Swipe, Share, and Mislead: The Digital Spread of Social Media Misinformation

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Disclosures

The planner(s) and speaker(s) have indicated that there are no relevant financial relationships with any ineligible companies to disclose.

Learning Objectives

At the end of this session, learners should be able to:

- Identify common sources and forms of health misinformation encountered in clinical practice
- Recognize the credibility of health-related claims using evidence-based tools and reliable information sources
- Outline a structured approach to correcting inaccurate patient beliefs while maintaining rapport and trust
- Locate trustworthy, patient-appropriate resources that support accurate health understanding and informed decision-making

Abbreviation Key

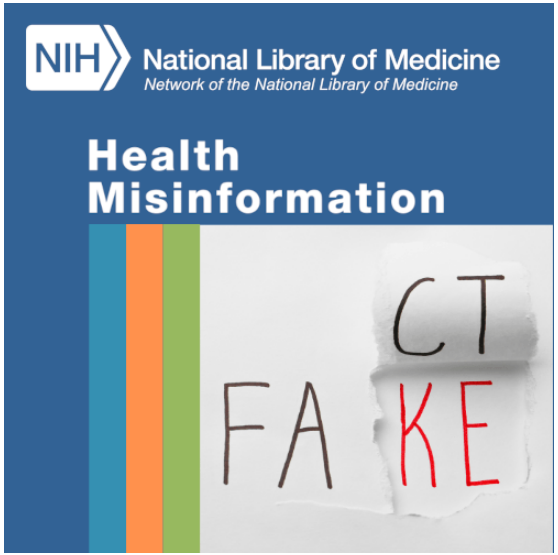
- AI = Artificial Intelligence
- AOR = Adjusted Odds Ratio
- API = Application Programming Interfaces
- ASHP = American Society of Health-System Pharmacists
- CDC = Centers for Disease Control and Prevention
- CI = Confidence Interval
- FAO = Food and Agriculture Organization
- FDA = Food and Drug Administration
- FTC = Federal Trade Commission
- GLP-1 = Glucagon-like peptide-1
- HINTS = Health Information National Trends Survey
- IARC = International Agency for Research on Cancer
- ICD-10 = International Classification of Diseases, 10th Revision
- JECFA = Joint Expert Committee on Food Additivies
- LLM: Large Language Models
- NCI = National Cancer Institute
- NHANES = National Health and Nutrition Examination Survey
- NIH = National Institutes of Health
- OR = Odds Ratio
- RR = Risk Ratio
- T2DM = Type 2 Diabetes Mellitus
- USP = U.S. Pharmacopeia
- WHO = World Health Organization

Outline

- How Social Media Drives the Spread of Misinformation
  - Recurring misleading claims
  - Risks, concerns, and real-world consequences
  - Overall impact on public health, trust, and clinical decision-making
  - Effective strategies for addressing it
- Types of Common Health Misinformation
  - Weight-loss medications (GLP-1s)
  - Dietary supplements
  - Cancer treatments and causes
- Artificial Intelligence

Definition

- Health misinformation refers to any health-related claim that is:
  - False
  - Inaccurate
  - Misleading



Office of the U.S. Surgeon General. A community toolkit for addressing health misinformation. U.S. Public Health Service; 2021. Accessed August 23, 2024. https://www.hhs.gov/sites/default/files/health-misinformation-toolkit-english.pdf
Grantmakers In Health. Health misinformation resources. Published March 4, 2024. Accessed April 19, 2026. https://www.gih.org/communications/health-misinformation-resources/

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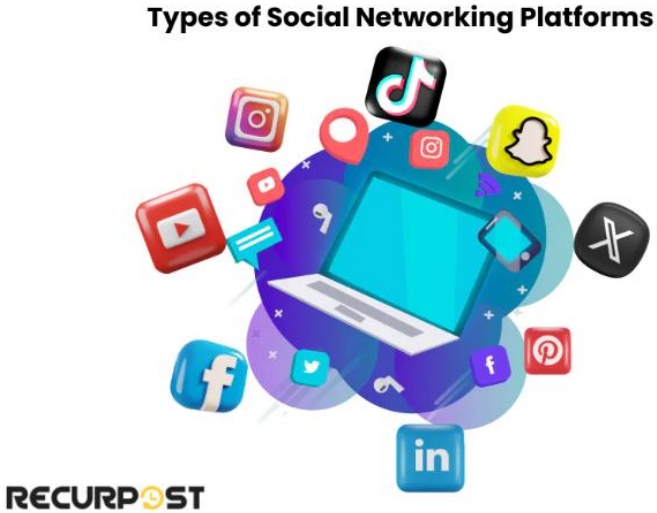
Types of Social Media

