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The Impact of Obesity-Related Information on Social Media on Users' Body Perception and Behavior: A Case Study of Xiaohongshu

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Abstract. In recent years, the global prevalence of overweight and obesity among children and adolescents has been continuously rising. Data from the 2009-2010 National Health and Nutrition Examination Survey (NHANES) showed that among 4111 adolescents aged 12 to 19, the prevalence rates of overweight and obesity were 15.2% and 18.4%, respectively. Concurrently, global social media usage has tripled in the past decade, growing from 970 million to 2.96 billion users. Against the dual trends of rising global adolescent obesity rates and the proliferation of health information on social media, numerous obesity-related posts appear on online platforms, but the quality of this information varies widely and requently contains misleading content. This study aims to analyze the impact of obesity-related health information on social media (such as weight loss advertisements, body image displays, and dietary advice) on users' behavior, psychology, and body perception. Relevant literature was retrieved from PubMed, and content analysis was conducted based on relevant research from recent decades. Simultaneously, a new account was registered to search for posts using the keywords "obesity" and "weight loss." The top 120 relevant posts from the search results were collected. After removing advertisements and non-original content, the remaining posts were evaluated. Although social media health information may exacerbate body dissatisfaction through social comparison mechanisms, scientific health communication can emerge as a new intervention pathway.

Keywords: Social Media, Obesity, Misinformation, eHealth, Health Information

1. Introduction

Obesity remains a significant public health problem [1]. The global prevalence of overweight and obesity among children rose from 4.2% in 1990 to 6.7% in 2010 [2]. Previous studies indicate that social support is effective for weight management in overweight individuals, and as such, social media can exert a significant influence on the weight loss behaviors of obese patients [3,4]. However, with the development of social media, some erroneous health information spreads rapidly, causing problems in the health domain [5,6]. Within this context, research on obesity-related information on Chinese social media platforms remains relatively scarce, particularly systematic analyses focusing on specific platforms. This study selects Xiaohongshu (The Red Book) for in-

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depth research due to its popularity in China, its text-dominant post format, and the ease of data collection. This research aims to investigate health information regarding obesity on the popular Chinese social media platform "Xiaohongshu," to demonstrate trending perspectives on obesity within the platform, prove the benefits of credible health information for users, while revealing the potential harms of misleading content, ultimately proposing feasible methods to improve the quality of online health information. To achieve these goals, the study will reviewing and summarizing relevant literature; manually collecting obesity-related posts on Xiaohongshu and categorizing them (Scientific Weight Loss, Extreme Weight Loss, Body Acceptance, Vague/Neutral); assessing the proportion of each concept type; conducting interaction analysis, and summarizing the differences in interaction levels across different post types.

By studying the types and interactions of obesity-related information on social media, we can understand platform users' views on obesity, providing strategies for enhancing the quality of health information and promoting the dissemination of high-quality health information. This research project can help improve the content moderation mechanisms of these social media platforms, thereby reducing the spread of erroneous or extreme information.

2. Methods

The data for this study was sourced from the Xiaohongshu platform. To prevent personalized recommendations based on previous search history from affecting the platform's algorithm, a new Xiaohongshu account was registered to ensure data accuracy. Using the keywords "obesity" and "weight loss" on the search page, the first 120 recommended posts related to obesity and weight loss were extracted from the homepage results.

During the preliminary screening, advertisements, content reposted by non-personal accounts, and duplicate posts were excluded, resulting in 106 original posts that met the criteria. As all these posts were published within the last three years, no time-based filtering was applied. To ensure the reliability of post classification, each post was independently categorized by two researchers, with the final result being mutually agreed upon. The classification system included: (1) Scientific Weight Loss: Methods based on aligned with recommendations from professional bodies, such as dietary guidelines or exercise science; (2) Extreme Weight Loss: Involving very low-calorie intake or excessive exercise, e.g., 21-day fasting or induced vomiting; (3) Body Acceptance: Advocating for accepting imperfect body types or opposing weight discrimination; (4) Body Anxiety: Expressing negative emotions about weight or social pressure; (5) Other: Content that could not be categorized into the aforementioned categories.

