002$), those exposed to school victimization ($P < 0.001$), and those reporting negative mood symptoms ($P < 0.001$) were significantly more likely to be targeted. In contrast, students with a stronger sense of home belonging ($P = 0.016$) and greater parental supervision ($P = 0.036$) were significantly less likely to experience cybervictimization.

Conclusion: These results highlight the importance of addressing both school and home environments, as well as emotional well-being, in cybervictimization prevention efforts. Culturally responsive strategies involving schools, families, and mental health systems are recommended.

Keywords: Cybervictimization, Adolescents, Risk Factors, Protective Factors, Socioecological Framework, Logistic Regression

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Introduction

The rapid expansion of digital technologies has reshaped how adolescents interact, learn, and socialize, bringing both benefits and risks. One significant risk is cybervictimization, defined as experiencing intentional, aggressive behaviors through digital platforms (1). Unlike traditional bullying, online harassment occurs 24/7, often reaching victims in their own homes, making escape difficult (2). The anonymity and vast reach of the internet have further exacerbated its prevalence, making cybervictimization a growing public health and psychological concern

(2).

Cybervictimization is a widespread issue among adolescents, with global prevalence rates ranging from 13.99% to 57.5% (3). In Iran, although research is limited, studies highlight its growing concern. A cross-cultural study found Iran had the highest cybervictimization rate (11.4%) among 13 European and Asian countries (4), and another study reported that 14.6% of Iranian adolescents experienced cybervictimization in the past two months (5).

The rising prevalence of cybervictimization is concern-

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↑What is “already known” in this topic:

Cybervictimization among adolescents is influenced by various emotional, familial, and school-related factors, with most evidence derived from Western contexts.

→What this article adds:

This study provides culturally specific evidence from Iran, highlighting how emotional well-being, school victimization, and home environments relate to cybervictimization in a non-Western adolescent population.

ing due to its negative impact on adolescents' mental health, social functioning, and academic performance. Studies show that individuals who are victimized tend to report higher levels of depression, anxiety, suicidal ideation, and substance use (6-8). It also harms self-esteem, potentially leading to a negative self-image that persists into adulthood (9).

The significant consequences of cybervictimization underscore the need to identify the key predictors that contribute to this phenomenon. Existing literature has identified a wide range of individual, familial, peer, and school-related factors that contribute to the risk of cybervictimization. Research suggests that females are more likely to experience victimization in cyberspace than males (10). While negative mood states and social isolation increase vulnerability to online harassment (11-13), supportive family (14) can reduce risk. A review by Elsaesser et al. showed that inadequate parental supervision may increase adolescents' vulnerability to online victimization (15). Research indicates that adolescents who perceive a more positive school climate report lower levels of cybervictimization both within and across time (16). Additionally, a supportive and secure school environment has been shown to reduce the prevalence of cybervictimization (17).

Various psychological, communication, and sociological theories help explain online aggression [for a review, see (18)]. These theories focus on individual behavior, environmental influences, learning processes, and personality traits (19). Among these theories, a widely used framework for understanding bullying in adolescents is Bronfenbrenner's socioecological theory, which emphasizes the interaction between individual and environmental factors (19). This theory views cybervictimization as a multifaceted phenomenon influenced by various ecological layers, rather than solely the child's characteristics. Thus, addressing cybervictimization requires a compre-

hensive approach that considers both personal and environmental influences.

Despite the growing body of research on cybervictimization, relatively few studies take a multidimensional approach considering various influencing factors. Furthermore, the majority of existing research has been conducted in Western contexts. Given that cybervictimization is context-dependent, it is crucial to understand how cultural, familial, and school-related factors contribute to its occurrence among Iranian adolescents, who experience unique social pressures.

This study examines how individual, family, peer, and school-related factors are associated with cybervictimization among Iranian adolescents. Taking a socioecological approach provides a deeper understanding of the unique nature of cybervictimization in Iran and offers insights for developing targeted prevention and intervention strategies. Figure 1 illustrates the theoretical framework guiding this research.

