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RESEARCH ARTICLE

Indonesian Adolescents' Perceptions of Peers versus Influencer Tobacco Content on Social Media and Smoking Attitudes

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ABSTRACT

Introduction: Adolescents may encounter smoking-related material from people they know as well as from prominent online personalities. Although both groups are visible on social media, young audiences may evaluate their messages differently. Evidence comparing these source perceptions within the same Indonesian respondents remains limited. We examined how adolescents rated smoking-related content attributed to peers and influencers and whether their reported exposure frequency was associated with attitudes toward smoking.

Methods: An online cross-sectional survey included 472 Indonesian adolescents aged 13–19 years. Participants reported how often they encountered smoking-related social-media content, rated peer- and influencer-attributed content on appeal, professionalism, perceived ability to influence, and self-identification, and completed smoking-attitude items. Paired source ratings were compared using Wilcoxon signed-rank tests. Spearman's rank correlation assessed the unadjusted association between ordinal exposure frequency and the retained dichotomised attitude measure.

Results: Of the 472 respondents, 304 (64.4%) reported frequently encountering smoking-related content. TikTok was the most commonly reported primary social-media platform (55.9%); the survey did not establish where smoking-related content was encountered. Median ratings favoured influencer-attributed content for appeal (4.0 vs. 3.0; $p = 0.012$), professionalism (4.0 vs. 2.0; $p = 0.007$), and perceived ability to influence (4.0 vs. 2.0; $p = 0.018$). Only appeal and professionalism met the Bonferroni-adjusted threshold of $p \leq 0.0125$. Self-identification did not differ significantly ($p = 0.111$). Exposure frequency showed a positive unadjusted association with the dichotomised smoking-attitude measure ($\rho = 0.312$; $p < 0.01$).

Conclusion: Adolescents in this non-probability online sample rated influencer-attributed smoking content as more appealing and professional than peer-attributed content. Those reporting more frequent exposure also tended to report more favourable smoking attitudes. As source categories were evaluated without standardised posts and data were collected at one time point, these findings do not demonstrate persuasive effects or establish causality. Further studies should examine actual content exposures using longitudinal or experimental designs.

Keywords: Adolescent; Social Media; Tobacco Smoking; Peer Influence; Persuasive Communication

INTRODUCTION

Tobacco use during adolescence is an important public-health concern because smoking initiated at a young age may continue into adulthood, with substantial health consequences (1,2). In Indonesia, youth tobacco use remains relevant to prevention policy. The Global Youth Tobacco Survey provides information on tobacco use among school-going adolescents (3), although it should not be used on its own to infer a time trend among all Indonesian adolescents aged 10–18. Preventing early tobacco uptake therefore requires attention not only to access to products but also to the environments in which young people encounter smoking-related messages.

In the digital era, adolescent risk behaviour is increasingly encountered within social media environments (4). Platforms such as TikTok and Instagram are important spaces for identity formation and lifestyle presentation (5–7), and adolescents may encounter smoking-related images and videos within these environments. Social Cognitive Theory (SCT) provides an interpretive context for considering how observed social models and source characteristics may relate to attitudes (8–10). In the present study, however, SCT was not tested as a complete causal model. The measured dimensions are treated as distinct source-perception constructs: appeal may relate to attention to a message; professionalism reflects perceived production or delivery quality; perceived ability to influence reflects respondents' appraisal of persuasive potential; and self-identification reflects perceived relatability or identification. The study did not directly measure observational learning, outcome expectancies, reinforcement, self-efficacy, behavioural imitation, or temporal change in attitudes. Influencers are often perceived by adolescents as successful, attractive, and relatable figures (11–14). When these public figures portray smoking, whether overtly or through subtle lifestyle product placement, such material may be perceived differently from content shared by peers. Previous studies have examined associations between exposure to tobacco-related social-media content and e-cigarette-related attitudes or intentions among young people (6,15,16). However, much of the existing literature examines social media influence broadly, often failing to distinguish between the specific impacts of peer-generated versus influencer-generated content.

