Content Feature of Medical Crowdfunding Information in Social Media—A Content and Effectiveness Analysis of Medical Crowdfunding Posts on Sina Weibo in China

Yingying Cai[1], Syafila Kamarudin[2], Saiful Nujaimi[1], Xiaoyu Jiang[1], Xin Zhang[1]

[1]Department of Communication, Universiti Putra Malaysia, Serdang, Malaysia

[2]Institute for Social Science Studies, Universiti Putra Malaysia, Serdang, Malaysia

Correspondence: Syafila Kamarudin, Institute for Social Science Studies, Universiti Putra Malaysia, 43400 UPM Serdang, Malaysia.

Abstract

Attracting donations is challenging but imperative for fundraisers to secure donations. Solicitation narratives serve as a key strategy for attracting both acquaintances and strangers, thereby influencing donation behavior. To optimize medical crowdfunding messaging on social media, this study explores prevalent content features of medical crowdfunding messages on Sina Weibo and determines whether these features impact message effectiveness. A retrospective content analysis was conducted on medical crowdfunding posts on Sina Weibo in China throughout 2023. The posts were systematically coded for the author's gender, author type, target audience, key themes, human imagery, message sentiments, and message strategies, with their effectiveness analyzed using SPSS. Out of the 394 posts analyzed, private authors emerged as the dominant voices, directing their appeals predominantly toward the general public and often expressing neutral to negative sentiments. The overarching theme across these posts centered on the dire need for medical assistance. Including human imagery and informative message strategies was pivotal in determining post-effectiveness, eliciting heightened audience engagement in terms of likes and shares. Negative sentiment posts influenced comment effectiveness. These findings underscore the potential of social media campaigns in promoting altruistic health behaviors while emphasizing the critical role of strategic message design through the use of human imagery, informative message strategies, and negative sentiment to improve audience engagement.

Keywords: Medical crowdfunding; Social media; Message effectiveness; Emotional contagion theory; Content analysis; Sina Weibo

1. Introduction

Progress toward achieving universal healthcare worldwide has stalled, leaving more than half of the global population without access to basic health services (World Health Organization & World Bank Group, 2023). An estimated 1.3 billion people are forced into extreme debt due to high out-of-pocket health spending (PAHO, 2023). While insurance can reduce out-of-pocket expenses, the financial burden remains heavy on households with multiple seriously ill members (Snyder et al., 2020). Many individuals launch online appeals to reach the general public and gradually garner financial support by leveraging their social networks (Kenworthy, 2019). However, attracting donations in the competitive crowdfunding landscape is challenging (Raab et al., 2020), with many campaigns receiving insufficient financial support (Jin, 2019), highlighting the need for a better understanding of how to effectively frame project presentations.

Social media platforms provide the basis for promoting prosocial behaviors (Cai et al., 2021). The use of social media for healthcare crowdfunding is becoming increasingly common, generating significant funds from online donations (Huang et al., 2021). Sina Weibo, one of the largest social media platforms in China, embeds a charitable crowdfunding section that covers a wide range of projects, including medical needs, educational assistance, and environmental protection, enabling users to post, share, and comment on these crowdfunding projects (Li et al., 2022). Sina Weibo also encourages users to forward posts from other medical crowdfunding platforms to enhance project visibility. Fundraisers typically provide basic textual information about their projects and include images related to medical diagnoses and

patient conditions to clarify the purpose of fundraising. Netizens can express their attitudes, thoughts, or opinions on posts by clicking the "like" option, commenting, and sharing them within their networks.

Online crowdfunding relies heavily on individual projects and textual presentations for soliciting donations and attracting both acquaintances and strangers (Burtch & Chan, 2019; Chen et al., 2019; Mollick, 2014; Zhou & Ye, 2019). Prospective donors often review project stories before deciding to contribute, making the wording of solicitation requests, particularly project descriptions, crucial for attracting donations (Majumdar & Bose, 2018). Solicitation narratives thus serve as a key strategy for influencing donation behavior, as donors often base their decisions on emotional responses to the stories presented (Wong & Yang, 2021). However, fundraisers' efforts to convey the need for financial assistance often fail to align with the perceptions and expectations of contributors. While fundraisers feel compelled to depict their situation as desperate and urgent to warrant economic assistance, donors are typically moved by the contrast between the individual's prior positive state and the suffering caused by illness (Kim et al., 2018). Although narrative strategies have been analyzed in medical crowdfunding campaign outcomes, further exploration is needed to understand how and why specific narrative strategies influence these outcomes (Zheng & Jiang, 2022).

