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Quality of information and social norms in Spanish-speaking TikTok videos as levers of commercial practices: The case of semaglutide

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ABSTRACT

Social media can be a platform to spread misinformation and reinforce potentially harmful norms in the interest of commercial actors. There are norms related to obesity that commercial actors promote such as "obesity is an individual problem" and the "pharmaceuticalization of obesity". In this study, we assess the quality of information about semaglutide, and the descriptive norms related to its use as levers of commercial practices in social media. We carried out a content analysis of Spanish speaking TikTok videos published between January 2022 and November 2023. We used the DISCERN instrument to assess the quality of information and classified the social norms disseminated through the videos and the narrating voices. The overall quality of information was low, with a mean DISCERN score of 29.8 out of 75. Although healthcare professionals and professional communicators performed slightly better compared to other voices, critical aspects of good health communication were often lacking; 155 videos (71%) did not mention any risk related to the use of semaglutide and only 11.9% of videos mentioned one or more serious risks. In 85% of videos, obesity was depicted as an individual problem. About half of the videos normalized the use of semaglutide and 79% of videos promoted the pharmaceuticalization of obesity by mentioning losing weight as a benefit of using semaglutide but not mentioning the need to make lifestyle changes. The combination of poor-quality health information and the promotion of potentially harmful norms related to semaglutide use is a public health concern. Further research on the commercial determinants of health in the context of semaglutide use is needed, as well as actions to mitigate the risks of misinformation and harmful health-related norms.

1. Introduction

Social media allows people to create, browse and broadcast content about any topic, including health. The democratization of health information is seen as a positive result of social media platforms; the information is "consumer" centered, personalized, and participatory (Schneider-Kamp and Takhar, 2023). Furthermore, social media has been used as a health promotion tool and peer support aide (Waring et al., 2018). However, social media can serve as a platform for both spreading public health-related misinformation—such as on COVID-19 and prostate cancer—and reinforcing potentially harmful social norms that align with the interests of commercial entities (Baum et al., 2020; Islam et al., 2020; WHO, 2021; Baumel et al., 2021; Xu et al., 2021). Studying social media's impact on public health is vital as it reshapes health communication by democratizing information sharing, influencing discourse, norms, behaviors, and policy adoption on a global scale (Schillinger et al., 2020).

Commercial actors can leverage information and social norms to advance their interests, influencing behaviors and driving the consumption of specific products and services, often at the expense of public health (Gilmore et al., 2023). To date, research on commercial determinants of health, defined as "the systems, practices, and pathways

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through which commercial actors drive health and equity" (Gilmore et al., 2023), has focused foremost on defining the concepts, understanding the health effects from commercial products and the practices of commercial entities (Allen et al., 2022; Gilmore et al., 2023; Kickbusch et al., 2016; Madureira Lima and Galea, 2018; Mialon, 2020). To better understand the interwoven relationship between commercial actors and population health, research needs to address the social systems in which commercial actors operate, and the levers used such as misinformation and social norms (Gilmore et al., 2023). In this study, we are interested in analyzing misinformation and social norms related to the use of a popular pharmacological treatment for obesity disseminated through social media. Our focus is on misinformation and norms that can serve to further the interests of commercial actors and potentially damage people's health.

1.1. Social norms shaping health behavior

While there is a considerable body of research on health-related misinformation on social media, few studies have looked at social media as a space for shaping social norms (Chinn and Hasell, 2024; Lutkenhaus et al., 2023). Social media content shows us what our friends, families, and opinion leaders are doing and what they believe we should do (Melnyk et al., 2022). Norms, as unwritten codes of conduct that are negotiated and shaped through social interactions in specific contexts (Hechter and Opp, 2001), are instrumental to understanding social life and constitute a foundational sociological theory (Horne and Mollborn, 2020). Descriptive norms refer to the prevalence of a behavior or what people perceive others do, while injunctive norms refer to what people believe about what others think should be done and are enforced through social repercussions (Chung and Rimal, 2016a). The underlying motivations they serve are also different. Descriptive norms influence behavior by appealing to people's desire to be socially appropriate. People believe that a behavior is socially approved if they observe many others engage in that behavior. Injunctive norms influence behavior by appealing to people's values and sense of belonging to a specific group.

Given the influence norms can have on behavior, not only scholars from different disciplines, but also commercial actors are interested in them (Akfırat et al., 2023; Kane et al., 2023). Social norms and societal expectations shape the kinds of goods and services that we consume, or the value or meaning attached to certain consumption patterns (Veblen, 1899). Norms can play a role in shaping health by encouraging unhealthy habits such as smoking or healthy habits like wearing seat belts, masks, or exercising (Cislaghi and Heise, 2018, 2019; Echeverría et al., 2015; Carpenter et al., 2019; Hang et al., 2020; Lutkenhaus et al., 2023). In this study, we focused on descriptive norms, the observed prevalent behaviors and their content in social media. We were interested in identifying the norms disseminated through social media related to semaglutide, a popular obesity medication that serves commercial interests and may pose risks to people's health.