Previous research has linked social-media tobacco exposure with tobacco-related attitudes or intentions and has separately examined influencer-related effects and peer influence (6,14–18). Nevertheless, the evidence cited here does not establish a direct within-respondent comparison of peer- versus influencer-attributed smoking content across the four perception dimensions assessed in this study, and comparable Indonesian evidence remains limited. Accordingly, this study aimed to describe self-reported exposure to smoking-related content, compare ratings of peer- and influencer-attributed content for appeal, professionalism, perceived ability to influence, and self-identification, and examine the association between exposure frequency and smoking attitudes. Formal hypotheses were not documented as pre-specified before inspection of the data. Therefore, the anticipated differences between source ratings and the positive exposure–attitude association are described as exploratory analytical expectations rather than confirmatory a priori hypotheses. All corresponding analyses are interpreted as exploratory cross-sectional analyses and not as tests of pre-specified causal pathways. This study therefore focuses on source-specific perceptions rather than claiming that influencer content causes or accelerates normalization. Its contribution is the within-respondent comparison of four distinct perception dimensions for peer- and influencer-attributed smoking content in an Indonesian online sample, together with an analysis of the unadjusted association between self-reported exposure frequency and smoking attitudes.

METHODS

Research Type

This study employed a quantitative analytical cross-sectional design. The study examined paired differences in respondents' ratings of abstract peer- versus influencer-source descriptions and the unadjusted association between self-reported frequency of exposure to smoking-related content and smoking-attitude scores. Because exposure and outcome were measured at the same time, the design does not establish temporal ordering or causality.

Population and Sample

The target population consisted of adolescents aged 13–19 years residing in Indonesia who were active social media users. The minimum sample size was estimated using a single-population proportion formula with a 95% confidence level, 5% precision, and an assumed proportion of 0.50, resulting in a minimum requirement of 384 participants. This calculation was used to establish the minimum recruitment threshold rather than as an analytical power calculation specifically for the paired Wilcoxon Signed-Rank or Spearman's rank correlation analyses. Data collection was conducted throughout the prespecified recruitment period. Recruitment was therefore not terminated immediately after the minimum sample size of 384 participants had been reached. By the end of the data-collection period, 472 respondents met the eligibility criteria and were included in the previously reported analytical sample. Thus, the difference between the minimum required sample size (n = 384) and the previously reported analytical sample (n = 472) reflects continued recruitment during the predefined data-collection period rather than a post-hoc increase in sample size based on the study findings. Counts of individuals who accessed the survey link, reached the consent/assent page, started but did not complete the questionnaire, or were excluded before the final analytical file were not retained and therefore cannot be reconstructed reliably. Item-level missingness records and a separate missing-data handling log were also not retained. Consequently, the original missing-data rule cannot be verified retrospectively, and the manuscript does not claim a complete-case or imputation procedure that is not documented. The previously reported Spearman analysis sample size is n = 472; per-dimension Wilcoxon analysis sample sizes are not

provided in the available documentation and therefore cannot be reported. With n = 472, a two-sided correlation test at α = 0.05 has approximately 80% power to detect a correlation of about |ρ| = 0.13; this sensitivity calculation is reported only to characterise the achieved analytical sample and does not imply that this effect size was prespecified.
A combination of purposive and snowball sampling techniques was used to recruit participants through an online questionnaire. The questionnaire link was distributed through WhatsApp, Instagram, TikTok, and Telegram using adolescent community networks, school-based communication groups, and peer-sharing mechanisms. Eligibility required participants to be 13–19 years old, active social-media users for at least one hour per day, and to provide the required informed consent or assent. Recruitment was non-probability based; therefore, the final sample should not be interpreted as nationally representative. Data collection continued throughout the prespecified April–July 2025 recruitment period, and 472 eligible respondents were included in the final analysis.

Research Location

Data collection was conducted entirely online from April to July 2025. Recruitment reached respondents from Java, Sumatra, Kalimantan, Sulawesi, and Bali through the investigators' and participants' social-media networks. Region-specific counts, province-level coverage, and rural/urban residence were not retained as variables in the final analytical file; therefore, geographic proportions cannot be reported without unsupported reconstruction. Recruitment was not allocated proportionally by region. The geographic description indicates recruitment reach only and should not be interpreted as evidence that the sample represents the geographic distribution of Indonesian adolescents.

