Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

fSocial media-derived fear of medical disputes and defensive behaviours in emergency pain management: a cross-sectional study

lihua Bai
Guangyuan central hospital
Linhe yang
Guangyuan central hospital
Xiuli Zhu
Zigong First People's Hospital
Chenmo Shi
Zhejiang Provincial People's Hospital
Zhenyu Luo
549291787@qq.com

Guangyuan central hospital
Shun Zhou
Guangyuan central hospital

Research Article

Keywords: defensive medicine, social media, fear, pain management, emergency department, knowledge-practice gap, medical disputes

Posted Date: June 19th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9920125/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

Background

Defensive behaviours in pain management among emergency clinicians have drawn growing attention, yet the role of social media-derived fear remains unclear. We investigated whether clinicians who report greater fear of medical disputes from social media exposure also show more defensive behaviours in acute pain management.

Methods

We surveyed staff at five tertiary hospital emergency departments in China between November 2025 and February 2026. Of 170 questionnaires distributed, 141 were retained after exclusions. We used multivariable logistic regression with interaction terms, stratified analyses, and McNemar's test.

Results

Defensive behaviours were present in 35.5% (50/141) of participants. Each one-standard-deviation increase in social media-derived fear was associated with higher odds of defensive behaviours (OR 2.16, 95% CI 1.41–3.31; P < 0.001). The strength of this association differed by professional category (interaction P = 0.035): among physicians the OR was 5.68 (95% CI 2.04–15.81), whereas among nurses it was 1.41 (95% CI 0.86–2.32), though the physician estimate is imprecise. Personal history of medical disputes showed the strongest independent association (OR 6.41, 95% CI 2.18–18.88; P < 0.001). Among 138 participants with complete data, 80.4% demonstrated adequate knowledge yet only 54.3% reported consistent practice; the gap was wider in the highest than the lowest fear tertile (55.9% vs. 26.8%; P for trend = 0.012).

Conclusions

Social media-derived fear of medical disputes was associated with defensive pain management behaviours. The knowledge-practice gap widened with increasing fear, suggesting that fear may be a modifiable barrier. Whether the apparent moderation by professional category reflects a true difference or sparse-data artefact is unclear.

Introduction

Pain management in emergency departments (EDs) remains suboptimal: analgesic provision often falls short of guideline recommendations even when protocols are in place [1–3]. Although the European Society for Emergency Medicine has reinforced timely and adequate pain relief as a fundamental patient right in its updated guidelines [3], the gap between evidence and practice persists. Defensive medical

behaviours—decisions driven by liability concerns rather than clinical need—may be an underappreciated contributor to this problem.

Defensive medicine encompasses both positive behaviours (ordering unnecessary tests or procedures) and negative behaviours (avoiding high-risk patients or procedures), undertaken primarily to reduce liability exposure rather than to benefit the patient [4, 5]. In China, escalating doctor-patient tensions and widely publicised incidents of workplace violence against clinicians have amplified defensive practice [6, 7]. Survey data indicate that defensive medicine is prevalent among Chinese physicians and may inflate healthcare costs while compromising care quality [8].

Social media may shape how clinicians perceive risk through a mechanism that has received little empirical attention. In China, platforms such as Weibo and WeChat frequently carry narratives about medical disputes and violence against clinicians [9, 10], which may amplify perceived threat beyond what objective risk estimates would suggest. We use the term “social media-derived fear of medical disputes” to describe the fear that arises from exposure to such narratives; it encompasses the frequency of exposure, the emotional responses elicited, and the perceived influence on clinical decisions. Whether this form of fear predicts defensive practice in emergency pain management is unknown.

Three bodies of theory help explain why social media-derived fear might drive defensive practice. Conservation of Resources (COR) Theory [11] holds that individuals act to protect their resources when threatened; defensive prescribing or avoidance of high-risk analgesic decisions can be understood as resource conservation. Social Exchange Theory [12] posits that perceived threats erode the trust-based clinician–patient relationship, pushing providers toward self-protective patterns. The affect heuristic and related judgment frameworks [13] further suggest that emotionally charged information—such as sensationalised medical dispute narratives on social media—can bias risk assessment independently of objective probabilities.

The knowledge-practice gap—the discrepancy between what healthcare professionals know and what they actually do—is particularly relevant here. Even clinicians with adequate knowledge of pain management principles may face barriers that prevent consistent application [14, 15]. Studies in Chinese hospitals have documented such gaps among nurses [16, 17], yet whether fear and defensive attitudes widen them has received little attention.

Accordingly, we aimed to examine (1) whether social media-derived fear of medical disputes is associated with defensive behaviours in acute pain management, (2) whether this association differs between physicians and nurses, and (3) the extent of the knowledge-practice gap and whether it varies with fear levels.

Methods

Study Design and Setting

A cross-sectional survey in accordance with the Declaration of Helsinki was conducted at five tertiary hospital emergency departments across China between November 2025 and February 2026. The Institutional Review Board of Guangyuan Central Hospital approved the protocol (approval number: GYZXLL2026007). Participants provided electronic informed consent by reading the consent statement and clicking an agreement button before accessing the questionnaire.

Participants and Sample Size

We used convenience sampling. Emergency physicians and nurses with at least six months of ED experience were eligible. Temporary or rotating staff not primarily assigned to the ED, administrative staff without direct patient care responsibilities, and those who declined to participate were excluded.