1.2. Commercial actors, social norms and the medicalization of obesity

Commercial actors have influenced norms related to obesity, from promoting certain ideals of body size to the "medicalization of obesity" (Fabbri et al., 2018; Hofmann, 2016), defining health problems in medical terms, and the "pharmaceuticalization" – the creation of pharmaceutical opportunities by framing human experiences (Bombak et al., 2022). Obesity is widely recognized as a major public health problem globally, in Latin America and the Caribbean 35% of women and 26% of men were living with obesity in 2022 (Phelps et al., 2024,; WHOa,2024), with an economic impact ranging from 0.05% to 2.4% of domestic product in high- and middle-income countries (Nagi et al., 2024). However, critical perspectives on obesity challenge the notion of obesity as a disease and critique the focus on external factors such as the measurement of body mass index. Scholars in this field argue for shifting away from weight-focused approaches and public health policies, toward weight-inclusive approaches (Hunger et al., 2020; Stefánsdóttir, 2020).

The framing of obesity as an individual issue is problematic because it shifts the focus away from critical social and commercial determinants, making pharmacological treatments appear as the primary solution (Chen and Herper, 2023). Commercial actors can influence what is seen as a public health problem, what are acceptable and unacceptable solutions, and who is responsible for solving the issue (Gilmore et al., 2023). The shaping of health problems as individual ones is also found in the context of other conditions. Literature in political science has pointed out that commercial actors such as tobacco companies often enhance messages that emphasize individual rights and de-emphasize the role of the state in protecting the rights and the wellbeing of the population(Brownell and Warner, 2009a). Over-medicalizing obesity and excessive reliance on biomedical solutions may prioritize commercial and professional interests over the well-being of individuals and public health. This may also lead to costly and potentially ineffective "quick fixes" that fail to address underlying social factors (Hofmann, 2016).

Social media has emerged as a space to shape norms regarding health conditions and treatments. A recent commentary argues that the promotion of semaglutide, exogenous testosterone, and sildenafil on social media normalizes the use of these medications for lifestyle enhancement, raising ethical concerns about their impact on societal health norms, perceptions of body image, and the medicalization of everyday life (Hirst and Turnock, 2024). Social media has played a key role in the promotion of semaglutide partly enabled by the lack of regulations on medicine advertisement that apply to all other media except social media in many countries (Burki, 2022; Carboni et al., 2024; Keating and Wild, 2023; Lexchin and Mintzes, 2023; Robinson, 2022; Vermaak, 2024). The growing popularity of semaglutide has raised concerns about equity, shortages affecting vulnerable populations, inappropriate prescribing practices, widespread off-label use, and increased risks associated with access to unregulated markets (Wang et al., 2024; Suran, 2023; Hirst and Turnock, 2024; Basch et al., 2023).

Even though the sale of semaglutide requires a prescription by a physician in countries in Latin America, in practice, as many other medicines requiring prescription, semaglutide is often sold over the counter without prescription for its off-label indications in countries like Argentina (Blanco, 2023), Brasil (Machado, 2024), Chile (Instituto de Salud Pública de Chile, 2023), Colombia (Instituto Nacional de Vigilancia de Medicamentos y Alimentos, 2023), and Mexico (Navarro, 2024). Social media sites and online clinics claim to offer this new treatment raising concerns about safety and regulation (Whitley et al., 2023; Hirst and Turnock, 2024). A recent study found that semaglutide products are actively being sold without prescriptions by illegal online pharmacies, with vendors shipping unregistered and falsified products, emphasizing the need for enhanced pharmacovigilance to address harms, including those from online sourcing (Ashraf et al., 2024). The World Health Organization (WHO) issued its first official alert on falsified semaglutide products, including Ozempic, increasingly reported globally since 2022, with confirmed cases detected in Brazil, the UK, and the US in late 2023 (WHO,2024b).

1.3. TikTok as prominent social media platform in Latin America

TikTok is the fastest growing social network, and its users are exposed to a wide promotion of commercial products and lifestyles, as well as misinformation and descriptive norms, which can have a significant impact on health such as unhealthy food (Brooks et al., 2022), vaping (Jancey et al., 2023) and alcohol (Bagenal et al., 2023).TikTok had approximately 333 million users over the age of 18 in Latin America as of early 2024 (Kemp, 2024). In comparison to printed media and TV, medicine promotion is not well regulated on TikTok, and oversight is lacking. The quality of information and the types of social norms being

promoted in TikTok regarding the use of semaglutide have not been studied to date. It has been well-documented that under uncertainty, people turn to other's behavior to guide their own (Chung and Rimal, 2016b). The appearance of a new pharmacological treatment raises questions about its adverse effects, expected benefits, and long-term effects. Thus, studying the norms related to the use of semaglutide is particularly relevant, along with analyzing whether they serve as levers of commercial practices (Hirst and Turnock, 2024). There is a gap in understanding the descriptive norms that enhance and reinforce commercial interests and practices in the context of semaglutide.