- Different social media platforms:
  - Facebook®
  - Instagram®
  - TikTok®
  - YouTube®
  - LinkedIn®
  - Reddit®



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Bizlink. Bizlink logo. Accessed April 8, 2026. https://fity.club/lists/suggestions/bizlink-logo/

Social Media

- Instant global information sharing
- High social media usage worldwide
- Rapid spread of misinformation threatens public health

Denniss E, Lindberg R. Social media and the spread of misinformation: infectious and a threat to public health. Health Promot Int. 2025;40(2):daaf023. doi:10.1093/heapro/daaf023
DataReportal. Global social media statistics. Accessed April 19, 2026. https://datareportal.com/social-media-users
Dreamstime. *Interact communicate illustrations & vectors*. Dreamstime. Accessed May 1, 2026. https://www.dreamstime.com/illustration/interact-communicate.html

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Global Scale of Social Media

Kepios tracks global digital engagement trends

October 2025 global social media report

- 5.66 billion social media user identities

DataReportal. Global social media statistics. Accessed April 19, 2026. https://datareportal.com/social-media-users

Impact of Social Media

- Social media strongly shapes individual:
  - Perceptions
  - Attitudes
  - Behaviors
- Misinformation and polarization undermine trust in health science

Denniss E, Lindberg R. Social media and the spread of misinformation: infectious and a threat to public health. Health Promot Int. 2025;40(2):daaf023. doi:10.1093/heapro/daaf023

Consequences

False or misleading health information on social media:

- Increasingly influences decision-making
- Puts individuals at risk

Rapid online spread of unproven or harmful product marketing:

- Influences consumer decision-making
- Promotes unsafe or ineffective health products
- Puts public health at risk

Denniss E, Lindberg R. Social media and the spread of misinformation: infectious and a threat to public health. Health Promot Int. 2025;40(2):daaf023. doi:10.1093/heapro/daaf023

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Misinformation Spreading

- Anyone can publish health claims online
- Accuracy not required for viral content
- Algorithms rapidly amplify misinformation globally
- Engagement and profit drive sensational health advice

Denniss E, Lindberg R. Social media and the spread of misinformation: infectious and a threat to public health. Health Promot Int. 2025;40(2):daaf023. doi:10.1093/heapro/daaf023

Technology Accelerating Misinformation

- Rapid digital innovation complicates misinformation management
- Platforms evolve faster than monitoring systems
- Regulations struggle to keep pace
- Public health responses lag behind technology

Denniss E, Lindberg R. Social media and the spread of misinformation: infectious and a threat to public health. Health Promot Int. 2025;40(2):daaf023. doi:10.1093/heapro/daaf023

Endorsements

- Disclose endorsements when money, gifts, or incentives are involved FTC requirement
- Look for clear labels: #ad, #sponsored, #paidpartner
- Paid likes, shares, or pins count as endorsements and usually require disclosure
- Fake or undisclosed endorsements are deceptive and subject to FTC enforcement

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Federal Trade Commission. FTC's endorsement guides: what people are asking. Updated June 29, 2023. Accessed April 13, 2026. https://www.ftc.gov/business-guidance/resources/ftcs-endorsement-guides-what-people-are-asking

Reliable Sources

- Start with trusted federal health agencies:
  - National Institutes of Health (NIH)
  - Centers for Disease Control (CDC)
  - Visit USA.gov to access all official U.S. government health resources in one place
  - MedlinePlus

National Institute on Aging. How to find reliable health information online. Published January 12, 2023. Accessed April 19, 2026. https://www.nia.nih.gov/health/healthy-aging/how-find-reliable-health-information-online

Reliable Sources

- The New England Journal of Medicine (NEJM)
- American College of Cardiology (ACC)
- Mayo Clinic
- Johns Hopkins Medicine
- Safe Medication

The New England Journal of Medicine. NEJM website. Accessed April 13, 2026. https://www.nejm.org
American College of Cardiology. ACC clinical guidelines and resources. Accessed April 13, 2026. https://www.acc.org
Mayo Clinic. Evidence-based health information and patient care. Accessed April 13, 2026. https://www.mayoclinic.org
Johns Hopkins Medicine. Health information and clinical education. Accessed April 13, 2026. https://www.hopkinsmedicine.org
Institute for Safe Medication Practices. *SafeMedication.com*. https://www.safemedication.com/. Accessed April 23, 2026.