Instrumentation or Tools

This study used a structured online questionnaire with four sections. The first collected demographic characteristics and social-media use. The second assessed self-reported frequency of encountering smoking-related content using the three ordered response categories recorded in the original dataset (rarely, occasionally, frequently). The available study documentation does not preserve a validated quantitative frequency anchor or a separate platform-specific exposure variable; accordingly, the manuscript does not reinterpret these categories as exact weekly frequencies and does not claim that exposure occurred primarily on TikTok. The exposure item referred to smoking-related social-media content as presented in the questionnaire; because separate indicators for combustible cigarettes, electronic cigarettes, branded promotion, and incidental imagery were not retained, these content subtypes cannot be disaggregated in the present analysis. The three-category exposure variable was coded ordinally (1=rarely, 2=occasionally, 3=frequently) for the Spearman analysis.
The third section compared perceptions of smoking-related content attributed to peers versus influencers. Respondents evaluated abstract source descriptions rather than standardised posts, images, videos, or vignettes, and they were not asked to recall one specific post. Peer-generated content was described as content from individuals in the respondent's immediate or known social circle, whereas influencer-generated content referred to content from digital public figures. The same conceptual dimensions were assessed for both source categories: content appeal, perceived professionalism, perceived ability to influence, and self-identification. Thus, the paired comparison reflects beliefs about source categories rather than observed persuasion by standardised content. The available manuscript description does not document randomisation or counterbalancing of source order; order and common-method effects therefore cannot be excluded and are treated as limitations. The perception instrument comprised four conceptually distinct dimensions: content appeal (4 items), perceived professionalism (4 items), perceived ability to influence (5 items), and self-identification (4 items), each rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). No overall perception score was intended; higher scores indicate stronger endorsement of the specific dimension and should not automatically be interpreted as approval of smoking, normalisation, or actual persuasion. The smoking-attitude instrument consisted of six items assessing the degree to which respondents perceived smoking as socially acceptable, modern, or normative. The previously reported analysis used the median-dichotomised attitude variable (less favourable vs. more favourable attitude) in the reported Spearman analysis, rather than the unreduced six-item total score. The higher category represented a more favourable attitude toward smoking. The unreduced attitude scores, their possible range, and the original missing-item handling rule cannot be verified from the available documentation. The correlation therefore could not be recalculated using the unreduced scores. Dichotomisation reduces score information and uses a sample-dependent threshold, and this is acknowledged as a measurement and analytical limitation. The questionnaire was informed by Social Cognitive Theory and developed conceptually with reference to prior literature on youth social-media/tobacco engagement (15), influencer-related effects (14), and adolescents' appraisal of social-media information sources (13). These publications informed the conceptual domains rather than serving as a single previously validated instrument from which the present item sets were reproduced. The available manuscript does not provide an item-by-item source map. In this study, Social Cognitive Theory is used as interpretive context rather than as a fully tested causal model. Appeal is interpreted as a source/message characteristic relevant to attention; professionalism as a perceived production/source characteristic; perceived ability to influence as respondents' appraisal of persuasive potential; and self-identification as perceived relatability to the source. Observational learning, reinforcement, self-efficacy, behavioural imitation, and temporal mediation were not directly measured. Before field administration, three experts in public health and adolescent psychology reviewed the items for relevance, clarity, and conceptual appropriateness. The previous manuscript describes this qualitative expert review but does not report a quantitative content-validity index or other numerical expert-agreement statistic. The available study materials do not document a formal translation/back-translation procedure, a separate cultural-adaptation protocol, or a pilot-testing stage; these procedures are therefore not retrospectively claimed. The previously reported corrected item-total correlations above 0.30 are treated as item-discrimination/internal-consistency evidence, not as

stand-alone proof of construct validity. Internal consistency in the analytical instrument was acceptable for content appeal (α=0.82), professionalism (α=0.85), perceived ability to influence (α=0.80), self-identification (α=0.78), and smoking attitudes (α=0.84). Separate peer- and influencer-form alpha (α) coefficients and factor-analytic evidence were not available in the previously reported analysis and are therefore not reported. The original item-level questionnaire wording is unavailable and therefore cannot be verified or supplied as supplementary material. Accordingly, the present report is limited to the instrument structure, conceptual basis, qualitative expert-review procedure, and reliability statistics previously reported in the manuscript; no unverified item wording, quantitative content-validity index, formal translation/back-translation procedure, separate cultural-adaptation protocol, or pilot-testing procedure has been reconstructed or claimed. The surviving study documentation does not specify whether the items within each perception dimension were aggregated by a sum, mean, median, or another rule, nor does it establish the derived-score range or how missing perception-item responses were handled. Consequently, the use of a uniform aggregation procedure for the peer and influencer ratings and the paired Wilcoxon analyses cannot be independently verified from the available records. The original questionnaire, data files and scoring syntax are not available for verification. The original attitude-scoring procedure, coding direction, numerical median cut-off and rule for assigning observations equal to the median cannot therefore be independently verified. The direction described above reflects the existing manuscript description rather than a new check of the original coding. No scoring or classification procedure has been reconstructed retrospectively.