Given the scale of the global obesity epidemic, the potential profits from semaglutide could be enormous, while the societal costs remain uncertain. Research on potentially harmful norms disseminated through social media as levers of commercial actors is crucial to addressing the commercial determinants of health. Our objectives were twofold: To assess the quality of information about semaglutide in Spanish speaking media content, and to identify the norms that may encourage unhealthy behavior and serve commercial interest related to the use of semaglutide to lose weight.

2. Methods and data

We carried out a content analysis of Spanish speaking TikTok videos published between January 2022 and November 2023. This timeframe was chosen to coincide with the increasing discussion of semaglutide on social media and media outlets in the United States (Blum, 2023; The Economist, 2023), which rapidly spread to other countries in Latin America.

We curated a list of eligible videos following a standardized process. The process began by retrieving video files using automated scripts and pre-specified keywords from new TikTok accounts that we trained by searching for the word "semaglutide" at least three times a day over a period of five days and watching the selected videos. Scraping of videos was performed with the following keywords: "Ozempic México", "Rybelsus México", "Semaglutida México", and "Wegovy México". Initially, we aimed to identify videos about semaglutide generated by users in Mexico and targeting Mexican population. However, TikTok's algorithm prioritizes keywords, hashtags, and viewing patterns over geographic location, making it difficult to restrict the search to a specific region. The videos retrieved were in Spanish but the users who generated them were from different countries. More details about the video retrieval and selection process can be consulted in Appendix A. We obtained 1317 videos that were randomly assigned to researchers who assessed their eligibility. Inclusion criteria included: videos in Spanish or Spanish subtitles, videos explicitly mentioning semaglutide or brand names. A final sample of 218 videos was used for analysis. Fig. 1 illustrates the sample selection process.

3. Evaluation instrument

The content of each video was evaluated using criteria from an adapted version of DISCERN. DISCERN is a validated, mixed-methods instrument to assess the quality of written information about health treatments. Its premise is that such information must be accurate, support shared decision-making, and based on the best available scientific evidence. Although DISCERN was initially designed for assessing written publications, (Charnock et al., 1999), Qiu and Zhou (2024), Lukić and Petrović (2023), and Subramanian et al. (2023) applied the original DISCERN framework with minimal changes, modifying it slightly to accommodate video content through reviewer consensus or independent scoring. DISCERN (Appendix B) measures two dimensions of information quality: reliability of the source about treatment options (items 1–8), and information about treatment options (items 9–15). We adapted the instrument to document the types of specific risks and benefits mentioned in the videos and omitted the item about overall assessment of quality. Each of the 15 items were ranked as "No", "Partially", and "Yes". To analyze the social norms disseminated through the videos, we formulated questions regarding social norms related to obesity known to be promoted by commercial actors (Brownell and Warner, 2009b; Moodie et al., 2013; Hirst and Turnock, 2024): 1) Obesity is an individual problem; 2) Pharmaceuticalization of obesity; 3) Normalization of the use of semaglutide; 4) Consulting a healthcare provider is not required; 5) Non-healthcare professionals recommend semaglutide. See table B.3 in Appendix B for questions used to analyze each norm.

Other meta-data obtained from videos included: date of publication, number of likes, forwards, comments, and length in seconds. We defined categories based on the voice in the videos as follows: healthcare professionals, layperson, professional communicators, non-medical coaches, and staff in commercial establishments. We used the self-reported titles, names and brief biographies of the users to infer their category. *Healthcare professionals* included physicians, nurses, nutritionists, and pharmacists. *Non-medical coaches* refer to people who are not healthcare providers and self-identified as coaches (i.e. wellness coach, food coach). The category *Staff in commercial establishments* was assigned to videos generated by a commercial entity, mostly pharmacies and wellness centers as inferred by their username.