Methods

This cross-sectional study included 592 students. Using convenience sampling at the school level, we approached 25 public and private secondary and high schools. Of these, 36 classrooms from 7 schools consented to participate. Eligible participants were students aged 13 to 18 years, enrolled in grades 7 to 12.

Data were collected online using a self-report questionnaire. After obtaining school administrators' approval, a questionnaire link was shared with students via school staff. Participants received study details, instructions, and assurances of anonymity and voluntary participation. Completing the survey took about 30 minutes. To encourage participation, students received a 30% book discount voucher, and assisting school staff received cash gift cards. Ethical approval for the study was granted by the

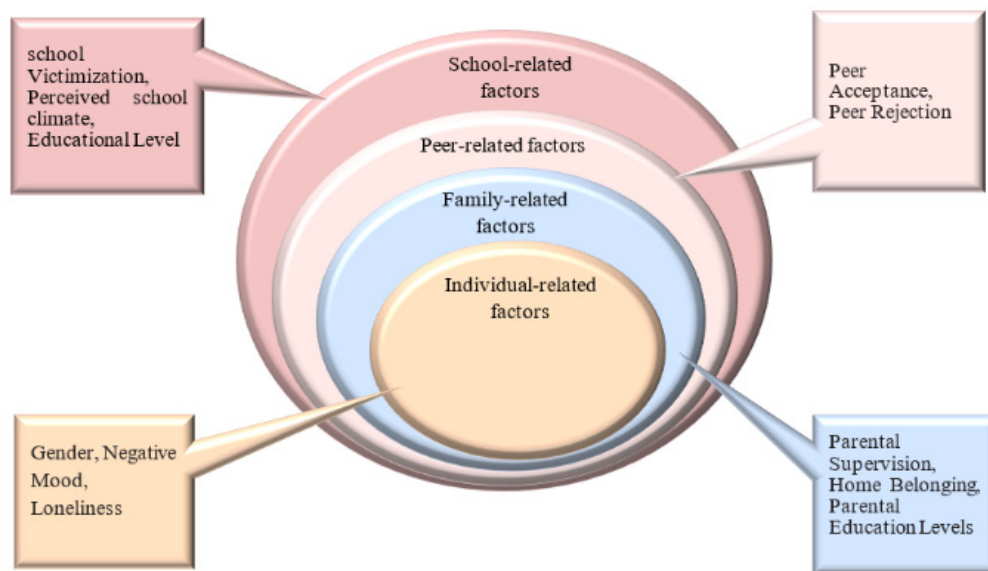


Figure 1. The socioecological framework of cybervictimization influences across individual, family, peer, and school levels

Ethics Committee of the University of Social Welfare and Rehabilitation Sciences in Iran (IR.USWR.REC.1398.063), and informed consent from parents as well as assent from the children were obtained.

Measures

The study utilized the Cyberbullying Victimization and Adolescent Psychosocial Context Battery (CVAPCB), a 37-item tool comprising seven scales that assess cybervictimization, negative mood, loneliness, mother-child relationships, father-child relationships, parental supervision, and perceived school climate. The validation process confirmed strong psychometric properties, with all items scoring above 1.5 in impact and an S-CVI exceeding 0.9. Factor analysis was supported by the Kaiser-Meyer-Olkin measure and Bartlett's test, ensuring sampling adequacy.

Outcome Variable

Cybervictimization was measured using an eight-item scale from the CVAPCB battery. Direct victimization included name-calling, humiliation, violent or offensive messages, and embarrassment by classmates. Indirect victimization involved secret-sharing, exclusion from online groups, and being ignored. A Likert scale of five points was used, with scores from 1 (It hasn't happened) to 5 (Almost daily).

For analysis purposes, the cybervictimization variable was dichotomized into a binary outcome: non-victimized (coded as 0) and victimized (coded as 1). A respondent was classified as "victimized" if they reported any instance of cybervictimization (a score of 2 or higher on any item). Those reporting no incidents of victimization across all items (a score of 1) were classified as "non-victimized."

Predictor Variables

Individual-related Variables

Gender was measured based on the respondent's sex, where a value of 1 denoted males and 2 denoted females.