For data analysis, a mixed-methods approach was adopted. Qualitatively, the core narrative frameworks of each category were extracted. Quantitatively, the frequency distribution and relative proportion of each category were calculated. Additionally, the interaction level for each post (number of likes + number of favorites + number of comments) was calculated. Based on the distribution of interaction levels on the platform, posts were divided into three tiers: Low interaction (<1,000), Medium interaction (1,000-10,000), and High interaction (>10,000). All data were recorded and analyzed using Excel spreadsheets.

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3. Findings and analysis

3.1. Content distribution and interaction patterns

Content analysis of the 106 valid samples revealed that Scientific Weight Loss content accounted for the largest proportion, followed by Extreme Weight Loss and Other categories, while Body Acceptance and Body Anxiety-related content made up relatively smaller shares (See Figure 1). This indicates that discussions on weight loss issues on the Xiaohongshu platform are still dominated by scientific guidance; however, extreme weight loss methods also occupy a considerable share, reflecting users' continued focus on quick-results methods. In terms of interaction levels, Scientific Weight Loss content had the highest number of high-interaction posts, followed by Extreme Weight Loss content. This suggests that although mainstream platform content advocates scientific methods, extreme weight loss content may be more provocative and impactful in terms of dissemination. For example, extreme weight loss posts often use sensational titles like "Lose weight drastically in a short time" or "Lose 10kg in one month," accompanied by stark comparison images. Even with platform regulations, they can still achieve high interaction through implicit expression or moderation oversights. This reflects users' contradictory psychology: on one hand, they recognize the rationality of scientific weight loss; on the other hand, they exhibit curiosity or even an inclination to try quick-fix methods.

Furthermore, the proportions of Body Acceptance and Body Anxiety posts were relatively low, and their interaction performance showed little difference, presenting a subtle balance. The coexistence of these two content types—with similar proportions but contrasting emotional tones—reflects contemporary young people's contradictory attitudes toward body image: they aspire to accept their bodies yet struggle to fully shake off societal aesthetic pressures.

3.2. Existing problems

Previous studies have shown that social media contains a large amount of non-professional health information, which affects patients' attitudes toward their conditions and thus delays treatment [7,8]. Taking obesity-related content as an example, the analysis results of this study show that Extreme Weight Loss and Body Anxiety posts still account for a relatively large share (see Figure 1). Another study also indicated that over 40% of posts on Xiaohongshu convey appearance-focused concepts [9]. Although such posts can remind users who are overweight to pay attention to their diet and manage their weight to maintain health, they can also cause unnecessary anxiety, prompting users of normal weight to engage in excessive weight loss.

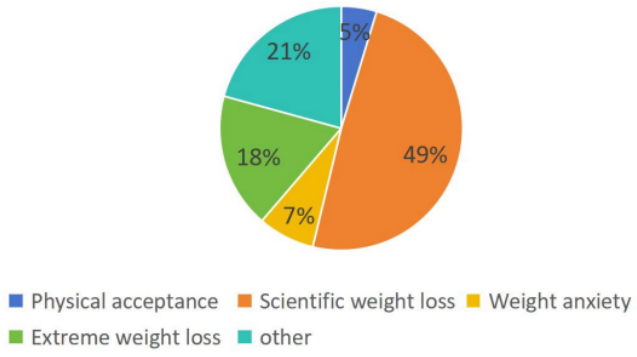

Figure 1. Distribution of different types of obesity-related posts

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Secondly, psychological research shows that misinformation is often more novel, making recipients more inclined to share it [10]. Social media, based on reward mechanisms, encourages users to share information to attract attention, thereby accelerating the spread of false information [10,11]. This study's analysis of interaction levels found that Extreme Weight Loss posts had higher interaction levels (see Figure 2). Their exaggerated content easily attracts attention and subtly changes the value orientation of platform users, popularizing excessive weight loss online.