4. Content analysis

To ensure robust and reliable assessments, we employed a multi-step process designed to minimize individual biases and improve the validity of our analysis. First, each video was randomly assigned to at least two members of the research team (BA, MR, VW and PAC) who independently evaluated its quality based on the predefined criteria (Supplementary material). Researchers could watch the videos as many times as

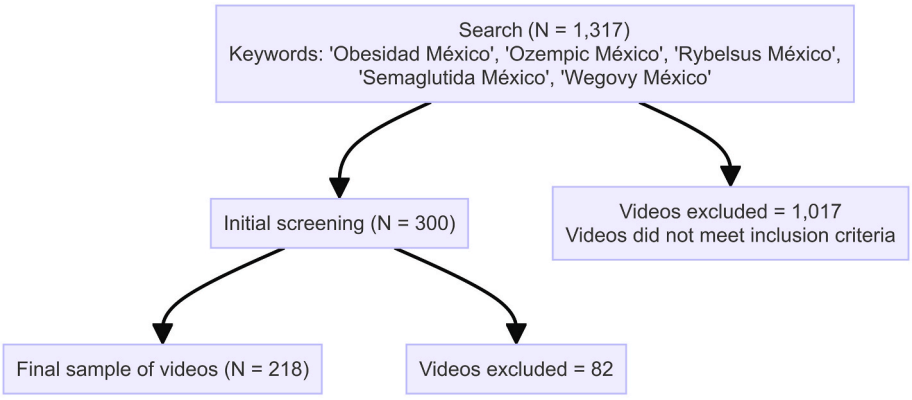

Fig. 1. Process for videos selection.

needed to fill out the adapted DISCERN instrument. By working independently, we aimed to reduce the risk of mutual influence during initial scoring; to reach consensus, discrepancies between initial evaluations were discussed pairwise. For videos where pairwise resolution was insufficient, the full research team reviewed the evaluations. This step ensured that persistent disagreements were resolved collectively, leveraging the team's diverse expertise and ensuring consistent application of the evaluation criteria. The analysis dataset contained video-level observations, with columns including the numeric representation of the adapted scale DISCERN items: 1 = "No"; 3 = "Partially"; 5 = "Yes". We created additive summary scores (overall, reliability, treatment options) following the original methodology. The range of possible values of the adapted DISCERN score was 15–75. We also created a measure for the level of interaction that videos receive from an audience called engagement rate, computed as total number of interactions (likes, shares, comments) divided by total number of views, and expressed as a percentage (Morales et al., 2022; Jancey et al., 2023).

We report mean, median, and standard deviation for continuous variables (e.g. number of views), proportions for the scale variables, and binary indicators for each benefit, risk, and social norms. Summary statistics are reported for the full sample and stratified by voice; differences in outcomes between voices were tested via regression analysis with heteroskedasticity-robust standard errors. We used the methodology used by Basch (2022) on the TikTok content analysis as our approach to analyze social norms and their potential popularity and engagement.

5. Results

Videos were classified according to the profile of the voice in the video (Table 1). The largest groups were healthcare professionals (56.0%) and laypersons (27.5%). Staff in commercial establishments accounted for 9.6%, non-medical coaches (4.1%), and professional communicators (2.8%). Collectively, the 218 semaglutide-related TikTok videos received 14,161,974 views over a period of 24 months. As shown in Table 1, mean (median) duration was 85 (71) seconds, 64,963 (11,750) views, 2119 (179) likes, 431 (22) shares, 65 (13) comments. The mean engagement rate was 3.1 interactions per video.

6. Poor quality of health information

The distribution of the DISCERN score was left-skewed (Fig. 2), implying low levels of quality; the exception was Professional communicators with no videos in the lowest range of the scale. Overall, mean adapted DISCERN score was 29.8 out of 75 points (Table 2). Videos posted by Professional communicators scored the highest (36.0), followed by Healthcare professionals (31.9); lowest-scoring voices were Staff in commercial establishments (25.5) and Layperson (26.7). Regression analysis using Healthcare professionals as reference and controlling for video duration – under the rationale that longer videos convey more information – showed that the lower mean scores for Layperson and Staff in commercial establishments were statistically significant at conventional levels. For the Non-medical coach category, only the Treatment choices score was significantly lower at the 10% level. Finally, the higher score in Professional communicators was not significantly different from Healthcare professionals; however, the *p*-values for this voice across scores lie between 0.10 and 0.20 despite the low sample size (n = 6).

Fig. 3 shows the distribution of our DISCERN items by voice. Overall, the lowest performing items were information regarding treatment risks, risks of no treatment, and information on alternative treatments. Regarding mentioning treatment risks, shared decision-making and alternative treatment options, healthcare professionals performed slightly better compared to other voices. Explaining treatment benefits scored consistently higher than explaining treatment risks across all voices except for professional communicators, who scored the highest in explaining risks.

We also find that videos with higher scores do not generate more interactions. While the bivariate relationship between the adapted DISCERN score and engagement is positive and statistically significant (*p*-value = 0.011), once we control for duration and the number of days elapsed between date of video posting and query date (video age) such relationship disappears, suggesting that engagement is driven by other video attributes rather than quality itself (see Supplementary material, Table B.3).