Emotions are a key driver of the spread of help posts (Chen et al., 2022; Karmegam & Mapillairaju, 2020; Luo et al., 2020) but long-term research on specific forms, like video, images and text, of persuasion has not produced consistent results (Xu, 2018). Studies show different results of various emotions on the performance of medical crowdfunding. Negative emotions like sadness, anxiety, and fear are prevalent, which can influence potential donors' decisions (Ge et al., 2023; Jang & Chu, 2022; Kramer et al., 2014), while Yang et al. (2023) advocated for integrating optimism into narrative expressions. Wu et al. (2023) also indicated that the positive effect of rational and emotional appeals projects on the amount of funds raised is gradually increasing. Based on charitable donation being an act that can be shaped and facilitated in relational interaction (Gorbatai & Nelson, 2015), more empirical research is required to explore deeply the nuanced effects of diverse emotions in online philanthropic crowdfunding (Ge et al., 2023).

To further explore the emotional nuances in the effectiveness of messages on social networks, this article investigates 394 posts from the social media platform Sina Weibo in China during 2023. The analysis focuses on the presence or absence of human imagery, message sentiment, and message strategies, and their impact on message effectiveness, as measured by audience engagement indicators including likes, comments, and shares—metrics widely accepted in social media marketing research (Lee & Hong, 2016; Wahid & Muhammad Wadud, 2020). By achieving these aims, this article serves as an anchoring point for better understanding the critical role of strategic message design in promoting altruistic health behaviors and providing more effective strategies for those in need to secure donations.

Before engaging with coding and analyses, this study begins by discussing the literature on medical crowdfunding and outlines how emotion contagion theory provides a nuanced framework for understanding message effectiveness through emotional expression. The remainder of the paper discusses the findings, examining which content features—such as the presence or absence of human imagery, message sentiment, and message strategies—are prevalent in medical crowdfunding posts on social media and whether these features influence message effectiveness. Additionally, the study presents the author's gender, author type, and target audience of medical crowdfunding posts screened from the Sina Weibo hashtag #easycrowdfunding.

2. Literature review

2.1 Medical Crowdfunding

Crowdfunding is a method used by businesses, organizations, or individuals to secure financial backing from a large number of people through online platforms, with each contributor providing a small amount (Belleflamme et al., 2014). This approach encompasses various types, including lending-based crowdfunding, equity-based crowdfunding, reward-based crowdfunding, as well as donation-based crowdfunding (Li et al., 2020). Reward-based crowdfunding offers incentives or rewards to contributors, while lending-based crowdfunding provides lenders with a specific return on their investment and emphasizes the relationship between borrowers and lenders. Equity-based crowdfunding enables contributors to acquire ownership stakes through their investments. In contrast, donation-based crowdfunding, or charity-based donation-based crowdfunding, involves supporters donating to charitable causes without expecting any financial or material return (Mollick, 2014).

The existing literature on donation-based crowdfunding emphasizes multiple factors that influence donor behavior and campaign success. The role of social capital and social recommendations has a significant positive impact on crowdfunding outcomes, highlighting the importance of building reputation and recognition (Li et al., 2022). Empathy and perceived credibility are key determinants of donation behavior, both of which are enhanced by the quality of the website and the credibility of the project (Liu et al., 2018). Trust, peer influence, and the enjoyment of helping others are key motivators for both donation and sharing behaviors (Chen et al., 2021; Hou et al., 2021). Nonprofit organizations benefit from the interactive and transparent nature of social media, as such features foster greater trust and

increase donation intentions (Shin & Chen, 2016). Research also indicates that negative emotional framing increases the number of donors and social media shares but decreases the average contribution per donor. While negative messaging is effective for garnering broad support, positive messages are more successful in securing larger individual contributions (Jang & Chu, 2022).

