

Injury disclosure timing, media framing, and audience emotional responses to sports events: an empirical content analysis of Weibo during the Milano Cortina 2026 Winter Olympics

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Abstract. Athlete injuries have gradually become a major topic of public concern and discussion on social media. This study investigates athlete injury-related incidents on Weibo throughout the entire communication cycle of the 2026 Milano Cortina Winter Olympic Games. Drawing on framing theory and the Circumplex Model of Affect, the study explores how injury disclosure timing and media framing jointly shape audience emotional responses. Focusing on Weibo, the research sample consists of influential verified accounts with strong agenda-setting capacity. It analyzed reports and comments regarding the injuries of six athletes during the Winter Olympics. The results indicate that both injury disclosure timing and media framing exert significant effects on audience emotional expression, with media framing serving as a key moderating variable between disclosure timing and public emotion. Injury disclosure during competitions tends to evoke low-arousal negative emotions. The resilience frame is more likely to evoke positive emotions, while the health frame is more likely to evoke negative-valence emotions. This study verifies that the combined effect of injury disclosure timing and media framing shapes public emotional reactions to athlete injuries. This paper provides empirical evidence and strategic guidance for sports media to optimize injury reporting and enhance communication effectiveness.

Keywords: Weibo, injury disclosure timing, media framing, Circumplex Model of Affect, audience emotional response

1. Introduction

In a highly professionalized and commercialized sports environment, athletes face greater physical strain and competitive pressure while pushing the limits of the human body, making injuries an increasingly significant topic in sports events coverage and public discourse [1]. With the development of the internet and social media, the dissemination of sports events information has gradually shifted from being dominated by traditional media to involving multiple stakeholders, forming a new landscape in which media organizations, sports Key Opinion Leaders (KOLs), and ordinary users jointly participate in disseminating injury

information. As a major global winter sports event, the 2026 Milano Cortina Winter Olympics (hereinafter referred to as the Winter Olympics) has attracted widespread attention from the media and the public.

During the match, information regarding athletes' injuries was widely disseminated through media reports and social media platforms, generating extensive public discussion and emotional expressions in the comment sections of platforms like Weibo. Compared to traditional sports news reporting, the dissemination of injury information in the social media context is characterized by immediacy, high interactivity, and pronounced emotional expression. Against this backdrop, both the timing of injury disclosure and media framing may exert different influences on audience emotional responses. However, existing research has not yet examined the interactive effects of the two variables, injury disclosure timing and media framing.

Accordingly, this study employs purposive sampling to select reports on the injuries of six athletes, along with related comments posted by influential Weibo users, as the sample for analysis. By constructing a two-factor analytical framework that examines injury disclosure timing and media framing, the study investigates the impact of these variables on the emotions of sport event audiences. This study offers sports media guidance on balancing competitive narratives with humanistic care when reporting on athlete injuries. It provides empirical guidance for optimizing sports news dissemination strategies and fostering rational public discourse.

2. Literature review

2.1. Media framing theory

Framing theory was originally defined as a cognitive structure through which individuals organize social experiences; it has since become a communication studies paradigm for explaining how media narratives shape public perception [2]. Entman further elaborated on this as a process of selection and salience, noting that when presenting social events, the media often selectively highlights or downplays certain informational elements, thereby guiding audiences to form specific pathways of understanding [3]. This perspective provides a key tool for this study's exploration of the meaning-making in sports injury reporting: while the injury itself is an objective event, media coverage, as a form of information processing, influences the emotional attitudes of the audience.

Currently, framing theory has been widely applied in research on sports injury reporting. Xinyu Gao argues that the media constructs injury narratives primarily through three dimensions: thematic, structural, and discursive frames. Although the reporting as a whole tends to be relatively objective and neutral, issues such as excessive focus on match outcomes, a lack of humanistic care, and insufficient depth of commentary still exist [4]. Previous research on injury coverage of National Football League (NFL) quarterbacks identified two types of frames: "supporting the athlete" and "attributing blame to the team," reflecting a narrative division based on the assignment of responsibility and further indicating a gradual shift in media reporting toward a "health-first" value orientation [5]. Additionally, Schwartz further confirmed that "serious" frame and a "less serious" concussion reporting frames significantly influence audiences' perceptions of injury severity [6].