We estimated the required sample size a priori using G*Power 3.1.9.7. For multivariable logistic regression with eight predictors, assuming an OR of 1.8 for the primary predictor, baseline defensive behaviour prevalence of 35%, R^2=0.15 for the remaining covariates, alpha = 0.05 (two-tailed), and power = 0.80, G*Power indicated 128 participants; we targeted 170 to allow for exclusions. Of 170 distributed questionnaires, 162 were returned (95.3%). 21 questionnaires were excluded using sequentially applied criteria: 13 showed extreme response patterns indicative of careless responding (straight-lining all DMS items at the minimum value or completion time under 3 minutes), 8 gave inconsistent responses across paired knowledge items (contradicting paired statements in more than two pairs; see Measures). No questionnaire met more than one exclusion criterion, leaving 141 for the primary analyses.

Three further participants had incomplete responses on the practice scale (missing data on one or more practice items) and were excluded from the knowledge-practice gap analysis only, yielding 138 for that sub-analysis (Fig. 1).

Measures

Social Media-Derived Fear of Medical Disputes

The 6-item Malpractice Fear Scale by Katz et al. [18] was adapted to the context of social media exposure in Chinese emergency settings. The original scale measures fear of malpractice litigation (Cronbach's α = 0.84–0.87). Our 12-item version covers three dimensions: Exposure Frequency (4 items), Emotional Response (4 items), and Perceived Behavioural Influence (4 items), rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Content validity was evaluated by an expert panel of five emergency medicine specialists. Internal consistency in the present sample was good: Cronbach's α = 0.90 for the total scale, and 0.83–0.86 for the three subscales. An exploratory factor analysis using polychoric correlations and principal axis factoring with promax rotation confirmed the three-factor structure; factor retention was guided by

parallel analysis. All items loaded > 0.70 on their respective factors with no cross-loadings > 0.30. The three factors explained 68.7% of the common variance.

Defensive Behaviours in Pain Management

An 8-item adaptation of the Defensive Medicine Scale (DMS) was used for pain management contexts [19]. The original DMS was validated in Chinese. Our version retained the two-factor structure (Positive and Negative Defensive Medicine, 4 items each) with item wording contextualised to acute pain management scenarios. Items were rated on a 5-point Likert scale (1 = never to 5 = always), yielding scores from 8 to 40.

In our sample, the adapted DMS showed acceptable internal consistency (Cronbach's α = 0.75). Confirmatory factor analysis supported the two-factor structure with adequate fit for the sample size ($\chi^2/df = 2.89$, CFI = 0.91, RMSEA = 0.08, SRMR = 0.06). For inferential analyses, we classified defensive behaviour as present when participants scored above the sample median (> 23). Because the DMS yields integer scores and many participants scored exactly at the median (23), 50 participants (35.5%) scored strictly above the median. We chose this threshold over the standard median split (≥ median vs. <median) because including the 21 participants at the median in the "high" group would have conflated elevated defensive tendencies with average-range responding. This non-standard dichotomisation produces an imbalanced split (35.5% vs. 64.5%) that reduces statistical power relative to a balanced 50/50 split; the effective sample size for detecting the same effect is approximately 85–90% of what a balanced split would yield. We acknowledge this limitation and note that the direction of bias is conservative (i.e., toward the null).

Pain Management Knowledge and Practice

Knowledge was assessed using a 20-item questionnaire developed from published guidelines [3, 20], covering pain assessment (5 items), pharmacological interventions (8 items), non-pharmacological interventions (4 items), and special populations (3 items). Each item was scored correct (1) or incorrect (0). Adequate knowledge was defined as a score of at least 14 (≥ 70% correct) [17].

Among the 20 knowledge items, eight were phrased as incorrect statements (items 2, 7, 9, 13, 15, 17, 19, and 20) and required a "false" response to be scored correct. Five of these (items 9, 13, 15, 17, and 19) were incorporated into conceptually paired item sets that also served to detect inconsistent responding; the remaining three (items 2, 7, and 20) assessed knowledge only. We identified five conceptually paired item sets in which one item stated a correct proposition and the other stated a contradictory incorrect proposition within the same clinical domain: (1) item 8 versus item 9; (2) item 10 versus item 13; (3) item 14 versus item 15; (4) item 16 versus item 17; (5) item 6 versus item 19. Participants who endorsed an incorrect statement as correct or contradicted the paired correct statement in more than two pairs were flagged as inconsistent responders and excluded.

The practice was measured through self-reported frequency of applying evidence-based pain management across five scenarios: (1) opioid administration for severe acute pain, (2) multimodal analgesia, (3) reassessment within 30 minutes, (4) non-pharmacological adjuncts, and (5) patient education. Each scenario was rated on a 5-point scale (1 = never to 5 = always). We defined consistent practice as reporting “usually” or “always” (≥ 4) in at least 4 of 5 scenarios (≥ 80%). The knowledge threshold was set at ≥ 70% (≥ 14/20 items correct), following the convention used in comparable studies of pain management knowledge among Chinese nurses [17]. The practice threshold was set at ≥ 80% (≥ 4/5 scenarios), a higher bar chosen for two reasons: first, the practice scale has only five items, and a 70% threshold (≥ 3.5, rounded to 4/5) would coincide with the 80% threshold, providing no differentiation; second, we considered that consistent clinical practice demands a higher standard than knowledge recall alone—knowing a guideline does not guarantee its application, and a more stringent practice criterion captures meaningful behavioural consistency. This asymmetric threshold (70% knowledge vs. 80% practice) may overestimate the gap relative to a symmetric standard; we therefore conducted sensitivity analyses across multiple thresholds (60–90%) to assess robustness (Table 5). The practice scale showed modest internal consistency (Cronbach’s α = 0.72), reflecting the heterogeneity of the clinical scenarios; this imperfect reliability constrains the precision of gap estimates.