Medical crowdfunding, a distinct form of charitable crowdfunding, is centered on securing funds specifically for individuals' medical expenses. Unlike other charitable campaigns, which typically support groups or organizations, medical crowdfunding is aimed at assisting specific individuals. These campaigns frequently depend on online endorsements to provide transparency and verify the authenticity of the cause. While charitable crowdfunding initiatives are occasionally highlighted prominently on platform homepages, medical campaigns generally are not. Instead, they are primarily shared by fundraisers through social media, with additional distribution by acquaintances and personal networks. Unlike other campaigns, which may leverage celebrity endorsements for visibility, medical crowdfunding is predominantly circulated through everyday social networks (Liu et al., 2022; Nisar et al., 2022; Zhou et al., 2022). Therefore, although recent studies have focused on charitable crowdfunding, their findings are not readily applicable to medical crowdfunding.

Most of the literature related to medical crowdfunding has evaluated factors influencing crowdfunding performance (Liu et al., 2020; Yang et al., 2023), donation willingness (Liu et al., 2022; Wang et al., 2024), and ethical issues (Coutrot et al., 2020; Gonzales et al., 2018; Jin, 2019). While studies have focused on message narratives, the effects of medical crowdfunding messages on crowdfunding performance remain controversial. Specifically, Mao and Zhao (2022) suggested adapting evidence-driven narratives to enhance emotional appeal, while Xu and Wang (2019) emphasized leveraging emotional storytelling to evoke sympathy. Thereafter, Ge et al. (2023) indicated that sadness can positively influence donation outcomes for medical assistance. But Yang et al. (2023) highlighted the importance of conveying optimism by emphasizing the widespread nature of crowdfunding campaigns for medical needs. Therefore, these controversial phenomena require further investigation into the content characteristics and effectiveness of medical crowdfunding messages.

2.2 Emotional Contagion Theory

Emotional contagion refers to the process by which one person or group influences the emotions or behaviors of others, either consciously or unconsciously, by inducing emotional states and attitudes. Fundraising events typically prompt donors to experience similar sentiments (Preston & De Waal, 2002). Complex emotional expressions are communicated through various forms, including facial expressions, vocal tones, gestures, and textual communication (Kramer et al., 2014). In the context of charitable giving, sympathy is an emotionally driven response often triggered by someone else's misfortune, which can promote altruistic behaviors such as giving (Sudhir et al., 2016).

Consistently sharing emotions enables donors to remain engaged with the fundraising process (Majumdar & Bose, 2018). Emotional sharing throughout the campaign further motivates donors to act altruistically and be less concerned about the credibility of the fundraiser, particularly for those who have developed an emotional connection with the campaign (Zhao & Shneor, 2020). Thus, the theory of emotional contagion offers a valuable framework for understanding the impact of content features in online medical crowdfunding. On social media platforms, fundraisers inspire engagement by conveying specialized messages to potential donors, keeping them informed about the progress of the campaign and the patient's current condition.

Extensive prior research demonstrates that tweets featuring visual elements like photographs or images generate greater engagement compared to those without such features (Chung, 2017; Kopke et al., 2019; Wadhwa et al., 2017). Similarly, on Facebook, posts incorporating visual content, especially photographs, tend to elicit higher user engagement than posts lacking visual stimuli (Andrade et al., 2018). It is therefore reasonable to hypothesize that campaign appeals with photographs attract greater engagement across social media, which may lead to a broader donor base.

Charity advertisements often seek to evoke sympathy by depicting victims in charity appeals, as this is believed to foster charitable donation behavior. Potential donors are easily influenced by the emotions conveyed by recipients, particularly through images of facial expressions that elicit emotional responses. For instance, a smiling face can evoke or enhance a sense of happiness, while a sad face can intensify sadness (Cao & Jia, 2017; Small & Verrochi, 2009). Kramer et al. (2014) also found that textual content can serve as a complete channel for sentiment transmission. Negative sentiment expressed in the text can trigger positive online engagement among social media users, particularly in the context of organ donation (Olsacher et al., 2023).