In summary, existing research has explored the classification of injury narrative frames and their impact on public perception, but has rarely delved into the intrinsic relationship between the two, particularly lacking an examination of the interaction between injury disclosure timing and media framing.

2.2. The circumplex model of affect

Russell's Circumplex Model of Affect provides a new theoretical framework for measuring the emotional responses of sports audiences. Its core premise holds that emotions are not discrete, mutually exclusive

categories, but are distributed within a two-dimensional space defined by the dimensions of "valence" and "arousal" [7]. Here, valence reflects the positive or negative pleasantness of an emotional experience, while arousal indicates the level of emotional activation. Different emotions form a continuous distribution within this two-dimensional space and further manifest in four typical structures: high-arousal positive valence, high-arousal negative valence, low-arousal positive valence, and low-arousal negative valence.

In recent years, the Circumplex Model of Affect has been widely applied in sports communication. For example, research by Uhrich and Benkenstein indicates that key events in sports competitions elicit strong emotional responses among spectators, with wins evoking high-arousal positive emotions and losses evoking negative emotions such as anger and frustration [8]. Existing research has also combined the Circumplex Model of Affect with large-scale online data analysis to conduct sentiment analysis of social media text [9]. Empirical results show that athlete performance, the course of the event, and the match outcome all significantly influence the intensity and direction of audience emotional expression, providing a theoretical basis for this study's examination of injury disclosure timing on audience emotions.

3. Research hypotheses

Sports event communication exhibits distinct temporal and situational dependencies. Existing research indicates that key events during a match often significantly elevate viewers' emotional arousal levels [10]. The timing of athlete injury information is typically embedded within specific event narrative structures, and this timing may alter audiences' cognitive evaluations of the event, thereby influencing emotional expression. Based on this, this study proposes the following research hypotheses:

H1: Injury Disclosure Timing significantly influences the distribution of audience emotional types.

H1a: Injury Disclosure Timing during the match elicits higher arousal levels than disclosure before or after the match.

H1b: Injury Disclosure Timing after the match is more likely to generate low-arousal negative emotions.

H1c: Injury Disclosure Timing after the match is more likely to generate low-arousal positive emotions.

In addition to injury disclosure timing, the narrative framework adopted by media framing also influences audience emotional responses. In sports injury communication, a common narrative is the health frame, which centers on health status and risk assessment, emphasizing injury risks, medical advice, and prioritizing health. When communication content highlights potential threats and health risks, it is more likely to activate risk-assessment emotions such as caution, concern, or sympathy [11].

Meanwhile, the resilience frame focuses on fighting spirit and willpower. This narrative style typically highlights scenarios such as athletes persevering despite injuries, overcoming difficulties, or tenaciously competing, emphasizing individual struggle and persistence in the face of adversity. The psychological concept of resilience emphasizes an individual's ability to maintain or restore functioning under stress or adversity. In sports narratives, this concept is often combined with heroic portrayals, thereby forming inspirational story patterns that readily evoke high-arousal emotional responses such as admiration, elation, or emotional resonance [12, 13]. Accordingly, this study further proposes the following research hypotheses:

H2: The type of media framing adopted in posts on Weibo will significantly influence the distribution of audience emotions.

H2a: Compared to the resilience frame, the health frame is more likely to elicit negative-valence emotions.

H2b: Compared to the health frame, the resilience frame is more likely to elicit positive-valence emotions.

4. Research design

4.1. Selection of samples

4.1.1. Selection of injury event samples

This study selected injury-related communication events from the Winter Olympics communication cycle (including pre-event hype and post-event summaries) for analysis. Selection criteria included that the injury disclosure event occurred within the Winter Olympics communication cycle and had a clearly defined injury disclosure timing, that the event generated significant discussion on the Weibo platform, and that the athlete possessed a certain level of influence and public attention.

To ensure the statistical robustness of the research conclusions and to control for interference from individual athlete differences, this study adopted a multi-case study design during the screening phase. Specifically, two typical cases were selected for each disclosure timing. Additionally, to account for differences across dimensions such as sport discipline, fan base size, and public image, the study ultimately selected injury disclosure events involving six athletes: Eileen Gu, Lim Hyo-jun, Liu Jiayu, Sun Long, Sui Wenjing, and Fan Kexin, as research cases, thereby minimizing the interference of individual athlete characteristics.