Covariates

Demographic and professional characteristics included age, gender, professional category (physician vs. nurse), years of ED experience, education level (bachelor’s or below vs. master’s or above), personal history of medical disputes (yes/no), and workplace violence exposure in the past year (yes/no).

Statistical Analysis

Descriptive statistics characterised the sample. Continuous variables are presented as mean (SD) or median (IQR) for skewed distributions; categorical variables as frequencies and percentages. Multivariable logistic regression examined associations between social media-derived fear (continuous, standardised per SD increase) and defensive behaviours, adjusting for all eight covariates. The primary model used conventional standard errors. Moderation by professional category was tested via an interaction term between mean-centred fear and professional category, followed by stratified analyses. Because the odds ratio is non-collapsible, stratified ORs and the interaction OR from the pooled model are not expected to coincide. With an events-per-variable ratio of approximately 6:1—below the recommended threshold of 10—these estimates may be unstable and should be interpreted cautiously. Cluster-robust standard errors accounting for the five hospitals were computed as a sensitivity check. Model diagnostics included the Hosmer-Lemeshow test, AUC, AIC, and VIF. The knowledge-practice gap was examined using contingency tables and McNemar’s test with continuity correction; Cohen’s kappa quantified agreement. The Cochran-Armitage trend test compared the conditional probability of exhibiting the gap (adequate knowledge but inconsistent practice) across fear tertiles. Because this analysis is conditional on adequate knowledge, tertiles were calculated only among participants who

met this threshold; the groups in Table 4 correspond to this subset. Defining tertiles on the full sample would have assigned knowledge-inadequate participants to fear strata that do not contribute to the conditional gap analysis, potentially distorting stratum-specific rates. Common method bias was assessed using Harman's single-factor test. All analyses were conducted in Stata 17.0 and R 4.3.0.

Results

Participant Characteristics

The analytic sample comprised 141 emergency medical staff: 59 physicians (41.8%) and 82 nurses (58.2%). Mean age was 33.6 years (SD = 5.5), with median ED experience of 7.0 years (IQR 4.0–11.0). Men comprised 49.6% of the sample. Most participants held a bachelor's degree or below (63.8%). Twenty-three participants (16.3%) reported a personal history of medical disputes, and 92 (65.2%) reported exposure to workplace violence in the past year (Table 1). Cross-hospital comparisons revealed no significant differences across the five institutions (all P > 0.10).

Table 1
Demographic and Professional Characteristics of Participants (N = 141)

Characteristic	Value	n (%) or Mean (SD)
Age, years	33.6 (5.5)	—
Gender (male)	70	(49.6)
Professional category		
Physician	59	(41.8)
Nurse	82	(58.2)
ED experience, years median (IQR)	7.0 (4.0–11.0)	
Education		
Bachelor's or below	90	(63.8)
Master's or above	51	(36.2)
Personal disputes history (yes)	23	(16.3)
Workplace violence exposure (yes)	92	(65.2)

Prevalence of Defensive Behaviours

Defensive behaviours were present in 35.5% (50/141) of participants. Physicians showed a higher prevalence than nurses (44.1% [26/59] vs. 29.3% [24/82]), though the difference did not reach statistical significance (unadjusted χ^2=3.28, P = 0.070; adjusted OR = 1.43, P = 0.490). Figure 1 shows the participant flow.

Descriptive Statistics of Key Constructs

Social media-derived fear scores ranged from 23 to 58 (mean 40.3, SD 7.5). DMS scores ranged from 12 to 37 (mean 22.7, SD 5.9, median 23.0, IQR 18–25) out of a possible range of 8 to 40. Knowledge scores ranged from 7 to 20 (mean 15.5, SD 3.0). Fear scores did not deviate substantially from normality (Shapiro-Wilk W = 0.989, P = 0.344).

Association Between Social Media-Derived Fear and Defensive Behaviours

Multivariable logistic regression (Table 2) showed that each one-standard-deviation increase in social media-derived fear was associated with higher odds of defensive behaviours (OR 2.16, 95% CI 1.41–3.31, P < 0.001). Personal history of medical disputes showed the strongest independent association (OR 6.41, 95% CI 2.18–18.88, P < 0.001). ED experience years showed an inverse association that reached significance only under cluster-robust standard errors (OR 0.87, 95% CI 0.81–0.94, P < 0.001; model-based P = 0.152). No other covariate reached statistical significance in the primary model.