Additionally, message strategy influences audience engagement. Informational message strategies focus on conveying clear, factual, and logically structured messages to inform and educate the audience (Puto & Wells, 1984). These strategies rely heavily on objective information to appeal to the audience's logic and reason (Laskey et al., 1989; Puto & Wells, 1984). Messages delivered through informational strategies are characterized by their clarity, precision, and

conciseness. In contrast, transformational strategies aim to create an emotional connection with the audience, to transform perceptions, attitudes, or behaviors. These strategies employ emotional appeals, storytelling, and symbolic imagery to forge a deeper connection with the audience, aligning with their values, aspirations, and identity (Puto & Wells, 1984). Transformational strategies are designed to engage the audience emotionally, encouraging active participation and investment.

3. Method

A content analysis of 394 Sina Weibo posts was undertaken to analyze the content features of medical crowdfunding posts and their effectiveness. Sina Weibo was selected due to its substantial user base, with 605 million monthly active users as of the end of September 2023 (Weibo Corporation, 2023), which enables users to create and share medical crowdfunding posts for personal reasons.

A total of 539 posts were obtained through criterion sampling for #EasyCrowdfunding posts posted between January 1 and December 31, 2023. Only posts related to medical crowdfunding were selected, and all duplicates and irrelevant posts were excluded to focus on relevant thematic areas, resulting in 394 unique and relevant medical crowdfunding posts. Data was manually extracted from Sina Weibo, including the nickname, gender, number of followers of the fundraisers, text, and the number of times the campaign was liked, shared, and commented on. This study did not include the collection of personally identifiable information such as photographs; all information was publicly available. Data was collected through screenshots and stored on a local drive for subsequent analysis of the static sample.

A codebook was developed based on previous research, including author gender, author type, celebrity involvement, target audience, key themes, the presence of photos with/without humans (Olsacher et al., 2023), message sentiment (Seltzer et al., 2017), and message strategy (Song et al., 2021). The codebook was tested with 50% (n=197) of the medical crowdfunding posts to verify its suitability for the existing categories. Cohen's kappa was used to measure inter-coder reliability, with a kappa value below 0.6 indicating "moderate agreement" between coders (Breslow, 2014). This study involved training two independent coders on 50 medical crowdfunding posts to achieve acceptable inter-coder reliability. In the event of disputes, field experts are consulted to resolve them and reach a consensus.

Audience engagement, widely recognized in social media marketing research (Lee & Hong, 2016; Wahid & Wadud, 2020), was employed as an indicator of post effectiveness. Audience engagement was measured using the likes-to-followers ratio, comments-to-followers ratio, and shares-to-followers ratio to account for the variability in follower counts across accounts. These ratios were calculated by dividing the number of likes, comments, and shares by the number of followers for each account, as a higher follower count generally indicates greater exposure and more opportunities to engage potential donors. This approach effectively standardizes the impact of posts across different social media accounts, regardless of follower count (Fung et al., 2020; Olsacher et al., 2023; Pletikosa Cvijikj & Michahelles, 2013). The Mann-Whitney U test and Kruskal-Wallis test were employed to analyze the relationships between independent variables (image with/without humans, message sentiment, and message strategy) and dependent variables (likes-to-follower ratio, comments-to-follower ratio, and shares-to-follower ratio). Dunn's multiple comparisons test was used to identify differences in categorical variables. Statistical analyses were conducted using SPSS 27, with a significance level set at $p < 0.05$.

4. Results

As shown in Table 1, the majority of posts (62.69%) were authored by females, with private authors (93.65%) significantly outnumbering institutional authors. Posts were mainly targeted at the general population (98.98%) rather than at specific platforms or other groups. Celebrities played a minimal role in medical crowdfunding, with less than 1% of posts featuring them, while 99.24% of posts did not involve any celebrities.

Table 1. Descriptive statistics of results

Type of variable	Category	Frequency	Percent	Cumulative Percent
Gender	Female	247	62.69	62.69
	Male	147	37.31	100
Author	Institutional author	25	6.35	6.35
	Private author	369	93.65	100
Identity	Donor	49	12.44	12.44
	3rd party	245	62.18	74.62
	Fundraiser	100	25.38	100
Celebrity	Not posted with/by celebrity	391	99.24	99.24
	Posted with/by celebrity	3	0.76	100
Target audience	Platform	4	1.02	1.02
	General public	390	98.98	100
Message characteristic	No image of a human	246	62.44	62.44
	Image of a human	148	37.56	100
Message sentiment	Negative	119	30.20	30.20
	Netural	238	60.41	90.61
	Positive	37	9.39	100
Message strategy	Informational	11	2.79	2.79
	Netural	326	82.74	85.53
	Transformational	57	14.47	100
Theme	Medical crowdfunding behavior	179	45.43	45.43
	Anti-fraud	30	7.61	53.05
	Mearchandise/run	20	5.08	58.12
	Meaning	14	3.55	61.68
	Issues	128	32.49	94.16
	Statistics description	9	2.28	96.45
	Others	14	3.55	100.00