Table 3 shows how frequently risks and benefits were mentioned. About 1 in 4 videos mentioned common risks such as dizziness, fatigue, headache, or stomach problems (24.3%), and only 1 in 9 mentioned serious risks such as kidney damage, pancreatitis, thyroid tumors, or cancer (11.9%). Furthermore, 155 videos (71%) did not mention any risk related to the use of semaglutide (results not shown in table). Although Healthcare professionals ranked second lowest in explaining common risks (20.5%), they were the most likely to mention serious risks (17.2%). Across all voices, most videos mentioned weight control or appetite reductions as benefits of semaglutide, with 83% of videos overall. In contrast, benefits regarding medical indications, such as

Table 1
Characteristics of TikTok videos related to semaglutide in the analytical sample.

Main voice[a]	Duration *(seconds)*[b]	Engagement rate[c]	Views[d]	Likes[d]	Shares[d]	Comments[d]
	Mean ± SD; [Median]	Mean ± SD [Median]	Mean ± SD [Median]	Mean ± SD [Median]	Mean ± SD [Median]	Mean ± SD [Median]
Full sample N = 218	85 ± 63[71]	3.1 ± 2.2[2.6]	64,963 ± 225,223[11,750]	2,119 ± 8,105[179]	431 ± 2,106[22]	65 ± 176[13]
Healthcare professional N = 122 (56.0%)	86 ± 55 [75]	3.5 ± 2.1 [2.9]	79,065 ± 246,477[13,600]	2,759 ± 9,185[321]	618 ± 2,589[39]	80 ± 207[22]
Layperson N = 60 (27.5%)	93 ± 81[84]	2.4 ± 1.7[1.8]	42,944 ± 155,637[13,850]	1,446 ± 7,402[138]	93 ± 365[12]	49 ± 105[14]
Staff in commercial establishmen N = 21 (9.6%)	59 ± 57[38]	2.6 ± 3.7[1.8]	11,436 ± 22,417[2,640]	275 ± 647[23]	41 ± 90[5]	21 ± 42[2]
Non-medical coach N = 9 (4.1%)	70 ± 51 [57]	2.8 ± 1.4[2.7]	19,402 ± 31,111[5,217]	615 ± 1,278[73]	36 ± 64[10]	28 ± 7[5]
Professional communicator N = 6(2.8%)	83 ± 36[89]	2.7 ± 1.4[2.6]	254,107 ± 610,378[4,450]	4,531 ± 10,861[127]	1,968 ± 4,768[24]	154 ± 369[3]

Footnotes: Mean ± SD; [Median].
[a] Healthcare professionals include physicians, nurses, nutritionists and pharmacists. Non-medical coach refers to people who are not healthcare providers and self-identified as coaches (wellness coach, food coach).
[b] Duration refers to the total number of seconds without any transformation to minutes.
[c] Engagement rate is defined as total number of likes, shares, and comments divided by total number of views, and multiplied by 100.
[d] Data described represents the video metrics of the total sample and each voice respectively.

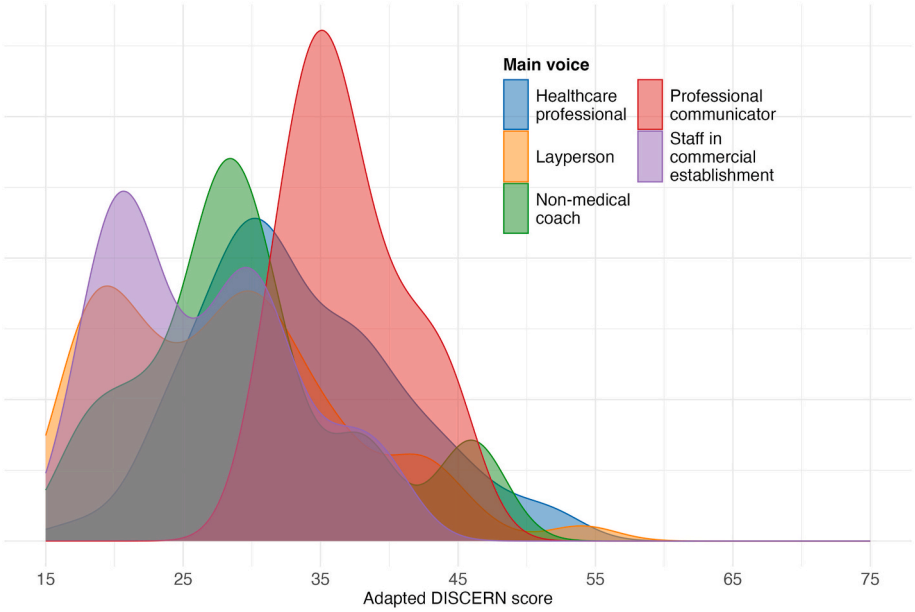

Fig. 2. Density plot of adapted DISCERN score, by main voice.
Footnotes: Probability density functions (pdf) smoothed with a Gaussian kernel and bandwidth = 2.5.

Table 2
Summary statistics of adapted DISCERN scores, by voice.