Table 2
Multivariable Logistic Regression of Factors Associated with Defensive Behaviours (N = 141)

Variable	OR	95% CI	P-value
Social media-derived fear (per SD)	2.16	1.41–3.31	< 0.001**
Age (per year)	1.09	0.93–1.28	0.291
Gender (male)	0.87	0.37–2.03	0.745
Professional category (physician)	1.43	0.52–3.94	0.490
ED experience (per year)	0.87	0.72–1.05	0.152
Education (master's or above)	0.84	0.36–1.99	0.699
Personal disputes history (yes)	6.41	2.18–18.88	< 0.001**
Workplace violence exposure (yes)	0.53	0.23–1.21	0.132

Note: Model-based standard errors. Cluster-robust standard errors (5 hospital clusters) were computed as a sensitivity check; the fear OR remained 2.16 (95% CI 1.37–3.41, P < 0.001), while ED experience became significant (OR 0.87, 95% CI 0.81–0.94, P < 0.001). OR = odds ratio; CI = confidence interval.

Moderation by Professional Category

Stratified analyses suggested differential associations by professional category (Table 3, Fig. 3). Among physicians (n = 59, 26 events), each SD increase in fear was associated with substantially higher odds of defensive behaviours (OR 5.68, 95% CI 2.04–15.81, P = 0.001). Among nurses (n = 82, 24 events), the association was weaker and non-significant (OR 1.41, 95% CI 0.86–2.32, P = 0.178). The wide confidence interval for the physician estimate reflects the small number of events relative to predictors (EPV = 3.25).

In the pooled interaction model, the interaction term was statistically significant (OR 2.84, 95% CI 1.07–7.49, P = 0.035). Figure 2 shows the predicted probabilities: the divergence between physicians and nurses widens at higher fear levels.

Table 3
Stratified and Interaction Analyses by Professional Category

Analysis	OR	95% CI	P-value
Physicians (n = 59, 26 events)	5.68	2.04–15.81	0.001*
Nurses (n = 82, 24 events)	1.41	0.86–2.32	0.178
Interaction (Fear × Physician)	2.84	1.07–7.49	0.035*
Note: OR = odds ratio; CI = confidence interval. Stratified models adjusted for all covariates within each subgroup.			

Knowledge-Practice Gap

Of 141 participants, 138 had complete practice data. The knowledge-practice discrepancy was pronounced: 80.4% (111/138) demonstrated adequate knowledge, yet only 54.3% (75/138) reported consistent practice. McNemar's test confirmed a significant gap (χ^2=27.40, P < 0.001). Cohen's kappa was 0.30 (95% CI 0.16–0.44), indicating fair agreement beyond chance.

When stratified by fear tertiles calculated among the 111 participants with adequate knowledge, the conditional probability of a knowledge-practice gap (given adequate knowledge) increased from 26.8% (11/41) in the lowest tertile to 30.6% (11/36) in the intermediate and 55.9% (19/34) in the highest. Overall, 36.9% of knowledgeable participants showed a gap; this proportion more than doubled from the lowest to the highest fear tertile. The Cochran-Armitage trend test supported a significant linear trend (Z = 2.52, P = 0.012). Figure 4 illustrates the discordance between knowledge and practice and the widening gap across fear tertiles (tertile cut-points: low ≤ 37, intermediate 38–43, high ≥ 44). The modest reliability of the practice scale (α = 0.72) constrains the precision of these gap estimates.

Table 4
Knowledge-Practice Contingency Table (N = 138)

Adequate Knowledge	Consistent Practice	Inconsistent Practice	Total
	70 (50.7%)	**41 (29.7%)**	**111 (80.4%)**
Inadequate Knowledge	5 (3.6%)	22 (15.9%)	27 (19.6%)
Total	75 (54.3%)	63 (45.7%)	138 (100%)

Sensitivity Analysis of the Practice Threshold

To assess whether the choice of practice threshold influenced the findings, we repeated the gap analysis using alternative thresholds: ≥60% (≥ 3 of 5 scenarios), ≥ 70/80% (≥ 4 of 5), and ≥ 90% (5 of 5). As shown in Table 5, the knowledge-practice gap remained significant across all thresholds (McNemar P < 0.01 throughout), and the conditional probability of the gap among knowledgeable participants increased monotonically across fear tertiles at the 60% and 80% thresholds. The Cochran-Armitage trend test was significant at the 60% and 80% thresholds (P = 0.005 and P = 0.012, respectively); at the 90% threshold the trend was in the same direction but did not reach significance (P = 0.273), likely because the stringent bar for “consistent practice” compressed the gap rate across all tertiles. These results suggest that the association between fear and the knowledge-practice gap is not an artefact of the 80% threshold, though the strength of the trend varies with threshold stringency.

Table 5
Sensitivity Analysis of Knowledge-Practice Gap Across Alternative Practice Thresholds (N = 138)

Threshold	Consistent n (%)	Gap Rate (%)	McNemar P	Low Fear Gap (%)	Mid Fear Gap (%)	High Fear Gap (%)	Trend P
≥ 60% (≥ 3/5)	87 (63.0)	26.1	< 0.001**	12.2	27.8	41.2	0.005*
≥ 80% (≥ 4/5)	75 (54.3)	36.9	< 0.001**	26.8	30.6	55.9	0.012*
≥ 90% (5/5)	43 (31.2)	64.9	< 0.001**	65.9	50.0	79.4	0.273

Note: Gap rate calculated among 111 participants with adequate knowledge. Consistent n (%) calculated among all 138 participants.

Model Diagnostics

Discrimination of the regression model was adequate (AUC = 0.767), and calibration was acceptable (Hosmer-Lemeshow P = 0.230). Variance inflation factors ranged from 1.02 to 4.65; age and ED experience showed moderate collinearity (VIF 4.65 and 4.58, respectively), while all other VIFs were below 2.0. In Harman’s single-factor test, the first unrotated factor accounted for 15.1% of variance—well below the 50% threshold—suggesting that common method bias was unlikely to be a serious concern.