Additionally, image-centric platforms (like Xiaohongshu) are more likely to trigger appearance or body anxiety compared to text-dominant platforms (like Facebook) [12]. In the photo-centric social media environment, users often focus on appearance, generating numerous negative appearance comparisons, which in turn lead to negative impacts [13]. For example, the emergence of weight loss-related misinformation can easily induce users to attempt excessive or extreme weight loss behaviors, which severely compromise their physical health and may even lead to psychological issues.

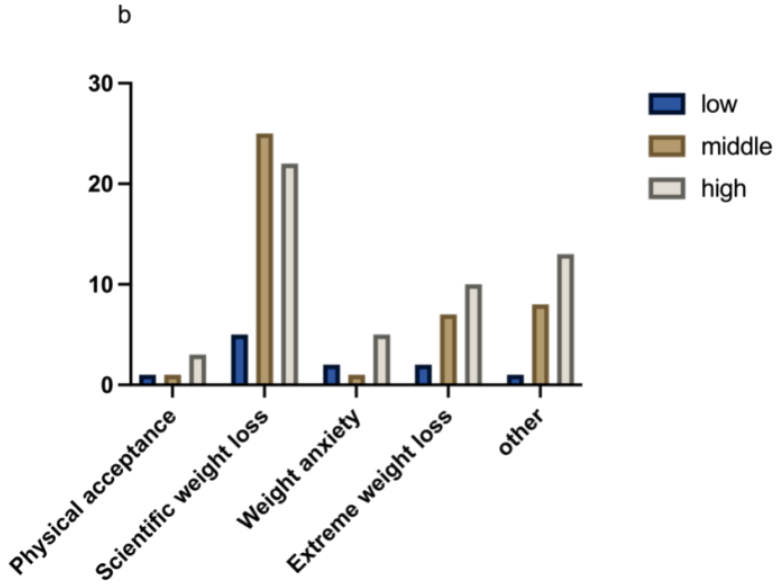

Figure 2. Interaction analysis of obesity-related posts

4. Solutions and feasibility analysis

4.1. Optimizing the incentive structure of social media

Current platform recommendation algorithms is centered on the "attention economy." Whether content can elicit strong emotional reactions directly influences its reach, while dimensions of value like authenticity and accuracy are systematically marginalized. False or exaggerated weight loss content is often more emotionally provocative and has higher viral potential, making it more likely to be identified and promoted by the algorithm [14]. This incentive structure that prioritizes "traffic above all else" regardless of truth is essentially a systemic risk resulting from the collusion between the platforms, content creators, and some users.

To break this vicious cycle, a "credibility score" system could be introduced at the algorithm level, linking content credibility (e.g., presence of reliable sources, certification by authoritative institutions, flags from fact-checking tools) to recommendation weight, creator revenue share, and even account weight. Research has shown that when disseminating accurate information brings

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tangible traffic incentives and reputational rewards—while spreading false information results in recommendation restrictions or even financial penalties—users' (especially high-influence accounts') sharing behaviors tend to become significantly more rational. This would thereby curb the spread and impact of misinformation at its source [15]. This shift requires platforms to assume greater social responsibility, incorporating "information health" into their core performance indicators, not just daily active users and user engagement time.

4.2. Involving experts in relevant fields

The most effective means to combat erroneous health information in specialized domains is to dilute and replace it with a supply of high-quality, high-credibility information. In the highly scientific and easily misled field of obesity and weight management, the absence of professional voices is a key reason for the proliferation of false content. Therefore, platforms should proactively invite experts to join, building a professional knowledge dissemination system. This could take the form of collaborating with experts in relevant fields, adding special labels to their content, and prioritizing the promotion of such content to target users; establishing special features like "Obesity Science Column" or "Weight Management Frontiers" for health science popularization, interpreting the latest consensus guidelines in an accessible manner, analyzing the scientific principles behind popular weight loss methods, and promptly debunking prevalent pseudo-scientific myths. Research in the cardiovascular field has shown these methods can be effective for academic promotion and are feasible [16]. This "authoritative voice" not only provides reliable information but, more importantly, shapes users' information evaluation standards—when users are repeatedly exposed to scientifically rigorous discourse, they will spontaneously develop "immunity" to exaggerated claims and false information.