Main Voice	N	Adapted DISCERN	Reliability	Treatment choices
Overall	218	29.8	17.0	12.8
Healthcare professional	122	31.9	18.4	13.5
Layperson	60	26.7 ***	14.9 ***	11.7 ***
Staff in commercial establishment	21	25.5 ***	14.3 ***	11.2 **
Non-medical coach	9	27.9	16.9	11.0 *
Professional communicator	6	36.0	20.7	15.3

Footnotes: Section 2 of adapted DISCERN (treatment choices) consists of items 9 to 16 except for the overall assessment of quality. Asterisks denote statistical significance for the coefficients of voice from a linear regression where the reference category is Healthcare professionals: *** 0.01 ** 0.05 * 0.1.

diabetes control or protection against cardiovascular diseases were mentioned in 40.8% and 9.2% of videos, respectively.

Table 4 shows the frequency of social norms promoted in the videos and two proxies of their potential reach as measured by the share of total views and average number of views per month. Of the 218 videos, 85% did not mention the causes of obesity or the different solutions, and thus portrayed "obesity as an individual problem" by focusing only on actions at the individual level to "solve obesity". These videos reached on average 1,941,488 views per month. Fifty five percent of videos promoted the pharmaceuticalization of obesity by mentioning losing weight as its benefits but not mentioning the need to make lifestyle changes while using semaglutide. Also, 63% of videos did not mention the need to seek medical advice before using semaglutide, averaging 1,802,441 views per month and representing 75.1% of total views. Some videos detailed specific dosages used and offered to ship semaglutide at discounted rates. Normalization of using semaglutide with an average of 1,656,403 views was prevalent in 54% of videos. Finally, 16% of videos whose voice was non-healthcare professionals explicitly recommended the use of semaglutide, representing half of the videos where this norm was promoted (results not shown in Table 4).

7. Discussion

Our results show a high prevalence of both misinformation and dissemination of potentially harmful social norms, underscoring the need to improve oversight of social media platforms to mitigate potential public health risks. Videos often lacked critical information about risks and the necessity of consulting a healthcare provider. Even content from healthcare professionals – typically trusted voices in health communication (Yglesias-González et al., 2022)– failed to provide a balanced discussion of risks and benefits, address areas of uncertainty, or offer additional resources.

The normalization of prescription-only medicine is a public health concern. In our study, more than half of the videos normalize the use of semaglutide. We observed videos with laypeople detailing their dosage and demonstrating self-injections at home, in cars, and at work. The normalization of semaglutide as a feature of everyday life, combined with the lack of information on seeking medical advice, is alarming – especially given that 63% of videos omitted the need to consult a healthcare provider. US Food and Drug Administration (FDA) already warned people about overdosing on semaglutide due to self-administering incorrect doses or healthcare providers miscalculating dosages (FDA, 2024). Our study found some of the videos offered to ship semaglutide to people's homes at discounted prices; access to unregulated markets raises significant risks; buying drugs online without a prescription exposes people to unregulated, risky products. News media have reported on the consequences of omitting risk information on social media by reporting cases of adverse events in individuals who purchased semaglutide from friends (BBC, 2024).

Most TikTok videos analyzed frame obesity as an individual problem that requires pharmacological treatment. This narrative promotes obesity medicalization and pharmaceuticalization, reinforcing stigmatization, and discrimination based on appearance or behavior. By narrowly emphasizing individual solutions like medication use, this approach diverts attention from the broader social and commercial determinants of obesity, undermining more sustainable, structural interventions such as addressing socioeconomic inequality and regulating the ultra-processed food industry. Countries like Mexico and Brazil have faced persistent challenges in curbing the influence of ultra-processed food industries due to entrenched commercial practices and beliefs about individual responsibility (Gómez, 2021; Vandevijvere et al.,