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Assessment Question #1

When encountering health information or product recommendations online, which approach best helps a patient identify trustworthy content and ensure accurate understanding?

a) Assume recommendations are reliable if the post is popular or frequently shared

b) Trust health content that promotes products without describing financial relationships

c) Look for clear disclosure of paid endorsements (e.g., #ad, #sponsored, #paidpartner) and confirm the information using reputable, patient-focused sources (e.g., NIH, CDC, FDA, Mayo Clinic)

d) Rely on content that includes personal testimonials but no expert review

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GLP-1 Medications

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GLP-1

- GLP-1 Receptor Agonists
  - Initially developed for diabetes and obesity management
  - Mimic endogenous GLP-1 to enhance glucose-dependent insulin secretion
  - Delay gastric emptying, prolonging post-meal fullness
  - Decrease appetite, contributing to reduced caloric intake

Fong S, Carollo A, Lazuras L, Corazza O, Esposito G. Ozempic (glucagon-like peptide 1 receptor agonist) in social media posts: unveiling user perspectives through Reddit topic modeling. Emerg Trends Drugs Addict Health. 2024;4:100157. doi:10.1016/j.etdah.2024.100157
Found Health. How each GLP-1 works for weight loss. Found Health website. Accessed May 1, 2026. https://joinfound.com/blog/how-each-glp-1-works-for-weight-loss

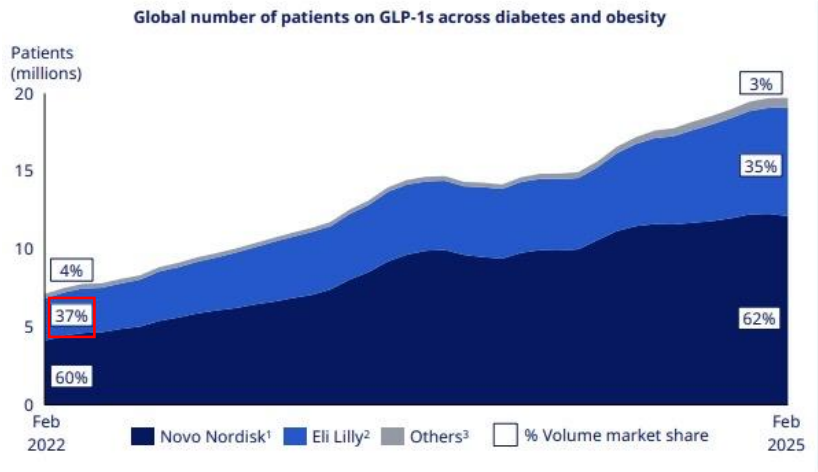
GLP-1 Approved for T2DM

- semaglutide (Ozempic®)
  - ≈$1200/month without insurance
- tirzepatide (Mounjaro®)
  - > $1500/month without insurance
- In Sept. 2022 insurers require FDA-approved ICD-10 codes for T2DM on GLP-1 prescriptions

Han SH, Safeek R, Ockerman K, Trieu N, Mars P, Klenke A, Furnas H, Sorice-Virk S. Public interest in the off-label use of glucagon-like peptide-1 agonists (Ozempic) for cosmetic weight loss: a Google Trends analysis. Aesthet Surg J. 2024;44(1):60-67. doi:10.1093/asj/sjad211

GLP-1 Off-Label Uses

- Media amplified off-label, cosmetic semaglutide use
- Demand surged rapidly nationwide
  - Novo Nordisk sales increased 37% in 2022
- Off-label use caused shortages for T2DM patients



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GLP-1 Approved for Obesity

- Adjunct to diet and exercise for obesity or overweight ≥ 1comorbidity
- semaglutide (Wegovy®)
  - ≈$1350/month without insurance
  - May be preferred in patients with established cardiovascular disease
- tirzepatide (Zepbound®)
  - > $1086/month without insurance

Fishbein S, et al. Wegovy cost without insurance in 2026: what you'll really pay. Noom. Published February 7, 2026. Accessed April 19, 2026. https://www.noom.com/blog/weight-management/wegovy-cost-without-insurance/
Honest Care. Zepbound cost 2026: how much with and without insurance. Published April 2026. Accessed April 19, 2026. https://www.findhonestcare.com/treatments/zepbound/cost/
Wolters Kluwer Health Inc. Semaglutide. Lexicomp. Accessed April 10, 2026. http://online.lexi.com
Wolters Kluwer Health Inc. Tirzepatide. Lexicomp. Accessed April 10, 2026. http://online.lexi.com