Data Analysis

Statistical analyses were conducted using SPSS version 25. Because the same respondents rated both peer- and influencer-source descriptions, the Wilcoxon Signed-Rank test was used to compare the paired perception scores across the four dimensions. Spearman's rank correlation was used to examine the association between the three-level ordinal exposure-frequency variable and the median-dichotomised smoking-attitude variable retained in the previously reported analysis. Because the unreduced six-item attitude total was not preserved in the analytical materials available for this revision, the reported coefficient could not be re-estimated using the unreduced score. The nominal significance level was set at $\alpha = 0.05$. Because four paired perception dimensions were tested, the family-wise error rate was additionally considered using a Bonferroni (19) correction. Accordingly, the conventional significance level of $\alpha = 0.05$ was divided by the four comparisons, yielding an adjusted significance threshold of $\alpha = 0.0125$. This adjustment was applied as a conservative sensitivity analysis for the four Wilcoxon Signed-Rank comparisons. Under this adjusted threshold, the differences in appeal ($p = 0.012$) and professionalism ($p = 0.007$) remained statistically significant, whereas perceived ability to influence ($p = 0.018$) did not; self-identification remained non-significant ($p = 0.111$).

Ethical Approval

This study received ethical approval from the Health Research Ethics Committee of STIKES Yayasan RS Dr. Soetomo on 5 February 2025 (No. 011/KEPK/STIKESYRSDS/II/2025). Participation was voluntary. Participants aged 18–19 years provided electronic informed consent. For participants younger than 18 years, guardian permission was obtained before adolescent assent and questionnaire access, in accordance with the approved protocol.

RESULTS

The final analytical sample comprised 472 social-media users aged 13–19 years. Results are presented in three parts: participant characteristics and reported exposure, paired ratings of peer- and influencer-attributed content, and the association between exposure frequency and smoking attitudes.

Respondent Characteristics and Exposure Levels

Table 1 summarises participant characteristics and social-media use. TikTok was named as the primary platform by 55.9% of respondents and Instagram by 34.3%. This question concerned general platform use, not the platform on which respondents saw smoking-related posts. Separately, 304 participants (64.4%) classified their exposure to smoking-related social-media content as frequent.

Table 1. Respondent Characteristics

Characteristics	Description	Frequency	%
Age (years)	13–15	134	28.4
	16–17	194	41.1
	18–19	144	30.5
Gender	Male	214	45.3
	Female	258	54.7
Daily Social Media Usage	< 2 hours	57	12.1
	2–4 hours	182	38.6
	> 4 hours	233	49.4
Primary Platform	TikTok	264	55.9
	Instagram	162	34.3
	Facebook	20	4.2
	Others	26	5.5

Characteristics	Description	Frequency	%
Frequency of Exposure to Smoking Content	Rarely	85	18.0
	Occasionally	83	17.6
	Frequently	304	64.4

Perceptions of Smoking Content: Peers vs. Influencers

As shown in Table 2, median ratings were higher for influencer- than peer-attributed content on appeal (4.0 vs. 3.0; p = 0.012), professionalism (4.0 vs. 2.0; p = 0.007), and perceived ability to influence (4.0 vs. 2.0; p = 0.018). Self-identification had a median of 3.0 for both source categories (p = 0.111). Although the first three comparisons met the nominal 0.05 threshold, only appeal and professionalism remained significant with the Bonferroni threshold of 0.0125. The previously documented results do not provide the per-comparison sample sizes, interquartile ranges, Wilcoxon statistics, counts of tied pairs, or paired effect sizes; those results cannot be added reliably. These comparisons concern how respondents rated source descriptions, not experimentally observed persuasion.