Negative Mood was assessed using a six-item scale from the CVAPCB battery, measuring emotional states such as sadness, anger, fear, and stress over the past two weeks. A five-point Likert scale was employed, where 1 indicated Not at all and 5 indicated Very much, with higher scores indicating greater negative mood states.

Loneliness was measured using the Loneliness Scale, a three-item scale from the CVAPCB battery. This scale measures peer-related loneliness, which is associated with feelings of social disconnection, sadness, and isolation. Responses ranged from 1 (Not at all) to 5 (Very much). Higher scores reflect increased loneliness among adolescents.

Family-related Variables

Parental Supervision was measured using the Parental Supervision Scale, a four-item scale from the CVAPCB battery. The scale measures parental monitoring of adolescents' online activities, setting internet use rules, and discussing online behavior. Participant responses were

collected using a five-point Likert scale, with 1 representing Not at all and 5 representing Almost always, with higher scores indicating greater parental supervision.

Home Belonging was measured using a seven-item scale adapted from the Dutch "Ieder Kind is Anders" study, assessing attachment to home, familial relationships, decision-making freedom, fairness, neighborhood safety, and recreational space availability. Participants rated each item on a scale from 1 (Not at all) to 5 (Very much), with higher scores reflecting a greater sense of belonging at home.

Parental Education Levels were initially measured by directly asking students about their parents' highest educational attainment. Responses were recorded on a categorical scale with the following options: illiterate, elementary, intermediate, diploma, bachelor's degree, master's degree, and above. For analysis purposes, these responses were recoded into three broader categories: low (illiterate, elementary, intermediate), intermediate (diploma), and high (bachelor's degree, master's degree and above).

Peer-related Variables

Peer Acceptance and Rejection were evaluated using a social network approach. To measure these constructs, all students in each classroom were provided with a roster containing the names of their classmates, and asked two questions: "Which classmates are your best friends?" and "Which classmates do you like the least?" (20). Children could nominate an unlimited number of classmates for each question, but they were not permitted to select all classmates. The number of nominations each child received for "best friends" and "dislike" was used to calculate measures of peer acceptance and peer rejection, respectively. To account for variations in class size, these nominations were converted into proportions, resulting in scores ranging from 0 to 1. [For further details on this dyadic peer nomination method, refer to (21)].

School-related Variables

School Victimization was assessed using the global victimization question from the Olweus Bully/Victim Questionnaire (22). Students were asked, "How often have you been bullied by other students at school during your school year?" Participants indicated their experiences on a Likert scale, where 1 corresponded to I haven't been bullied and 5 to I have been bullied several times a week, with higher scores indicating more frequent experiences of victimization. To ensure clarity, the participants were provided with a definition of bullying and various examples illustrating different forms of bullying (22).

Responses were recoded into a binary variable. Students who reported no bullying (response = 1) were categorized as non-victimized (coded as 0). In contrast, those reporting any level of bullying (responses 2–5) were categorized as victimized (coded as 1).

Perceived School Climate was measured using a four-item scale from the CVAPCB battery. The scale measured students' perceptions of their school environment by assessing students' attitudes toward their school and classroom. Participants rated each item on a five-point Likert

scale from 1 (Not at all) to 5 (Very much), with higher scores reflecting a more positive perception of the school climate.

Educational Level was assessed by asking students to indicate their current stage of schooling. Secondary school was coded as 1, and high school as 2.

Statistical Analysis

Prior to analysis, assumption checks were conducted. A missing values analysis was performed to examine the pattern of missing data and determine the most appropriate approach for handling them. To detect outliers, multiple analyses were conducted at different levels: univariate outliers were identified using boxplots; bivariate outliers were assessed through confidence ellipses and influence plots; and multivariate outliers were detected using Mahalanobis distance (23). Linearity of the continuous predictors with the log-odds of cybervictimization was evaluated by plotting the log-odds of cybervictimization against each predictor. Additionally, multicollinearity among predictors was assessed using Tolerance and Variance Inflation Factor (VIF) values (23). After ensuring the quality of the data, the dataset proceeded to the primary analysis. First, descriptive statistics were performed, including frequencies (N, %), means, standard deviations (SD), and minimum and maximum values of the variables. To examine the effects of multiple factors on cybervictimization, binary logistic regression analysis was conducted. Predictor variables were conceptually organized into four domains: individual, family, network, and school levels. Although these constructs reflect multilevel influences, all variables were measured via self-report at the individual level, making binary logistic regression an appropriate analytical approach.