Discussion

Social media-derived fear of medical disputes was associated with defensive behaviours in acute pain management among the 141 emergency clinicians we surveyed. This association was not uniform: it appeared stronger among physicians than nurses, although the physician estimate was imprecise and may overstate the true effect. The knowledge-practice gap also widened with increasing fear—clinicians with adequate knowledge were less likely to report consistent practice as fear increased—suggesting that fear may impede the translation of knowledge into clinical action.

The association between fear and defensive behaviours is consistent with a growing literature on defensive medicine in China [4–8]. Our findings suggest that the digital information environment—specifically, exposure to medical dispute narratives on social media—may serve as a risk factor for defensive practice independent of direct personal experience.

Interpretation of Professional Category Differences

Caution is warranted in interpreting the moderation by professional category. The physician subgroup OR of 5.68 (95% CI 2.04–15.81) rests on only 26 events with 8 predictors (EPV = 3.25), yielding a confidence interval spanning nearly 8-fold. Sparse events render effect estimates vulnerable to inflation through sampling variability; an OR of this magnitude is likely an overestimate. The interaction P value (0.035), while nominally significant, is itself derived from limited data and should not be overinterpreted.

The ratio of the two stratified ORs (5.68/1.41 = 4.03) does not equal the interaction OR of 2.84 (95% CI: 1.07–7.49). The discrepancy is expected: the stratified ORs derive from separate logistic models fitted within each professional group, whereas the interaction OR comes from a single pooled model that includes all covariates and the product term simultaneously. Because the odds ratio is non-collapsible—a conditional OR given covariates need not equal the marginal OR—these two quantities are not expected to coincide, particularly in small samples with sparse events. Figure 2 presents the predicted probabilities from the interaction model, which may be easier to interpret than ORs alone.

The moderation finding should therefore be treated as hypothesis-generating rather than confirmatory. Sparse data can readily produce inflated effect sizes that would likely attenuate in a larger sample, and our analysis lacks the precision needed to distinguish genuine professional-category differences from sampling noise. Policy conclusions should not rest on this single underpowered subgroup comparison; replication with adequate power is essential.

Knowledge-Practice Gap

The knowledge-practice gap mirrors earlier reports from Chinese hospital settings, particularly among nurses [16, 17]. This gap, however, was not uniform: 36.9% of knowledgeable participants exhibited a gap, and the rate more than doubled from the lowest to the highest fear tertile (26.8% vs. 55.9%). Both the affect heuristic framework [13] and the attention-narrowing hypothesis [22] predict that heightened fear narrows attentional focus and biases decision-making toward self-preserving behaviours. Because the design is cross-sectional, no causal inference is warranted, and the modest reliability of the practice measure ($\alpha = 0.72$) constrains the precision of the gap estimates.

Practical Implications

Personal history of medical disputes showed the strongest independent association with defensive behaviours (OR 6.41), indicating that direct experience outweighs vicarious exposure through social media. Quality improvement programmes that address fear and defensive decision-making as barriers to

guideline implementation may therefore be warranted. Digital staff support interventions [21] have been proposed to help clinicians process fear associated with medical dispute narratives. Given the modest reliability of the practice measure, future work should employ more reliable instruments to estimate the knowledge-practice gap with greater precision.

Limitations

As a cross-sectional study, causality cannot be inferred. Our convenience sample of 141 clinicians from five tertiary hospitals limits generalisability, and the low events-per-variable ratio (~ 6:1) risks overfitting. Self-reported data introduce social desirability bias; the fear scale awaits external validation, and absent social media data, dose-response relationships remain unassessed. The DMS showed only acceptable internal consistency ($\alpha = 0.75$) in our sample, and whether the physician-derived DMS captures nurses' defensive behaviours is unclear. Moderate multicollinearity between age and ED experience (VIF ~ 4.6) may inflate standard errors for these predictors. The median split (> 23) produced an imbalanced grouping (35.5% vs 64.5%), reducing statistical power; the effective loss in power relative to a balanced split is modest (approximately 10–15%), and the bias is conservative (toward the null), but the imbalance should be borne in mind when interpreting the strength of associations. The 80% practice threshold was pre-specified; sensitivity analyses across 60–90% confirmed robustness, with stronger trends at more stringent cut-offs.

Conclusion

Social media-derived fear of medical disputes was associated with defensive behaviours in acute pain management among emergency clinicians. Whether the association genuinely differs between physicians and nurses remains uncertain, given the imprecise subgroup estimates and low events-per-variable ratio. The knowledge-practice gap was both substantial and fear-dependent: clinicians with greater fear were less likely to translate adequate knowledge into consistent practice. Longitudinal data are needed to establish temporal ordering and support causal inference.

Declarations

Ethics approval and consent to participate: The Institutional Review Board of Guangyuan Central Hospital approved the protocol (approval number: GYZXLL2026007). Participants provided electronic informed consent.

Consent for publication: Not applicable.

Availability of data and materials: The de-identified dataset and analysis code are available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests.

Funding: This research received no specific grant from any funding agency.

Authors' contributions: LHB, LHY and CMS conceived the study, collected data, and performed statistical analyses. XLZ contributed to data interpretation. ZYL and SZ supervised the study and revised the manuscript. All authors read and approved the final manuscript.