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TikTokfluence

Category	Details
Objective	Assess the quality, reliability, and themes of TikTok® videos related to GLP-1 receptor agonists
Platform Evaluated	TikTok®
Medications / Hashtags Analyzed	#Ozempic®, #Semaglutide, #Mounjaro®, #Tirzepatide
Sample Size	400 top-performing videos
Analysis Approach	Thematic analysis combined with quantitative scoring
Quality Assessment Tools	JAMA benchmarks and DISCERN criteria

Günaltay MM, Kartal N. TikTokfluence: the rise of GLP-1 receptor agonists in the age of social media health trends. J Am Pharm Assoc. 2026;103082. doi:10.1016/j.japh.2026.103082

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TikTokfluence

Category	Findings
Reliability	Increased comments (r = 0.13) and saves (r = 0.29), $p < 0.001$
Safety Risk Content	Modestly increased comments only (r = 0.13, $p < 0.001$)
Presentation Quality	Weakly associated with decreased comments (r = −0.12, $p = 0.02$)
Engagement Metrics	Views and likes were not associated with quality scores ($p > 0.05$)

Günaltay MM, Kartal N. TikTokfluence: the rise of GLP-1 receptor agonists in the age of social media health trends. J Am PharmAssoc. 2026;103082. doi:10.1016/j.japh.2026.103082

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TikTokfluence Conclusions

Category	Findings
Conclusions	• TikTok's algorithm prioritizes engagement over informational accuracy • There is a significant misinformation gap regarding GLP-1 receptor agonists

GLP-1 Frequency

- Reddit Data Analysis (April 2019–Dec. 2023)
  - Analyzed 46,491 posts:
    - r/ozempic
    - r/ozempicforweightloss
    - r/semaglutide
- Discussion frequency increased sharply from Oct. 2022 to Jan. 2023
  - By Jan. 2023, "Semaglutide & Weight-Loss Experiences" had become the most frequently discussed topic

Fong S, Carollo A, Lazuras L, Corazza O, Esposito G. Ozempic (glucagon-like peptide-1 receptor agonist) in social media posts: unveiling user perspectives through Reddit topic modeling. Emerg Trends Drugs Addict Health. 2024;4:100157. doi:10.1016/j.etdah.2024.100157

GLP-1 Media Amplification

- Media reports describe celebrity-driven Ozempic® parties and off-label use
- Entrepreneur endorsement brought Ozempic®/Wegovy® into spotlight
- Social media greatly amplified public awareness and interest
- #Ozempic generated massive engagement across TikTok and Instagram

Han SH, Safeek R, Ockerman K, Trieu N, Mars P, Klenke A, Furnas H, Sorice-Virk S. Public interest in the off-label use of glucagon-like peptide-1 agonists (Ozempic) for cosmetic weight loss: a Google Trends analysis. Aesthet Surg J. 2024;44(1):60-67. doi:10.1093/asj/sjad211

GLP-1 Cosmetic Use

- Increasing numbers of non-medical users take semaglutide (Ozempic®) without supervision for appearance-based weight loss
- Trend amplified by social media, news coverage, and celebrity endorsements

Fong S, Carollo A, Lazuras L, Corazza O, Esposito G. Ozempic (glucagon-like peptide-1 receptor agonist) in social media posts: unveiling user perspectives through Reddit topic modeling. Emerg Trends Drugs Addict Health. 2024;4:100157. doi:10.1016/j.etdah.2024.100157
Benefitfocus. GLP-1 drugs for weight loss: The good, bad and unknown. Benefitfocus website. Published September 4, 2025. Accessed May 1, 2026. https://www.benefitfocus.com/resources/blog/glp-1-drugs-weight-loss-good-bad-and-unknown

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GLP-1 Unapproved Versions

- Unapproved versions of GLP-1 medications do not undergo FDA review for:
  - Safety
  - Effectiveness
  - Quality
- Patients seeking these products for weight loss face risks from:
  - Unknown purity
  - Incorrect dosing
  - Lack of quality controls

Center for Drug Evaluation and Research. FDA's concerns with unapproved GLP-1 drugs used for weight loss. U.S. Food and Drug Administration. Accessed April 19, 2026. https://www.fda.gov/drugs/postmarket-drug-safety-information-patients-and-providers/fdas-concerns-unapproved-glp-1-drugs-used-weight-loss