The analysis included both bivariate and multiple logistic regression models. Bivariate logistic regression was conducted to assess the unadjusted association between cybervictimization and each predictor individually. Unadjusted odds ratios (ORs) and their corresponding 95% confidence intervals (CIs) were reported to indicate the strength and direction of these associations.

Multiple logistic regression was then performed, incorporating all predictors simultaneously. Adjusted odds ratios (ORs) with 95% CIs were reported to reflect the independent contribution of each variable to the odds of experiencing cybervictimization. Significance was considered at 0.05.

Model fit was evaluated using the Hosmer and Lemeshow goodness-of-fit test. All statistical analyses were conducted using R (with relevant analytical packages) and SPSS version 27.

Results

Regarding data quality, the analysis indicated that missing data were minimal. A total of three cases were identified as outliers. The scatterplots indicated an approximately linear relationship for all continuous variables and log odds of cybervictimization. Additionally, results from Tolerance and VIF stated the absence of multicollinearity among the predictor variables.

The sample consisted of 592 students, of whom 57.4% were male. The majority (61%) attended secondary school, while 39% were high school students. Approximately one-third of parents had low education levels, with a relatively even distribution across low, intermediate, and high education categories for both mothers and fathers.

Regarding experiences of victimization, 33.4% of students reported school victimization, and 46.8% reported cybervictimization. On average, students reported moderate levels of negative mood and loneliness, alongside relatively high levels of parental supervision, home belonging, and perceived positive school climate. Table 1 presents the descriptive statistics for the study variables.

A binary logistic regression was performed to examine predictors of cybervictimization (Table 2). The model was found to be statistically significant ($\chi^2 = 111.41$, $df = 14$, $P < 0.001$), explained 23% of the variance (Nagelkerke $R^2 = 0.230$), and demonstrated good model fit (Hosmer-Lemeshow test: $\chi^2 = 7.52$, $df = 8$, $P = 0.482$).

In the bivariate analyses, higher negative mood (OR = 1.12, 95% CI: 1.09–1.15), greater loneliness (OR = 1.13, 95% CI: 1.07–1.18), school victimization (OR = 2.48, 95% CI: 1.74–3.51), and being in high school (OR = 1.82, 95% CI: 1.30–2.54) were each associated with increased odds of cybervictimization. In contrast, stronger home belonging (OR = 0.90, 95% CI: 0.87–0.93), higher parental supervision (OR = 0.92, 95% CI: 0.88–0.95), and more positive perceptions of school climate (OR = 0.91, 95% CI: 0.87–0.95) emerged as protective factors.

In the multiple logistic regression model, higher negative mood (OR = 1.08, 95% CI: 1.04–1.12) and school victimization (OR = 2.28, 95% CI: 1.52–3.40) were associated with increased odds of cybervictimization. High

Table 1. Descriptive statistics of the research variables (n = 592)

Variable	N (%)	Mean (SD)
Educational level		
Secondary	361 (61)	
High	231 (39)	
Gender		
Male	340 (57.4)	
Female	252 (42.6)	
Mother's education level		
Low	184 (31.1)	
Intermediate	272 (45.9)	
High	134 (22.6)	
Father's education level		
Low	199 (33.6)	
Intermediate	203 (34.3)	
High	189 (31.9)	
School Victimization		
Non-victimization	394 (66.6)	
Victimization	198 (33.4)	
Cybervictimization		
Non-victimization	315 (53.2)	
Victimization	277 (46.8)	
Negative Mood		16.41 (6.01)
Loneliness		7.15 (3.40)
Home belonging		25.8 (5.34)
Parental Supervision		13.78 (4.68)
Peer Acceptance		0.46 (0.32)
Peer Rejection		0.35 (0.30)
Perceived school climate		15.99 (3.89)