4.1.2. Selection of post samples

This study employed the Weibo platform as its data source, retrieving posts related to athletes' injuries through keyword searches. For each injury incident, the top 3–5 comment-based posts with the highest engagement were selected for analysis. Sample accounts were restricted to verified accounts on the Weibo platform that possess public influence and agenda-setting power. These included official accounts of mainstream media, sports-focused media outlets, accounts of well-known sports commentators, sports-related KOLs, and prominent self-media accounts (with more than 500,000 followers). To prevent a single source from unduly influencing the analysis results, this study established a screening rule limiting each account to a maximum of three to five top-engagement posts per incident.

4.1.3. Selection of comment samples

Since the number of comments varied significantly across different posts, this study randomly selected the first 4–8 valid comments from each post based on the number of comments it received. The exclusion criteria were as follows: marketing or spam comments unrelated to the topic of injuries or illnesses; posts consisting solely of emojis or punctuation; and highly repetitive comments. The final sample size of valid comments was 205.

4.2. Variable design

4.2.1. Determination of injury disclosure timing

The first independent variable is injury disclosure timing. This is categorized based on the timing of information disclosure regarding injury or illness incidents. Injury disclosure before the match is coded as 1. Injury disclosure during the match is coded as 2. Injury disclosure after the match is coded as 3.

4.2.2. Media framing classification

The second independent variable is media framing, which is divided into two categories: the health frame (coded as 1) and the resilience frame (coded as 2).

Some posts incorporate elements of both frames. This study adopts the dominant narrative logic principle. For samples where classification was ambiguous, experts were consulted to determine the dominant frame. In this paper, samples are ultimately classified based on their dominant frame.

4.2.3. Audience emotion classification

The dependent variable in this study is audience emotional type. Based on the Circumplex Model of Affect, and considering the content and intensity of the comments, this study classified the comments into four categories.

High-Arousal Positive Valence (code 1): Manifested as excitement, enthusiasm, strong support, etc. For example: "Go for it, you're the best!"

High-Arousal Negative Valence (code 2): Manifested as anger, anxiety, strong dissatisfaction, etc. For example: "That's so irresponsible!"

Low-Arousal Negative Valence (code 3): Manifested as sympathy, regret, sadness, or disappointment. For example: "What a pity."

Low-Arousal Positive Valence (code 4): Manifested as calm well-wishes, understanding, and comfort. For example: "Get well soon."

4.3. Coding and reliability testing

During the coding process, the researchers developed a detailed coding manual that clearly defined the operational definitions and criteria for each variable. Two coders independently coded 20% of the sample, and Cohen's Kappa coefficient was calculated to assess reliability. In this study, Cohen's Kappa was 0.82, indicating excellent coding consistency. After reliability was established, coding of the entire sample was completed.

4.4. Data analysis methods

Since both the independent and dependent variables in this study are categorical, this study adopted the chi-square test as the primary data analysis method to examine the associations and statistical significance among the variables. Additionally, a stratified chi-square test was conducted to examine the moderating effects of injury disclosure timing and audience emotional responses under different frameworks. Statistical significance was set at $p < 0.05$. Prior to formal testing, the sample frequency distribution was examined to ensure that the data met the conditions for the chi-square test.

5. Results

5.1. Descriptive statistics

A total of 205 valid comments were collected for this study, as shown in Table 1. In terms of injury disclosure timing: the sample included 62 comments before the match, 64 comments during the match, and 79 comments after the match. In terms of media framing: 74 comments (36.1%) were classified under the health frame and 131 comments (63.9%) under the resilience frame. The overall distribution of the four emotion categories is presented in Table 1. Low-Arousal Negative Valence emotion was the most prominent, accounting for 40.5%. This indicates that in the context of sports injury reporting, the audience's predominant emotional response is empathetic concern rather than the expression of intense emotions.

Table 1. Overall distribution of the four emotional categories

Emotion Type	Valid Sample Size (Entries)	Percentage (%)
High-Arousal Positive Valence	59	28.8
High-Arousal Negative Valence	40	19.5
Low-Arousal Negative Valence	83	40.5
Low-Arousal Positive Valence	23	11.2
Total	205	100.0

5.2. The relationship between injury disclosure timing and audience emotion type

A chi-square test was conducted to examine the relationship between injury disclosure timing and audience emotion type. The results showed a significant association between the two ($\chi^2 = 38.80$, $df = 6$, $p < 0.001$), providing overall support for H1.