GLP-1 Compounded

- FDA received complaints about compounded GLP-1 formulations
- Improper storage reported during shipping and handling
- Some compounded GLP-1s pose additional safety risks
- Fraudulent or misleading labeling identified
- Foreign-made ingredients used without FDA inspection

Center for Drug Evaluation and Research. FDA's concerns with unapproved GLP-1 drugs used for weight loss. U.S. Food and Drug Administration. Accessed April 19, 2026. https://www.fda.gov/drugs/postmarket-drug-safety-information-patients-and-providers/fdas-concerns-unapproved-glp-1-drugs-used-weight-loss

GLP-1 Quality Control

- FDA issued Import Alert 66-80 to block GLP-1 active pharmaceutical ingredients with quality concerns
- The agency is working with states and compounders to reduce risks from poor-quality, unapproved formulations

Center for Drug Evaluation and Research. FDA's concerns with unapproved GLP-1 drugs used for weight loss. U.S. Food and Drug Administration. Accessed April 19, 2026. https://www.fda.gov/drugs/postmarket-drug-safety-information-patients-and-providers/fdas-concerns-unapproved-glp-1-drugs-used-weight-loss
HealthyWomen. The truth about compounded GLP-1 drugs. HealthyWomen website. Accessed May 1, 2026. https://www.healthywomen.org/condition/the-truth-about-compounded-glp-1-drugs

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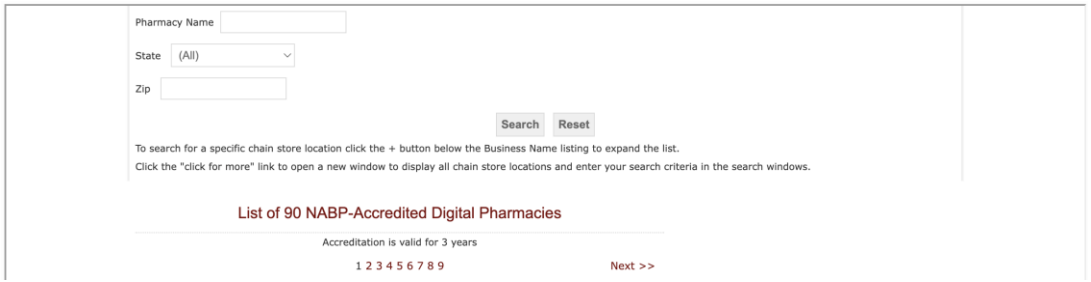
BeSafeRx

- FDA urges patients to obtain GLP-1 medications only with a prescription from state-licensed pharmacies
- BeSafeRx, the FDA's consumer education campaign, helps patients and health care professionals:
  - Identify safe and legitimate online pharmacies
  - Understand the risks of unsafe or unlicensed sellers
  - Protect health, privacy, and medication quality

U.S. Food and Drug Administration. BeSafeRx: your source for online pharmacy information. Accessed April 13, 2026. https://www.fda.gov/drugs/buying-using-medicine-safely/besaferx-your-source-online-pharmacy-information

Accredited Digital Pharmacies

- App-based pharmacies may lower medication costs
- Cost reductions may increase off-label use
- NABP accredits trusted digital pharmacies
- Accreditation ensures safety, quality, and access



Han SH, Safeek R, Ockerman K, Trieu N, Mars P, Klenke A, Furnas H, Sorice-Virk S. Public interest in the off-label use of glucagon-like peptide-1 agonists (Ozempic) for cosmetic weight loss: a Google Trends analysis. Aesthet Surg J. 2024;44(1):60-67. doi:10.1093/asj/sjad211
National Association of Boards of Pharmacy. Accredited digital pharmacies. Published May 16, 2025. Accessed April 19, 2026. https://nabp.pharmacy/programs/accreditations/digital-pharmacy/accredited-digital-pharmacies/

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Assessment Question #2

Which of the following is a common source of health misinformation encountered in clinical practice

a) National Institutes of Health (NIH) website
b) Peer-reviewed guidelines from professional societies
c) Viral social media posts, influencer content, and group chats
d) FDA medication labels