Table 2. Unadjusted and adjusted odds ratios (ORs) and 95% confidence intervals (CIs) from binary logistic regression predicting cybervictimization (n = 592)

Predictor	Unadjusted OR (95% CI)		Adjusted OR (95% CI)	
	OR	95% CI	OR	95% CI
Gender				
Male (Ref)	1.00	-	1.00	-
Female	1.15	0.83-1.60	0.85	0.57-1.25
Negative Mood	1.12 ***	1.09-1.15	1.08 ***	1.04-1.12
Loneliness	1.13 ***	1.07-1.18	1.03	0.96-1.09
Home belonging	0.90 ***	0.87-0.93	0.95 *	0.91-0.99
Parental supervision	0.92 ***	0.88-0.95	0.96 *	0.92-0.99
Mother's education level				
Low (Ref)	1.00	-	1.00	-
Intermediate	0.95	0.65-1.39	0.91	0.57-1.46
High	1.34	0.86-2.1	1.12	0.60-2.09
Father's education level				
Low (Ref)	1.00	-	1.00	-
Intermediate	0.85	0.58-1.27	1.18	0.72-1.92
High	1.18	0.79-1.75	1.43	0.82-2.51
Peer acceptance	1.03	0.62-1.72	1.02	0.58-1.82
Peer rejection	1.49	0.88-2.54	0.99	0.54-1.82
Perceived school climate	0.91 ***	0.87-0.95	0.99	0.93-1.04
School victimization				
Non-victimization (Ref)	1.00	-	1.00	-
Victimization	2.48 ***	1.74-3.51	2.28 ***	1.52-3.40
Educational level				
Secondary school (Ref)	1.00	-	1.00	-
High school	1.82 ***	1.30-2.54	1.86 **	1.25-2.77

Note: OR = Odds Ratio; CI = Confidence Interval; * = $P < 0.05$; ** = $P < 0.01$; *** = $P < 0.001$; Ref = Reference Group

school students were also more likely to experience cybervictimization compared to secondary school students (OR = 1.86, 95% CI: 1.25–2.77, $P < 0.01$). In contrast, stronger home belonging (OR = 0.95, 95% CI: 0.91–0.99) and greater parental supervision (OR = 0.96, 95% CI: 0.92–0.99) functioned as protective factors.

Discussion

The present study investigated the predictors of cybervictimization among adolescents using binary logistic regression analysis, highlighting the influence of individual, family, peer, and school-related variables. The prevalence of cybervictimization in the current study (46.8%) is notably higher than that found in other countries. For instance, studies have reported rates of 22.18% in Spain (24), 17.7% in China (25), and 15.38% in the United States (26). The relatively high prevalence in our sample may be linked to increased adolescent engagement with digital platforms in Iran, where adolescents increasingly rely on digital tools for learning and maintaining social connections. The results revealed that negative mood, school victimization, educational level, home belonging, and parental supervision were significant predictors of cybervictimization, even after adjusting for other variables. Consistent with prior research (27), school victimization emerged as the strongest predictor. Adolescents who experienced victimization at school were over twice as likely to be cybervictimized. Similarly, those who reported higher levels of negative mood were more vulnerable to cybervictimization, consistent with prior research linking emotional distress to online victimization risk (11, 28). Furthermore, educational level was also a significant predictor. High school students were more likely to report cybervictimization compared to secondary school stu-

dents. This finding aligns with previous research indicating that online victimization tends to increase with age (29, 30), unlike traditional bullying, which typically peaks during middle school years (1). High school students generally have greater autonomy, more frequent use of digital communication platforms, and less adult supervision online, which may elevate their risk.

Protective factors also emerged. A strong sense of home belonging and higher levels of parental supervision were associated with reduced odds of cybervictimization. These findings reinforce the importance of familial connectedness and parental monitoring in mitigating online risks, consistent with the previous research (31, 32).