Posts related to medical crowdfunding predominantly exhibited a neutral sentiment (60.41%). These posts objectively describe help-seeking information, which primarily includes details such as affiliation, current situation, family income, and type of request. Negative sentiments (30.20%) are the second most common, with posts typically expressing the sadness associated with illness and the helplessness stemming from insufficient funds for treatment. Only 9.39% of the posts exhibited a positive sentiment, reflecting pleasure in offering assistance or making donations.

Among the seven identified themes in medical crowdfunding, the most frequently discussed were 'medical crowdfunding behavior' (45.43%) and 'issues' (32.49%) related to crowdfunding platforms. The third most common topic was 'anti-fraud' (7.61%). Posts addressing the meaning of donations and donation statistics were relatively infrequent, constituting 3.55% and 2.28%, respectively.

Mann-Whitney U tests were conducted to assess whether the effectiveness of medical crowdfunding posts differed based on the presence or absence of a human image, as detailed in Table 2. Statistically significant differences were observed between posts with and without human images in terms of the likes-to-followers ratio and the shares-to-followers ratio, with Mann-Whitney U values of 16034.50 ($p = 0.034$) and 15994.00 ($p = 0.003$), respectively. Posts featuring human images received higher mean ranks, indicating greater effectiveness in terms of likes and shares. However, no significant difference was found in the comments-to-followers ratio between posts with and without human images (Mann-Whitney U = 17643.50, $p = 0.602$). These findings suggest that the inclusion of human images in medical crowdfunding posts positively influences engagement metrics, specifically the likes-to-followers ratio and shares-to-followers ratio, but does not necessarily affect the comments-to-followers ratio.

Table 2. Mann-Whitney U Tests results for the comparison by message characteristic with message effectiveness

Variables	Message characteristic	N	Mean Rank	Sum of Ranks	Mann-Whitney U	P
Likes/followers-ratio	No image of a human	246	188.68	46415.50	16034.50	0.034
	Image of a human	148	212.16	31399.50		
Comments/followers-ratio	No image of a human	246	199.78	49145.50	17643.50	0.602
	Image of a human	148	193.71	28669.50		
Sharing/followers-ratio	No image of a human	246	188.52	46375.00	15994.00	0.003
	Image of a human	148	212.43	31440.00		

A Kruskal-Wallis test was conducted to analyze the relationship between message sentiment (negative, neutral, and positive) and message effectiveness, as measured by the likes-to-followers ratio, comments-to-followers ratio, and shares-to-followers ratio, as detailed in Table 3. No statistically significant differences were found in mean ranks across sentiment categories for the likes-to-followers ratio ($\chi^2 = 0.02$, df = 2, $p = 0.992$) and the shares-to-followers ratio ($\chi^2 = 0.91$, df = 2, $p = 0.635$), indicating that message sentiment did not significantly impact post effectiveness in terms of likes and shares. In contrast, a significant difference in mean ranks was observed for the comments-to-followers ratio across sentiment categories ($\chi^2 = 8.97$, df = 2, $p = 0.011$), indicating that message sentiment affects engagement in terms of comments. Specifically, posts exhibiting negative sentiment had significantly different mean ranks compared to those with neutral and positive sentiment.