4.3. Developing a diet monitoring mini-program

The ultimate goal of information dissemination is to influence users' cognition and behavior. Therefore, governance strategies cannot be limited to the information level alone; they must also consider practical applications to exert a meaningful impact on users. Technological tools can help users translate scientific knowledge into daily practices, thereby assisting them in maintaining a healthy weight. Social media platforms hold a significant advantage: vast amounts of user-shared, authentic, and contextualized data.

Therefore, it is recommended that platforms invest in developing, or collaborate with professional institutions to develop, associated "Intelligent Diet Monitoring and Health Guidance Mini-Programs." Data collected from social media can supplement traditionally surveyed data, enabling more effective tracking and monitoring of individuals' dietary intake and nutrient levels [17]. By setting scientific goals, recording progress, and providing positive feedback, the often tedious weight loss process can be gamified and socialized, creating a supportive closed loop for users to undertake long-term, scientific, and healthy behavioral changes, thereby endowing platform data with new value.

4.4. Feasibility analysis

Collaborating with platforms to optimize recommendation algorithms and introduce a "credibility score" system, while involving complex interdisciplinary collaboration and system modification, aligns with their long-term reputation building needs and is feasible at a strategic level. Introducing

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experts to build a certified content system, though requiring sustained resource investment and operational support, can be gradually implemented by leveraging the existing creator ecosystem and traffic distribution mechanisms; successful practices in vertical fields like healthcare, both domestically and internationally, also verify its effectiveness. Developing a diet monitoring mini-program can not only enhance user stickiness and data value but also extend health governance from the information layer to the behavioral layer, relying on relatively mature image recognition and personalized recommendation engines technologically. Overall, this proposal organically combines platform responsibility, professional expertise, and technological tools, demonstrating high feasibility in terms of cost-benefit ratio and social benefits. It holds promise for systematically suppressing misinformation and promoting the formation of healthy behaviors.

5. Conclusion

On social media, scientific weight loss constitutes the mainstream, but posts related to body anxiety and extreme weight loss also account for a significant proportion. Interaction analysis shows that body acceptance content receives less interaction, while scientific weight loss and extreme weight loss content garner more. This phenomenon reflects the deep-seated contradictions in health information dissemination within the current social media environment: on one hand, users generally endorse the concept of scientific weight loss; on the other hand, under the dual pressures of the "attention economy" algorithm logic and aesthetic culture, content promoting rapid, extreme physical transformations remains prevalent. This not only fuels body anxiety but may also induce users to adopt weight loss behaviors that endanger their health.

This study reveals the main problems within the obesity information ecosystem on social media from three levels: information quality, dissemination mechanisms, and user psychology: low-quality and misleading content proliferates due to its dissemination characteristics, professional voices are marginalized, and users are chronically exposed to health risks and psychological pressure. To address these issues systematically, this paper proposes interventions from three aspects: algorithm mechanisms, content supply, and behavioral support, constructing a collaborative governance path involving "platform - expert - user." This entails reforming the incentive structure of recommendation algorithms, introducing an expert-certified content system, and developing diet monitoring and health guidance tools, working together to create a healthier, more responsible social media information environment.

Certainly, this study has limitations. Firstly, the data sample is derived from a static keyword-based search at a specific time point, unable to capture the dynamic evolution of content and long-term trends. Secondly, the research primarily focuses on content analysis, lacking empirical tracking and causal verification of changes in user cognition, attitudes, and behavior. Finally, the sample collection is limited to a single platform, so extrapolating the conclusions requires caution. Future research could further incorporate longitudinal data collection, in-depth user interviews, and experimental interventions to more deeply reveal the impact mechanisms of social media health information. It could also expand to comparative analyses across different platforms to provide more universal and targeted governance insights.

In summary, the development of social media presents both new challenges for health communication and holds the potential for new opportunities for intervention and guidance. Promoting platform optimization of information distribution mechanisms, strengthening professional authoritative voices, and cultivating user health literacy are not only intrinsic requirements for improving the online information ecosystem but also essential pathways for leveraging digital means to promote public health.

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