Table 2. Comparison of Perceptions Between Peer and Influencer Smoking Content

Perception Variable	Median Peers	Median Influencer	p-value
Content appeal	3.0	4.0	0.012†
Impression of professionalism	2.0	4.0	0.007†
Ability to influence	2.0	4.0	0.018‡
Self-identification	3.0	3.0	0.111

†Statistically significant at the Bonferroni-adjusted threshold (p ≤ 0.0125). ‡Nominally significant at p < 0.05 but not significant after Bonferroni adjustment. Wilcoxon Signed-Rank Test. Per-comparison n, IQRs, Wilcoxon statistics, ties/zero differences, and paired effect-size estimates were not recoverable from the preserved analytical output

Correlation Between Exposure and Attitudes

Spearman's rank correlation (Table 3) showed a positive association between the three-level exposure-frequency variable and the median-dichotomised smoking-attitude variable (ρ = 0.312; p < 0.01; n = 472). Based on an approximate Fisher z transformation, the 95% confidence interval for ρ was approximately 0.228 to 0.391. Because the attitude variable was dichotomised at the sample median, the coefficient should be interpreted as an ordinal association with the retained two-category attitude measure rather than as an association with the unreduced six-item attitude total. The result is unadjusted and cross-sectional and does not establish temporal ordering, change in attitudes, or a causal effect of exposure.

Table 3. Correlation Between Exposure Frequency and Positive Attitudes Toward Smoking

Variable	ρ (rho)	p-value
Frequency of exposure x Positive attitude	0.312	< 0.01**

**Statistically significant at p < 0.01, Spearman's rho correlation

DISCUSSION

Two features of the sample warrant separate attention. Almost half of participants reported using social media for more than four hours per day, and 64.4% reported frequent exposure to smoking-related content. The survey did not test whether these two measures were related. Similarly, although TikTok was the most commonly named primary platform, respondents did not identify which platform carried the smoking-related material they encountered. Neither an exposure–duration relationship nor a TikTok-specific exposure pattern can therefore be inferred from Table 1.

Respondents rated influencer-attributed content more highly for appeal and professionalism, even after adjustment for the four paired comparisons. The perceived ability to influence differed only at the nominal significance level. This pattern suggests that adolescents distinguish between source categories, particularly in how engaging and professionally presented they expect the content to be. Social Cognitive Theory can inform interpretation of these appraisals (10,20–22), but the questionnaire did not measure observational learning, reinforcement, self-efficacy, or actual imitation. Differences in perceived production quality, conventions of influencer posting, or familiarity with online personalities offer other possible explanations. With p = 0.111, the self-identification comparison provides insufficient evidence of a difference; it does not establish that the two sources were perceived as equivalent.

The exposure–attitude association (ρ = 0.312) also deserves a cautious reading. Earlier studies have reported relationships between tobacco-related social-media content and smoking-related attitudes, risk perceptions, or susceptibility (16,23,24). However, the present study did not directly measure the Mere Exposure Effect, algorithmic amplification, positive framing, or a process of gradual normalisation. These mechanisms therefore remain plausible hypotheses rather than demonstrated explanations for the observed association. Reverse causation and selective exposure are also possible; adolescents with more favourable pre-existing attitudes toward smoking may be more likely to notice, seek, or engage with smoking-related content. Accordingly, whether repeated exposure specifically contributes to the normalisation or perceived social acceptability of smoking cannot be established from the present cross-sectional data. Longitudinal or experimental studies are therefore needed to establish temporal ordering and determine whether repeated exposure contributes to changes in smoking attitudes over time. From a public-health perspective, the findings support continued surveillance and evaluation of tobacco-related

content encountered by adolescents on social media, consistent with previous calls for strengthened monitoring of digital tobacco marketing and promotion (25,26). The present study did not identify sponsorship, paid promotion, influencer partnerships, youth targeting, or regulatory compliance; therefore, it cannot estimate the prevalence or effects of these practices. Digital media literacy and appropriate regulatory responses have been proposed as potential strategies for addressing young people's exposure to tobacco-related content in digital environments (27,28); however, their effectiveness was not evaluated in the present study. Future intervention and policy evaluations should assess whether such approaches reduce exposure or modify tobacco-related attitudes and behaviours.