References

1. Studdert DM, Mello MM, Sage WM, et al. Defensive medicine among high-risk specialist physicians in a volatile malpractice environment. JAMA. 2005;293(21):2609-2617.
2. Siddiqui A, Belland L, Rivera-Reyes L. A multicenter evaluation of emergency department pain care across different types of fractures. Pain Med. 2017;18(3):535-545.
3. Hachimi-Idrissi S, Coffey F, Hautz WE, et al. Approaching acute pain in emergency settings: European Society for Emergency Medicine guidelines. Intern Emerg Med. 2020;15(7):1125-1139.
4. Ortashi O, Virdee J, Hassan R. The practice of defensive medicine among hospital doctors in the United Kingdom. BMC Med Ethics. 2013;14:42.
5. Jin B, Liang LJ, Xu CX, et al. Physician experiences and perceptions of patient-initiated recording in emergency departments. BMC Med Ethics. 2026;27(1):91.
6. Zhang X, Sleeboom-Faulkner M. Tensions between medical professionals and patients in mainland China. Camb Q Healthc Ethics. 2011;20(3):458-465.
7. He AJ. The doctor-patient relationship, defensive medicine and overprescription in Chinese public hospitals. Soc Sci Med. 2014;123:64-71.
8. Sun T, Wang J, Zhang S, et al. Status, causes and consequences of physicians' self-perceived professional reputation damage in China. BMC Health Serv Res. 2021;21(1):344.
9. Gong W, Guo Q. Framing public opinion on physician-patient conflicts on microblog. Front Public Health. 2022;10:831638.
10. Zheng Y, Tian M, Chen J, et al. Public attitudes toward violence against doctors: sentiment analysis of Chinese users on Sina Weibo. JMIR Med Inform. 2025;13(1):e63772.
11. Hobfoll SE. Conservation of resources: a new attempt at conceptualizing stress. Am Psychol. 1989;44(3):513-520.
12. Cropanzano R, Mitchell MS. Social exchange theory: an interdisciplinary review. J Manage. 2005;31(6):874-900.
13. Slovic P, Peters E, Finucane ML, MacGregor DG. Affect, risk, and decision making. Health Psychol. 2005;24(4S):S35-S40.
14. Cabana MD, Rand CS, Powe NR, et al. Why don't physicians follow clinical practice guidelines? JAMA. 1999;282(15):1458-1465.
15. Grol R, Grimshaw J. From best evidence to best practice. Lancet. 2003;362(9391):1225-1230.
16. Li Y, Huang K, Cheng Y, et al. Pain management by nurses in level 2 and level 3 hospitals in China. Pain Manag Nurs. 2019;20(3):284-291.

17. Wang J, Zhang Y, Bi S, et al. Factors related to nurses' knowledge and attitudes towards pain management. BMJ Open. 2025;15(5):e097514.
18. Katz DA, Williams GC, Brown RL, et al. Emergency physicians' fear of malpractice in evaluating patients with possible acute cardiac ischemia. Ann Emerg Med. 2005;46(6):525-533.
19. Fan Z, Shi X, Xu M, Wen H. The Chinese version of Defensive Medicine Scale (DMS): reliability and validity test. BMC Psychol. 2024;12(1):462.
20. Chinese Society of Emergency Medicine. Chinese expert consensus on analgesia, sedation, and delirium management for adults in emergency care. Chin J Emerg Med. 2023;32(12):1594-1609.
21. Delgadillo J, Laker V, Simmonds-Buckley M, et al. Digital health interventions for occupational burnout in healthcare professionals: a multi-site randomised non-inferiority trial. Behav Res Ther. 2025;195:104919. doi:10.1016/j.brat.2025.104919
22. Easterbrook JA. The effect of emotion on cue utilization and the organization of behavior. Psychol Rev. 1959;66(3):183-201.