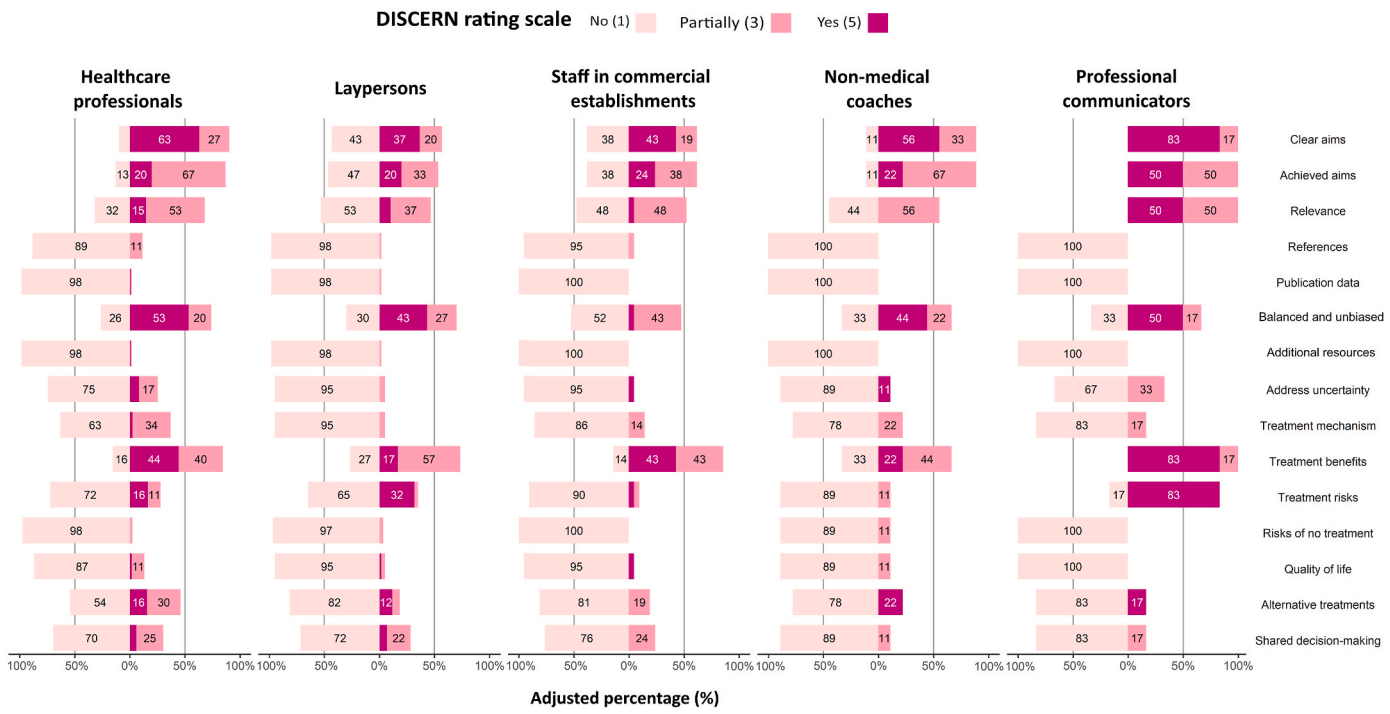

Fig. 3. Distribution of adapted DISCERN items, by voice (% of Likert).
Footnotes: Each bar represents the percentage of videos scoring on each Likert-scale level, with the score "Partially" centered and diverging outwards. Negative responses (i.e. "No") are shown to the left of the center line, while positive responses ("Yes") are shown to the right. Labels were applied only to values above 10% for clarity and the total percentage for each DISCERN item may not sum to 100% due to rounding. Vertical lines indicate the 50% mark.

Table 3
Summary of key characteristics mentioned in semaglutide-related TikTok videos.

Main voice	N	Mentions at least 1 common risk	Mentions at least 1 serious risk	Mentions as Benefits: Weight control OR reduce appetite	Mentions as Benefits: Diabetes control OR low glucose levels	Mentions as Benefits: HBP OR protect against cardiovascular diseases
Total	218	53 (24.3%)	26 (11.9%)	181 (83%)	89 (40.8%)	20 (9.2%)
Healthcare professional	122 (56%)	25 (20.5%)	21 (17.2%)	104 (85.2%)	60 (49.2%)	12 (9.8%)
Layperson	60 (27.5%)	21 (35%)	2 (3.3%)	47 (78.3%)	14 (23.3%)	2 (3.3%)
Staff in commercial establishment	21 (9.6%)	2 (9.5%)	1 (4.8%)	17 (81%)	9 (42.9%)	4 (19%)
Non-medical coach	9 (4.1%)	–	1 (11.1%)	7 (77.8%)	2 (22.2%)	–
Professional communicator	6 (2.8%)	5 (83.3%)	1 (16.7%)	6 (100%)	4 (66.7%)	2 (33.3%)

2023).

Our findings indicate that norms promoted by commercial actors, such as those framing obesity as a solely individual and medical problem, are also widely disseminated on TikTok in the context of semaglutide. These narratives not only shift responsibility away from systemic factors but also contribute to the normalization of pharmacological approaches as the primary solution to complex health challenges. The "pharmaceuticalization" of obesity aligns with the interests of industries and certain professional sectors rather than prioritizing population health.

The rapidly evolving digital marketing ecosystem exacerbates these issues, as industries may exploit platform dynamics to influence norms and consumer behavior, often circumventing existing regulatory efforts. To address these challenges, we recommend adopting future-proofed and robust regulatory policies designed to reflect the innovation of digital marketing while closing potential loopholes that industries might exploit. Regulatory frameworks should enforce stricter transparency for influencers and professional communicators, including disclosing funding sources. There is a shared responsibility of federal agencies regulating medicines, media, and legislators to address this issue. In the US, The FDA has recognized the need to better regulate advertisement of medication and medical products on social media (FDA, 2024) because there is a lack of transparency in financial relationships with commercial entities (Guégan et al., 2024). Although TikTok announced in May that it will ban dangerous content related to weight loss, experts are very skeptical that this self-regulation will be effective (Minsberg, 2024).