Table 3. Kruskal-Wallis Test results for the comparison by message sentiment with message effectiveness

Variables	Message sentiment	N	Mean Rank	df	χ^2	p
Likes/followers-ratio	Negative	119	198.12			
	Neutral	238	196.97	2	0.02	0.992
	Positive	37	198.91			
Comments/followers-ratio	Negative	119	222.67			
	Neutral	238	188.15	2	8.97	0.011
	Positive	37	176.69			
Sharing/followers-ratio	Negative	119	201.50			
	Neutral	238	197.02	2	0.91	0.635
	Positive	37	187.76			

Table 4 displays the results of Dunn's multiple comparison tests, which analyze the relationship between message sentiment (positive, neutral, and negative) and engagement, as measured by the comments-to-followers ratio. In the comparison of posts with positive and neutral sentiment, a p-value of 1.000 indicates no significant difference in engagement levels in terms of comments. Similar results were shown in the comparison of posts with positive and negative sentiment, with a p-value of 0.087. Conversely, the comparison between neutral and negative sentiment posts produced a p-value of 0.018, signifying a statistically significant difference in engagement levels. Posts with negative sentiment elicited higher engagement regarding comments compared to those with neutral sentiment.

Table 4. Dunn's multiple comparisons test comparing message sentiment

Variables	Positive vs Neutral	Positive vs Negative	Neutral vs Negative
Comments/followers-ratio	1.000	0.087	0.018

Table 5 displays the results of the Kruskal-Wallis test, evaluating the relationship between message strategy and message effectiveness. Regarding the likes-to-followers ratio, a significant difference in mean ranks was observed among message strategies ($\chi^2 = 11.73$, df = 2, $p = 0.003$). Specifically, the mean ranks indicate that the informational strategy exhibits the highest mean rank (302.68), followed by the transformational strategy (204.73), and the neutral strategy (192.69). Similarly, regarding the sharing-to-followers ratio, a significant difference in mean ranks was observed among message strategies ($\chi^2 = 43.76$, df = 2, $p < 0.001$). Posts employing an informational message strategy

demonstrated a significantly higher mean rank (350.09) compared to posts utilizing a neutral (193.23) or transformational strategy (192.47), reflecting greater effectiveness in terms of the sharing-to-followers ratio. These findings indicate that informational message strategies are associated with a higher number of likes and shares compared to neutral and transformational strategies.

Table 5. Kruskal-Wallis Test results for the comparison by message strategy with message effectiveness

Variables	Message strategy	N	Mean Rank	df	χ^2	p
Likes/followers-ratio	Informational	11	302.68			
	Neutral	326	192.69	2	11.73	0.003
	Transformational	57	204.73			
Comments/followers-ratio	Informational	11	266.82			
	Neutral	326	197.35	2	4.94	0.085
	Transformational	57	184.99			
Shares/followers-ratio	Informational	11	350.09			
	Neutral	326	193.23	2	43.76	0.000
	Transformational	57	192.47			

Table 6 displays the results of Dunn's multiple comparisons test, assessing the differences in message strategy concerning the likes-to-followers ratio and the sharing-to-followers ratio. Regarding the likes-to-followers ratio, the comparison between transformational and neutral message strategies resulted in a *p*-value of 1.000, indicating no statistically significant difference in engagement levels. Conversely, the comparison between transformational and informational message strategies yielded a *p*-value of 0.002, while the comparison between neutral and informational message strategies resulted in a *p*-value of 0.015, indicating significant differences in engagement levels. Specifically, transformational strategies were associated with higher engagement than neutral strategies, whereas informational strategies were associated with higher engagement than transformational strategies.

Table 6. Dunn's multiple comparisons test comparing message strategy

Variables	Transformational vs Neutral	Transformational vs Informational	Neutral vs Informational
Likes/followers-ratio	1.000	0.015	0.002
Sharing/followers-ratio	1.000	0.000	0.000

For the shares-to-followers ratio, similar results were observed. The comparison between transformational and neutral message strategies yielded a *p*-value of 1.000, indicating no statistically significant difference in engagement levels. Conversely, the comparisons between transformational and informational message strategies, as well as between neutral and informational message strategies, yielded *p*-values of 0.000, indicating significant differences in engagement levels. In both instances, informational strategies were associated with higher engagement than both transformational and neutral strategies.

5. Discussion

For the shares-to-followers ratio, similar results were observed. The comparison between transformational and neutral message strategies yielded a *p*-value of 1.000, indicating no statistically significant difference in engagement levels. Conversely, the comparisons between transformational and informational message strategies, as well as between neutral and informational message strategies, yielded *p*-values of 0.000, indicating significant differences in engagement levels. In both instances, informational strategies were associated with higher engagement than both transformational and neutral strategies.