In terms of specific distributions, different injury disclosure timings exhibited distinct patterns of emotional expression. As shown in Table 2, among injury disclosures made during the match, Low-Arousal Negative Valence accounted for the highest proportion (59.4%). Thus, H1a was not supported.

In post-match disclosures, Low-Arousal Negative Valence accounted for the lowest proportion rather than the highest (34.2%), and H1c was not supported. The study found that pre-match disclosures were dominated by positive-valence emotions (58.0%), while post-match disclosures were dominated by high-arousal emotions (60.8%).

Table 2. Distribution of emotional types across different injury disclosure timings

Disclosure Timing	High-Arousal Positive Valence	High-Arousal Negative Valence	Low-Arousal Negative Valence	Low-Arousal Positive Valence
Pre-match Disclosure	32.3%	12.9%	29.0%	25.8%
Disclosure during the Match	10.9%	25.0%	59.4%	4.7%
Post-match Disclosure	40.5%	20.3%	34.2%	5.0%

5.3. The effect of media framing on audience emotional sentiment

The chi-square test results for the relationship between media framing and emotional types were also significant ($\chi^2 = 50.46$, $df = 3$, $p < 0.001$), confirming Hypothesis H2 (as shown in Table 3).

Table 3. Distribution of emotional types under different media frames

Framework	High-Arousal Positive Valence	High-Arousal Negative Valence	Low-Arousal Negative Valence	Low-Arousal Positive Valence
Health Frame ($n = 74$)	6.8%	41.9%	43.2%	8.1%
Resilience Frame ($n = 131$)	41.2%	6.9%	38.9%	13.0%

5.4. Analysis of the moderating effect of media framing

The relationship between injury disclosure timing and emotion type was tested separately under different media framing conditions. Under the health frame, chi-square test results indicated that the relationship between injury disclosure timing and emotion type did not reach statistical significance ($\chi^2 = 10.52$, $df = 6$, $p = 0.104$). This result suggests that within the narrative context of the health frame, the differences in emotional distribution elicited by different injury disclosure timings are relatively limited (as shown in Table 4).

Table 4. Distribution of emotional types under different injury disclosure timings in the health frame

Disclosure Timing	High-Arousal Positive Valence	High-Arousal Negative Valence	Low-Arousal Negative Valence	Low-Arousal Positive Valence
Pre-match Disclosure	6.3%	50.0%	25.0%	18.8%
Disclosure during the Match	0.0%	37.9%	58.6%	3.5%
Post-match Disclosure	13.8%	41.4%	37.9%	6.9%

Under the resilience frame, there was a significant association between injury disclosure timing and emotion type ($\chi^2 = 30.80$, $df = 6$, $p < 0.001$). Further examination of the emotion distribution reveals that pre-match and post-match disclosures are more likely to elicit high-arousal positive emotions, whereas disclosures during the match were predominantly characterized by low-arousal negative valence emotions (as shown in Table 5).

Table 5. Distribution of emotional types by different disclosure timings under the resilience frame

Disclosure Timing	High-Arousal Positive Valence	High-Arousal Negative Valence	Low-Arousal Negative Valence	Low-Arousal Positive Valence
Pre-match Disclosure	41.3%	0.0%	30.4%	28.3%
Disclosure during the Match	20.0%	14.3%	60.0%	5.7%
Post-match Disclosure	56.0%	8.0%	32.0%	4.0%

6. Discussion

6.1. Analysis and interpretation

6.1.1. Emotional effects of disclosure timing

This study found that injury disclosure timing influences the audience's emotional perception. Specifically, there was a significant difference in emotional distribution between pre-match disclosures and disclosures during the match. For instance, the difference in high-arousal positive emotions between these two timings was 21.4%.

Several factors may explain this pattern. First, since the competition has not yet begun, audiences tend to believe that athletes can overcome injuries and complete the competition. This makes them more likely to express supportive and encouraging emotions. Faced with an upcoming competition, audiences tend to downplay the impact of injury incidents on athletic performance. Consequently, they tend to overlook the obstacles posed by injuries to performance and express positive emotions such as praise and anticipation.

However, disclosures during the match are often accompanied by visually striking live broadcast footage, allowing audiences to intuitively perceive the athlete's pain and vulnerability. Consequently, they are more likely to experience low-arousal negative emotions such as sympathy and regret.