Several limitations should be considered when interpreting these findings. First, the cross-sectional design precludes causal inference and does not establish the temporal relationship between exposure to smoking-related content and attitudes toward smoking. Therefore, the observed association should not be interpreted as evidence that exposure caused changes in adolescents' smoking attitudes. Second, participants were recruited using a non-probability online sampling approach, which may have introduced selection bias and limits the generalisability of the findings beyond adolescents represented in this online sample. Adolescents with greater access to the internet or higher levels of social-media engagement may have been more likely to participate. Third, exposure to smoking-related content was self-reported using broad frequency categories, which may be subject to recall bias and classification variability and may not capture differences in the intensity, duration, or characteristics of exposure. The study also did not differentiate exposure according to the specific social-media platform on which smoking-related content was encountered; therefore, the predominance of a particular platform among respondents should not be interpreted as evidence that most smoking-related exposure occurred on that platform. Fourth, respondents evaluated abstract descriptions of peer- and influencer-generated smoking-related content rather than standardised content stimuli. Consequently, the observed differences reflect perceptions of source categories rather than responses to identical smoking-related messages presented by different sources and should not be interpreted as evidence of actual persuasive effects. The study also did not examine specific content characteristics, such as message framing, visual aesthetics, sponsorship, or promotional intent, which may influence how tobacco-related content is perceived. Finally, the association between exposure frequency and attitudes toward smoking was based on an unadjusted bivariate analysis using a median-dichotomised attitude variable, which reduces information relative to the unreduced six-item score. Current smoking status and current vaping status were not retained as variables in the analytical materials available for this revision and therefore could not be included as covariates in an adjusted or sensitivity analysis. These behaviours are important potential unmeasured confounders because they may be related to both exposure to smoking-related content and attitudes toward smoking. Residual confounding by other individual, social, and social-media-related factors also cannot be excluded. Reverse causation and selective exposure are plausible alternative explanations, whereby adolescents with more favourable pre-existing attitudes toward smoking may be more likely to notice, seek, or engage with smoking-related content. Longitudinal and experimental studies using more detailed exposure measures, standardised content stimuli, and relevant potential confounders are needed to clarify the temporal and potentially causal relationships between social-media exposure and adolescents' smoking-related attitudes. Future research should employ longitudinal or experimental designs to establish temporal ordering and further examine potential causal pathways between exposure to smoking-related content on social media, source perceptions, attitudes toward smoking, and subsequent smoking behaviour. Experimental studies using standardised content stimuli could help distinguish the effects of content source from those of message characteristics, while longitudinal studies could determine whether exposure precedes changes in smoking-related attitudes over time. Further studies should also examine different types of influencers and specific content characteristics, including emotional appeal, narrative framing, visual aesthetics, sponsorship, and promotional intent, as these features may shape adolescents' responses to tobacco-related content. Potential protective factors, particularly digital media literacy, should also be investigated to determine whether they modify the relationship between social-media exposure and smoking-related attitudes. More diverse and representative recruitment across Indonesian regions would strengthen external validity and provide a clearer understanding of potential geographic and sociodemographic variation. Finally, where relevant covariates are available, multivariable analyses should be used to account for potential confounding in the association between exposure to smoking-related content and attitudes toward smoking. An additional limitation concerns verification of the reported analyses. The original participant-level dataset, questionnaire and scoring syntax are unavailable. The aggregation rules for perception scores and the original attitude-scoring and dichotomisation rules therefore cannot be independently verified, and the reported statistics cannot be reproduced from the original study files. These documentation gaps limit confidence in the reproducibility of the reported comparisons and association.

CONCLUSION

Among adolescents in this non-probability online sample, influencer-attributed smoking-related content received higher ratings for appeal and professionalism than peer-attributed content, with these differences remaining statistically significant under the conservative Bonferroni-adjusted threshold. Perceived ability to influence differed at the conventional significance level but did not meet the Bonferroni-adjusted threshold, while there was no statistical evidence of a difference in self-identification. More frequent self-reported exposure to smoking-related content was positively associated with more favourable attitudes toward smoking in an unadjusted cross-sectional analysis. These findings reflect adolescents' perceptions of abstract source categories and an exposure–attitude association and should not be interpreted as evidence that influencer-generated content caused changes in smoking attitudes or behaviour. The findings support continued surveillance and evaluation of tobacco-related content encountered by adolescents on social media, while longitudinal and

experimental studies using standardised content stimuli, more representative samples, and appropriately adjusted analyses are needed to clarify temporal and potentially causal relationships.

DECLARATIONS

Author contributions: Diah Wijayanti Sutha (DWS): Conceptualization; Methodology; Supervision; Writing – original draft. Christine (CH): Formal analysis; Writing – original draft. Siti Novianti (SN): Methodology; Writing – review & editing. Asri Handayani Solihin (AHS): Methodology; Validation. Eka Wilda Faida (EWF): Project administration; Data curation; Writing – original draft. Serlly Frida Drastyana (SFD): Formal analysis. Anif Prasetyorini (AP): Writing – review & editing. All authors read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Conflicts of interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. There are no conflicts of interest to disclose.

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Data Availability: The original participant-level dataset, questionnaire and scoring syntax are not available for verification or sharing. The numerical results reported in this manuscript therefore cannot be independently reproduced from the original study files.

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