Additionally, professional associations free of conflict of interest can play an important role in creating compelling counter narratives that support the promotion of best public health practices and structural changes. Public health campaigns must emphasize the multifactorial nature of obesity and the importance of societal-level interventions levels (WHO, 2024a,b). Finally, a key strategy for addressing the spread of low-quality information on social media is to equip users with digital literacy skills, including the ability to recognize untrustworthy content and avoid being influenced by promotions of unnecessary products (FDA, 2024b, SOUK, 2024).

Finally, further research should examine the impact of these norms on behavior, explore demographic variations in message reception, and

Table 4
Observed social norms in 218 TikTok videos.

Social norms[a/]	Number (%)	Views	
		Share of total (N = 14,161,974) [b/]	Average per month [c/]
1. **"Obesity is an individual problem"** Do not mention causes of obesity nor solutions to obesity	185 (85%)	80.1%	1,941,488
2. **"Pharmaceuticalization of obesity"** Mention losing weight as a benefit AND no lifestyle changes needed while using semaglutide	120 (55%)	69.5%	1,373,484
3. **"Everyone is on semaglutide"** Normalize the consumption of Semaglutide	118 (54%)	68.4%	1,656,403
4. **"Consulting a healthcare provider is not required"** Do not suggest consulting a healthcare provider before using semaglutide	138 (63%)	75.1%	1,802,441
5. **"Non-healthcare professionals recommend semaglutide"** Explicitly recommends using semaglutide	34 (16%)	4.4%	140,213

Footnotes:
[a] Videos can disseminate more than one social norm.
[b] Data described represents the video metrics of the total sample.
[c] To calculate the average per month, we used the date where video was published between 2021 and 2023.

evaluate the effectiveness of public health policies in the digital space to safeguard public welfare. Another important area of investigation is the funding sources behind health-related social media content to identify potential biases and commercial influences. And finally, more research is needed to develop and refine methodologies and tools for effectively analyzing audiovisual content and identifying commercial practices.

8. Limitations

The selection of videos was influenced by the way TikTok's algorithm works. It is designed to show related content; a phenomenon commonly referred to as "echo chamber" which is an environment where a person only encounters information that reflects and reinforces their own. However, the selection of videos mirrors the experience a layperson may have when using the platform and, in this study, we were interested in looking at the quality of the information and social norms a person may be exposed to when using TikTok.

Another limitation is the data collection instrument we used. DISCERN was originally designed to evaluate written publication not short videos on social media and the questions we added have not been previously validated since semaglutide has only been marketed for weight loss for a few years and the body of research is still comparatively small. Regarding the categorization of voices, we used self-reported information to classify them, and this information could not be verified using information outside the TikTok platform.

Finally, we could not identify whether users or videos were sponsored by commercial actors. Studying the commercial determinants of health on TikTok is challenging due to the current limitations of TikTok's Transparency Center and limited regulation of social media spaces that permits this lack of transparency. TikTok has policies on misinformation, but videos lack explicit warnings about funding sources.

9. Conclusion

In conclusion, this study highlights critical lessons regarding the interplay between social media, health communication, and public health norms, emphasizing the urgent need for robust oversight of social media platforms. Addressing misinformation, harmful social norms, and the normalization of prescription-only medications like semaglutide is vital to mitigating public health risks. These issues demand action from federal agencies, legislators, professional associations and health professionals free of conflict of interest to protect people's health.

Equally important is addressing the commercial determinants of obesity, as industries leverage platform dynamics to shape public discourse and consumer behavior, often prioritizing profit over health. Future efforts should focus on enhancing digital literacy to empower users, developing counter-narratives that emphasize social and structural determinants of health, and creating regulatory frameworks capable of responding to the rapidly evolving digital marketing ecosystem. Continued research is needed to explore the impact of social norms, identify funding influences, and advance methodologies for analyzing audiovisual content. Together, these actions can safeguard public health and foster a more equitable approach to addressing complex health challenges.

CRediT authorship contribution statement

Paola Abril Campos-Rivera: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Conceptualization. **Berenice Alfaro-Ponce:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization. **Michelle Ramírez-Pérez:** Writing – review & editing, Investigation, Conceptualization. **Daniel Bernal-Serrano:** Writing – review & editing, Writing – original draft, Conceptualization. **David Contreras-Loya:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Formal analysis, Data curation. **Veronika J. Wirtz:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Conceptualization.

Ethics approval

Ethics approval for our manuscript is not required, as we analyzed secondary information.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2024.117646.

Data availability

Data will be made available on request.

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