This study examined the content features of medical crowdfunding messages on social media platforms from the perspective of narrative strategy. Based on emotional contagion theory, the content features of medical crowdfunding messages were classified into three categories: the presence of human photos, message sentiment, and message strategy.

Empirical research revealed that most posts did not include photographs of humans and frequently conveyed predominantly neutral sentiments. The analyzed posts mainly employed both informational and transformational strategies, with fewer posts utilizing solely informational strategies. Furthermore, the inclusion of human photos and negative sentiment increased engagement in terms of likes and shares, while negative sentiment specifically affected the effectiveness of comments.

5.1 The Content Feature of Medical Crowdfunding Message

Photographs of humans in medical crowdfunding posts remain relatively scarce. Interactions with fundraisers on social networks often represent weak ties (Gonzales et al., 2018). These weak ties enable patients to avoid disclosing sensitive treatments, physical changes, and vulnerabilities to those with close personal connections. Overall, public self-presentations may infringe upon privacy, even though they are crucial for obtaining social and instrumental support online. In many instances, disclosing information online involves sharing personal details that individuals may be uncomfortable revealing to a wide internet audience. Medical crowdfunding has intensified the conflict between social media portrayals that provide neutral or deliberate self-improvement messages and those soliciting financial assistance from a network of acquaintances and strangers during periods of severe physical and emotional distress (Gonzales et al., 2018). In response, some individuals opt to remove personal information and retain it on private web pages or blogs, intentionally withholding specific details (Ellison et al., 2011).

Emotional expressions on social media can influence users' emotions even in the absence of nonverbal cues or direct interaction, leading to widespread emotional contagion on social networks (Kramer et al., 2014). The majority of the posts analyzed in this study depicted the plight and described the status quo with a dispassionate and neutral sentiment, rather than conveying strong negative or positive emotions. Fundraisers frequently express sorrow, worry, and apprehension when confronting potential death or significant health issues affecting their loved ones (Ge et al., 2023). However, this study did not reveal such strong emotional expressions.

Most of the medical crowdfunding posts analyzed employed both informational and transformational message strategies concurrently, with transformational strategies being more prevalent than informational strategies. The integration of informational and transformational strategies creates a holistic approach that appeals to both the rational and emotional aspects of potential donors. Informational content is perceived as credible and transparent, meeting the cognitive need for clarity and trust, while emotional content can engage affective responses, driving empathy, urgency, and social sharing. This combination is commonly used in medical crowdfunding assistance posts. Only a limited number of posts utilized either emotional or informational strategies, presenting events or opinions in either an extremely objective or subjective manner.

5.2 Posts with Images of Human Impact Likes and Shares

Photographs play a crucial role in presenting an activity and are particularly effective in eliciting emotional responses. Posts that include photographs often reveal medical diagnoses and treatment details, portraying the patient's plight and providing credible evidence of the case, thus offering illustrative cues to potential donors. Potential donors assess the project's credibility by evaluating these photographs (Kim et al., 2016). Photographic evidence is also effective in eliciting empathy, a critical factor in motivating support and increasing the likelihood of crowdfunding success (Bielefeld et al., 2005; Majumdar & Bose, 2018; Raab et al., 2020).

The vividness of the message positively influences user engagement (Ji et al., 2019), and incorporating images can enhance social media interaction (Andrade et al., 2018; Bonsón et al., 2015; Wadhwa et al., 2017). This study confirms that messages featuring images of individuals result in increased engagement through likes and shares, which is consistent with the findings of Olsacher et al. (2023). They found that messages with images of individuals enhance social media engagement in terms of likes and shares, particularly for organ donation posts on Instagram. Tweets with images had higher retweet rates compared to those without (Chung, 2017). Furthermore, the finding that posts with images increase the likelihood of receiving likes corroborates the findings of Sabate et al. (2014).

5.3 Negative Emotions Impact Comments

Emotional appeals persuade by eliciting emotions in the audience, thereby influencing decision-making (Zhang et al., 2021). Prospective donors may empathize with the described situation by visualizing the project when reading its description, which is designed to encourage donations (Eisenberg & Eggum, 2009). This immersive experience may result in them experiencing the same emotions conveyed in the project presentation through emotional contagion (Ge et al., 2023). Indeed, pro-social behavior relies heavily on intuitions derived from the pathos model, which serves as the primary catalyst for moral decision-making (Lindauer et al., 2020).