Figures

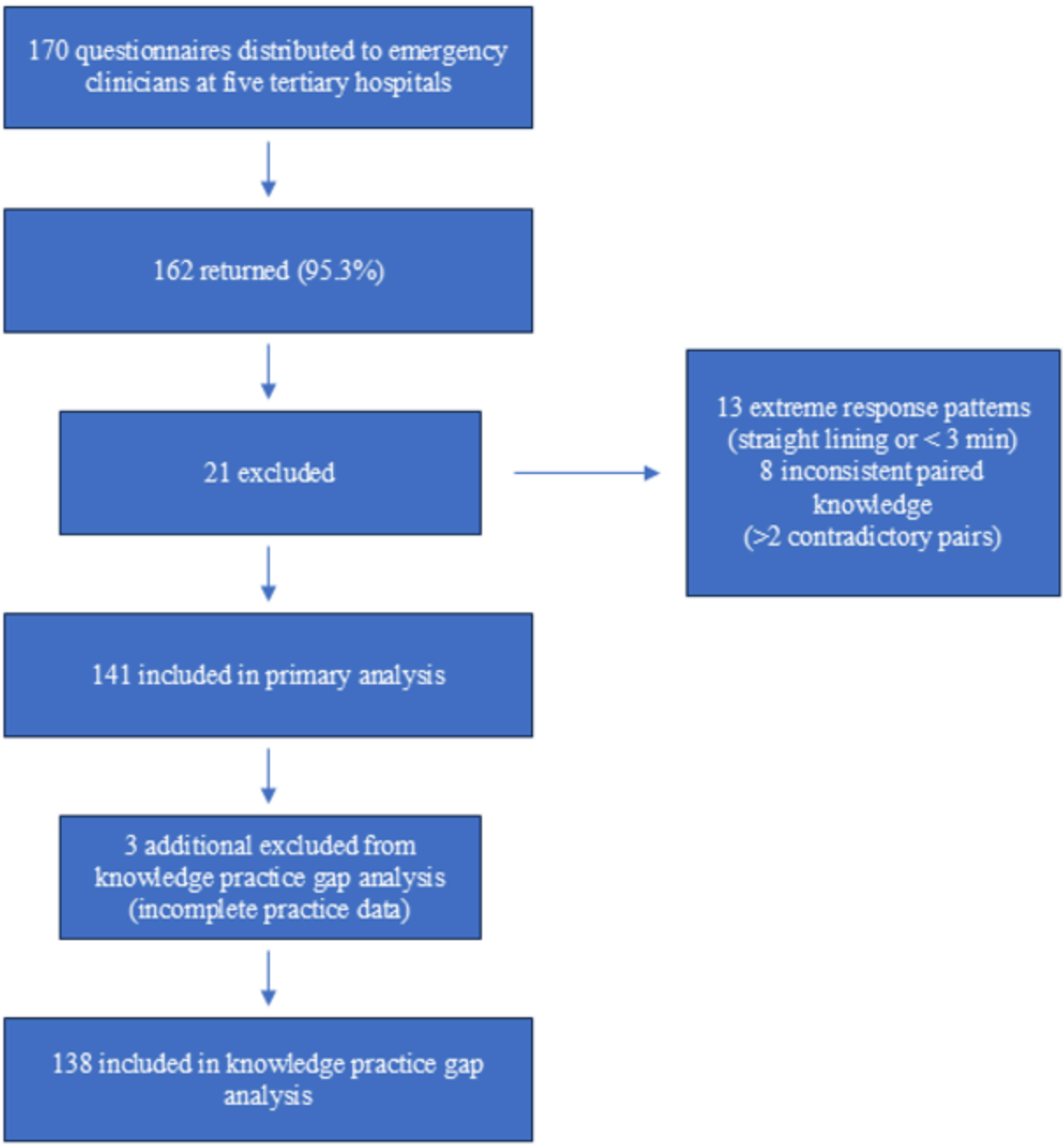


Figure 1

Participant flow diagram.

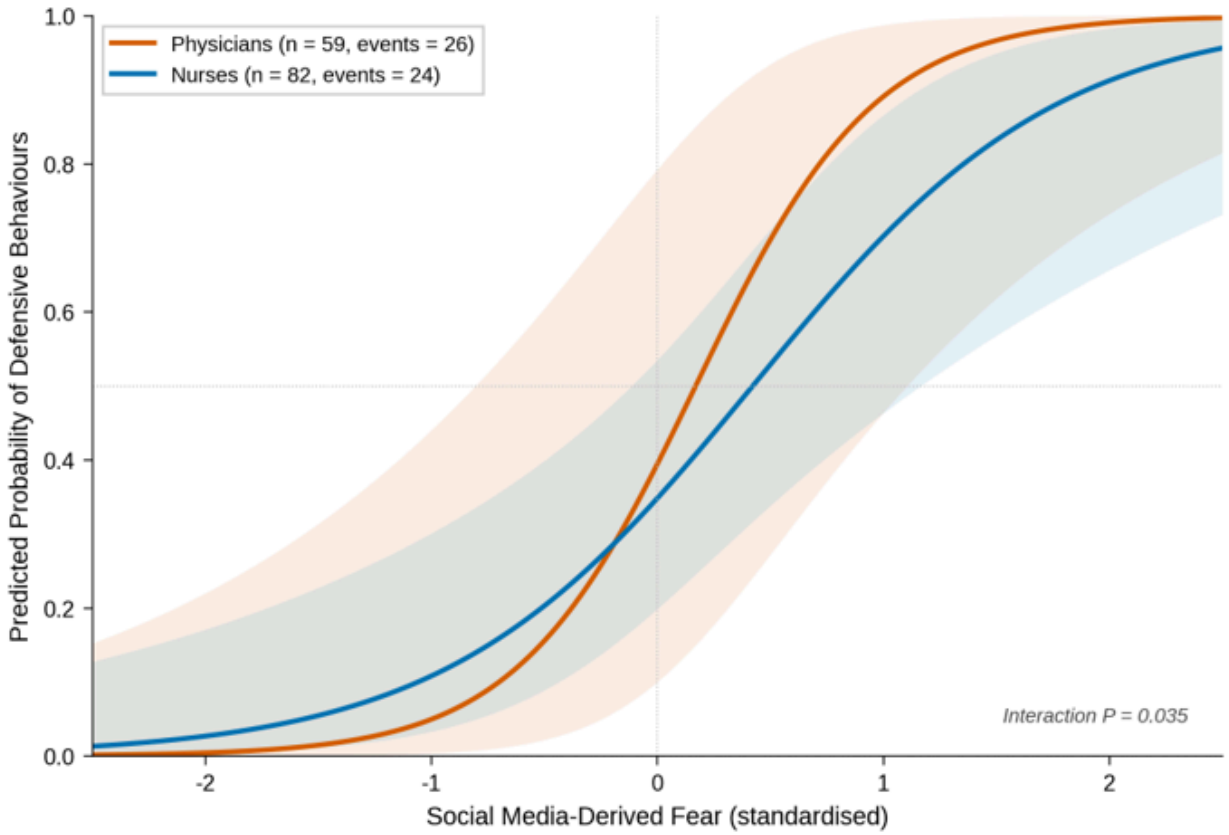


Figure 2

Predicted probability of defensive behaviours across standardised fear levels by professional category, derived from the logistic interaction model. Shaded areas represent 95% confidence bands based on the delta method.