During post-match disclosures, audiences not only perceive the distress caused by the injury but also attribute it to various responsible parties. Additionally, they synthesize the competitive outcome to generate positive emotions such as admiration, resulting in a complex and multifaceted psychological response overall.

6.1.2. Emotional shaping by media framing

Media framing not only directly influences audience emotions but also modulates the emotional effects of situational variables (such as injury disclosure timing) to a certain extent. Research has found that health frames centered on health risks are more likely to evoke negative emotions. This stems from the fact that such narratives emphasize the severity of injuries, potential risks, and the uncertainty of recovery, leading audiences to interpret the information primarily from the perspective of a health threat and generate emotional responses such as worry, pity, or sympathy.

In contrast, the resilience frame, centered on persevering despite injury, transforms injury incidents into a narrative resource of struggle and perseverance by highlighting athletes' overcoming of adversity. This enables audiences to interpret events more readily from the perspective of spiritual qualities, thereby evoking positive emotions such as admiration, encouragement, and support. Furthermore, the sample distribution indicates that the resilience frame accounts for a higher proportion of sports injury coverage, reflecting the current trend in sports content production toward inspirational narratives and the expression of positive emotions.

6.1.3. Moderating effects of media frames

Further analysis indicates that, within the health frame, audiences are more inclined to view injuries as health issues requiring attention. Negative emotions dominate throughout the disclosure timing cycle (accounting for 85.1% of the total), and the impact of injury disclosure timing is relatively attenuated.

In contrast, under the resilience frame, the role of injury disclosure timing in shaping emotions is more pronounced. Pre-match and post-match disclosures are more likely to be interpreted as inspirational narratives of athletes persevering through injury, thereby eliciting high-arousal positive emotions (accounting for 41.3% and 56.0%, respectively). In contrast, disclosures during the match are directly linked to athletic performance, leading audiences to perceive them as a disruption to competitive readiness and thus generating low-arousal negative emotions such as concern and regret (accounting for 60.0%). This indicates that, in the context of social media, the emotional effects of injury information are not determined solely by the event itself or the timing of the disclosure, but rather result from the combined influence of media framing and the informational context.

6.2. Implications for practice

First, media outlets should carefully consider injury disclosure timing during event broadcasts. Compared to post-match disclosures, pre-match disclosures are more likely to evoke positive-valence emotions among audiences. Post-match disclosures, when combined with competitive results, tend to trigger discussions about assigning blame, which can easily lead to high-arousal negative emotions and public opinion risks. Therefore, pre-match disclosure of injury status is preferable.

Second, regarding narrative approaches, the media can attempt to combine elements of the health frame and resilience frame to form a hybrid frame. This helps avoid overly heroic narratives of competing despite injury or solely pursuing positive audience feedback, which may reinforce the cultural pressure to "persevere through injury." Finally, media organizations and sports KOLs should exercise greater caution in selecting injury disclosure timing and constructing narrative frameworks. Balanced reporting can help foster a rational and caring public discourse in sports.

6.3. Limitations

This study is limited to the Weibo platform, and the sample size is relatively small, which may not fully represent the characteristics of emotional expression on social media. Audience emotional expression may also be influenced by factors such as the athlete's personal fame, the popularity of the sport, and fan base composition. Furthermore, since emotion classification relied on manual coding, subjective bias may still exist despite reliability testing.

7. Conclusion

This study examines the mechanisms by which injury disclosure timing and media framing influence public responses regarding athlete injury incidents during the communication cycle of the Winter Olympics. Drawing on social media data from Weibo, the research conducts an in-depth analysis of the relationships among variables in injury-related communication. The results indicate that injury disclosure timing significantly influences audience emotional distribution. Disclosures during the match are more likely to trigger low-arousal negative empathetic emotional responses. Media framing plays a distinct role in emotional guidance. The health frame tends to evoke negative-valence emotions, while the resilience frame tends to evoke positive emotions. Furthermore, media framing moderates the relationship between disclosure timing and emotions, with the effect of timing being more pronounced under the resilience frame.

This study has certain limitations, including a small sample size and focus on a single platform (Weibo). The influence of athletes' individual characteristics was also not controlled for. Future research could employ experimental methods to further validate the causal mechanisms. This study provides empirical evidence for sports media to optimize injury reporting, balance competitive narratives with humanistic care, and foster a rational sports public discourse environment.

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