Sadness can increase medical crowdfunding donations, primarily by evoking empathy (Baberini et al., 2015; Small & Verrochi, 2009). Individuals tend to show greater compassion and are more inclined to donate when they observe a sad

expression compared to a happy or neutral one (Small & Verrochi, 2009). Emotionally charged messages can lead to deeper user engagement (Ji et al., 2019; Swani & Milne, 2017). The finding that negative sentiment in posts results in higher engagement in comments aligns with Akpinar & Berger (2017) and Swani & Milne (2017), who discovered that emotional appeals often drive comments rather than likes. Encountering posts that evoke negative emotions may lead individuals to express their feelings or empathize with others who have similar experiences. Negative posts may elicit expressions of empathy and support from netizens who identify with the emotions expressed. This emotional resonance can lead to increased commenting as people seek validation, support, or catharsis in response to negative content. However, this finding contrasts with Zheng and Jiang (2022), who identified that expressions of optimism are associated with higher medical crowdfunding performance.

5.4 Informational Strategies Influence Likes and Shares

Highly credible requests are more likely to secure contributions. Clearly stating the purpose of the contribution reduces information gaps and effectively communicates trustworthiness to potential donors (Gleasure & Feller, 2018). Informational strategies deliver fact-based, evidence-driven messages that appeal to the rational and logical aspects of social media users. Detailed narratives that outline the need in the presentation encourage the audience to engage in logical thinking about the target event, thereby enhancing the persuasive impact (Wu et al., 2023). In medical crowdfunding, if donors question the campaign's authenticity, they may not experience an emotional reaction or empathy (Gao et al., 2019).

Informative message content significantly affects people's engagement (Araujo et al., 2015; Taylor et al., 2011; Xiang et al., 2019). Araujo et al. (2015) noted that information cues on Twitter are powerful predictors of high levels of sharing, based on a three-year analysis of global brand messages, whereas emotional cues are not. Campaigns that include objective messages can reduce uncertainties related to campaign organization and deliverables, thereby enhancing donation performance (Tafesse, 2021). This phenomenon of greater engagement with neutral and objective information also reflects a crisis of trust in China. Individuals are likely to adopt a rational perspective when assessing the authenticity of help-seeking posts on social media (Guo et al., 2023) and approach donations with caution (Olsacher et al., 2023).

6. Conclusion

This finding underscores the relationship between content features and message effectiveness in medical crowdfunding, providing fresh insights into their significance. Specifically, our study conceptualizes different types of content appeals and elucidates their roles in enhancing audience engagement for medical crowdfunding posts. Moreover, our research empirically measures the relative effectiveness of various content features derived from emotional contagion theory in the context of online medical crowdfunding. We found that including photos with humans, negative sentiment, and using an informational strategy increased the likelihood of engaging social media users. Additionally, our results indicate that medical crowdfunding messages do not always result in effective communication. The content features of posts significantly influence the interaction between fundraisers and potential donors on social media.

This study contributes to the understanding of medical crowdfunding messages by empirically testing the influence of narrative strategies on social media. This study pioneers efforts to quantify the impact of various content features on the effectiveness of medical crowdfunding messages, thus enriching the discourse on information effectiveness through the comparison of different contextual aspects. Unlike previous studies that have primarily focused on the textual features of project presentations in crowdfunding performance, our research highlights the importance of content features in fostering audience interaction. By investigating the role of emotional appeals, we uncover the complexities of audience engagement influenced by content features, thereby complementing and expanding upon existing research.

Finally, the findings are subject to at least three limitations. First, the posts in this study were collected using a single term, "easy crowdfunding", which limits the representativeness of all medical crowdfunding messages on Sina Weibo. Future studies should examine larger samples using a variety of terms to enhance the generalizability of the results. Second, posts are exposed to varying numbers of followers, and active followers contribute to greater social media engagement. While this study attempts to control for this factor, further improvements are possible. Third, the expression of emotions is highly subjective, and manual annotation may not adequately reflect the true emotions of users; future research could use computer-assisted tools, such as machine learning methods, to improve accuracy.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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