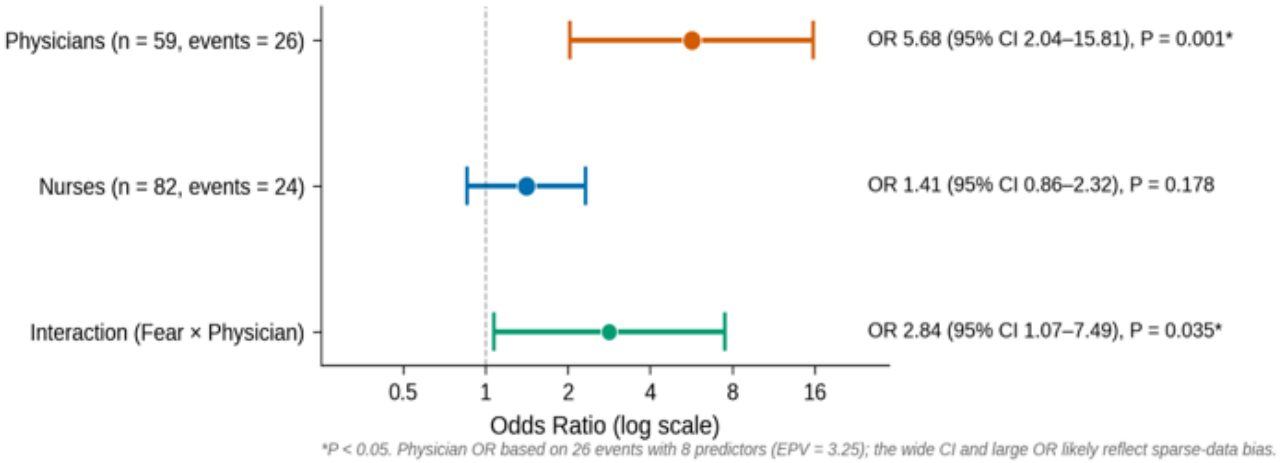


Figure 3

Forest plot of the association between social media-derived fear and defensive behaviours by professional category. *P < 0.05. Note: Physician estimate based on 26 events with 8 predictors (EPV=3.25); CI is wide and the OR is likely inflated.

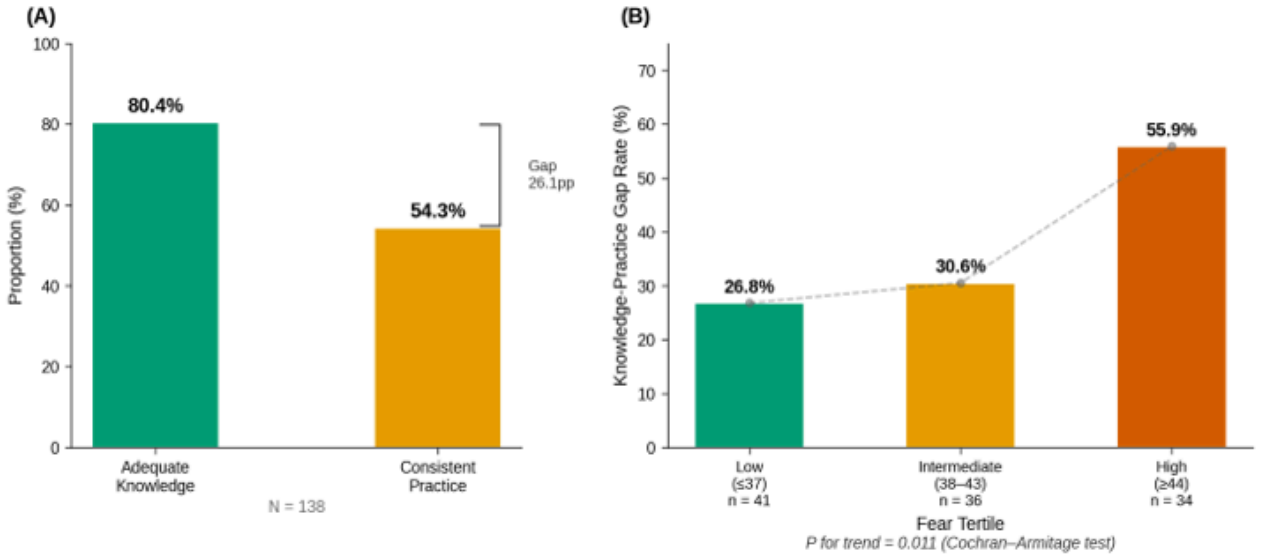


Figure 4

Knowledge-practice gap. (A) Proportion with adequate knowledge versus consistent practice (N=138). (B) Knowledge-practice gap rate across fear tertiles among participants with adequate knowledge (n=111; P for trend = 0.012, Cochran–Armitage test).