Contrary to several prior studies (10, 26, 33), some theoretically relevant predictors, such as gender and peer relations, were not found to be significant predictors of cybervictimization in the current study. One possible explanation may involve cultural differences in peer interactions and gendered experiences of online behavior. Considering that this research was carried out within the Iranian context, where social norms and digital engagement patterns may differ from Western settings, these contextual dynamics could be relevant. However, as these factors were not directly measured, this interpretation remains speculative and should be explored in future research using culturally sensitive or qualitative methods.

While the study provides meaningful contributions to the literature, several limitations should be noted. We used the convenience sampling method at the school level, where only schools that agreed to participate were included. This method may restrict the generalizability of the findings, since the sample might not accurately reflect the wider adolescent population. Although all students within the selected classrooms participated, the potential for selection bias at the school level remains.

The use of self-reported data for measuring sensitive constructs such as cybervictimization may have introduced recall or social desirability bias. However, the anonymity and confidentiality of the online survey were emphasized to reduce potential response distortion.

Cybervictimization was measured as a binary variable. This approach sacrifices some detail about the frequency and severity of cybervictimization. Future studies should aim to gather larger and more representative samples or use alternative measurement approaches to capture the complexity of cybervictimization experiences more fully.

Because the classroom was the unit of analysis in the current study, peer acceptance and rejection were assessed through in-class social network nominations. While this method captures key peer dynamics in a structured and validated way, it may not reflect interactions with peers outside the classroom or in online-only contexts. Future research is required to consider expanding the network boundaries to include cross-class or digital peer relationships, especially when investigating cyber-related behaviors.

Although the model incorporated a wide range of variables across multiple ecological levels (individual, family, peer, and school), it accounted for 23% of the variance in cybervictimization. This suggests qualitative insights are needed to provide a deeper context-based understanding of the complexity of cybervictimization risk.

Because this study used a cross-sectional design, it is not possible to make causal inferences from the observed associations. Longitudinal studies are required to better determine the direction of the relationships between the predictors and cybervictimization.

Finally, since the study was conducted within the Iranian cultural context, the findings may not be directly applicable to other settings without accounting for sociocultural variations in online behavior, school climate, and peer dynamics.

Despite these limitations, the study offers valuable insights for both research and practice. The strong predictive role of school victimization underscores the need for integrated intervention strategies that address both offline and online experiences. School-based programs should prioritize emotional well-being and resilience training to reduce the risk of cybervictimization. Moreover, future studies should explore potential mediating mechanisms linking offline and online victimization. Finally, given that some of the study results contradict theoretical expectations and previous research, qualitative research could provide deeper insights into the contextual and cultural factors that shape cybervictimization experiences.

Conclusion

This research adds to the expanding literature on cybervictimization by highlighting both risk and protective factors among Iranian adolescents. Consistent with the study's aim to examine multidimensional influences, school victimization, higher negative mood, and being in high school were associated with increased risk of cybervictimization. In contrast, stronger home belonging and greater parental supervision served as protective fac-

tors. These findings emphasize the importance of addressing offline victimization, emotional distress, and family support in prevention efforts. While some expected predictors, such as gender and peer relationships, were not significant, their nonsignificance may reflect context-specific dynamics that merit further study. Future research using longitudinal and mediation-based approaches is recommended to explore causal mechanisms and inform culturally responsive interventions.

Authors' Contributions

S.V.K, H.S, Y.S, and Z.J.S contributed to the design of the study. S.V.K collected the data and drafted the manuscript. S.V.K, Y.S, and Z.J.S assisted in the analysis of the data. S.V.K, H.S, Y.S, and Z.J.S revised the manuscript. All authors read and approved the final manuscript.

Ethical Considerations

The authors affirm that all procedures involved in this study adhered to the ethical standards of the relevant national and institutional committees on human experimentation, as well as to the principles of the 1975 Helsinki Declaration, revised in 2013. All human-related procedures received approval from the Ethics Committee of the University of Social Welfare and Rehabilitation Sciences in Iran (IR.USWR.REC.1398.063). Informed parental consent and child assent were obtained before initiating data collection, and the confidentiality of the data was ensured. No personally identifying information was collected from participants, ensuring full anonymity throughout the study.

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Conflict of Interests

The authors declare that they have no competing interests.

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