Supplements

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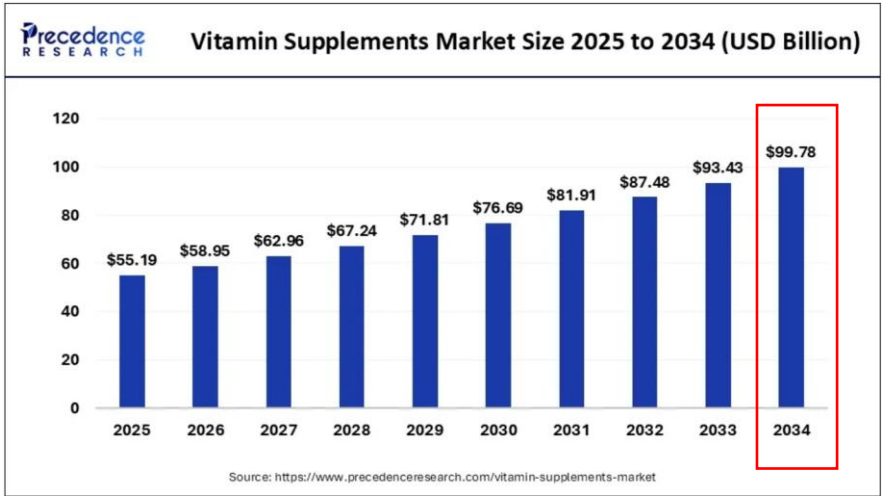
Market Growth

- Vitamin/mineral supplement market projected to reach
  - $99.7B by 2034, driven largely by online sales
- Growth fueled by rising interest in
  - Preventive health
  - Natural/organic products
  - “Immunity-boosting” claims



Proença M. Supplements and influencers, a dangerous combination. American Council on Science and Health. Published December 26, 2024. Accessed April 19, 2026. https://www.acsh.org/news/2024/12/26/supplements-and-influencers-dangerous-combination-49198

Precedence Research. Vitamin supplements market. Precedence Research website. Accessed May 1, 2026. https://www.precedenceresearch.com/vitamin-supplements-market

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Influencers

- Social media and celebrity endorsements strongly influence supplement purchasing trends
- Influencers and some clinicians promote supplements despite financial ties or weak evidence

Proença M. Supplements and influencers, a dangerous combination. American Council on Science and Health. Published December 26, 2024. Accessed April 19, 2026. https://www.acsh.org/news/2024/12/26/supplements-and-influencers-dangerous-combination-49198
Gufito. The impact of celebrity endorsements on consumer behavior. Medium. Published January 16, 2024. Accessed May 1, 2026. https://medium.com/@gufitodotcom/the-impact-of-celebrity-endorsements-on-consumer-behavior-23e63ab52f63

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Supplements Common Claims

Influencers also promoted supplements such as

- Collagen
- Detox teas
- Mitochondrial capsules

Industry spokesperson claimed experts gave informed, transparent opinions

Proença M. Supplements and influencers, a dangerous combination. American Council on Science and Health. Published December 26, 2024. Accessed April 19, 2026. https://www.acsh.org/news/2024/12/26/supplements-and-influencers-dangerous-combination-49198

Supplement Verification

- The USP provides a “finder tool” that lists verified dietary supplements containing only the ingredients stated on their labels
- In a review of 100 Instagram posts about nail, skin, and hair supplements:
  - Only 1 post included a *Supplement Facts* label
  - Only 4 posts came from verified accounts

Davila E. Social media endorsements and safe supplement consumption. Cornell Healthcare Review. Published December 19, 2025. Accessed April 19, 2026. https://www.cornellhealthcarereview.org/post/social-media-endorsements-and-safe-supplement-consumption
Zamil DH, Ameri M, Fu S, Abughosh FM, Katta R. Skin, hair, and nail supplements advertised on Instagram. Proc (Bayl Univ Med Cent). 2023;36(1):38-40. doi:10.1080/08998280.2022.2124767

Aspartame Concerns

- Aspartame overview
  - Artificial sweetener widely used since the 1980s in diet drinks, foods, and some medications
- Why reviewed
  - World Health Organization (WHO) and International Agency of Research on Cancer (IARC) routinely evaluate widely consumed substances for potential cancer hazards to protect public health

World Health Organization. Aspartame hazard and risk assessment results released. Published July 14, 2023. Accessed April 19, 2026. https://www.who.int/news/item/14-07-2023-aspartame-hazard-and-risk-assessment-results-released

Aspartame Concerns

- Key findings
  - IARC classified aspartame as possibly carcinogenic based on limited evidence, mainly for liver cancer
- Safety conclusion
  - WHO/FAO/JECFA reaffirmed the acceptable daily intake

World Health Organization. Aspartame hazard and risk assessment results released. Published July 14, 2023. Accessed April 19, 2026. https://www.who.int/news/item/14-07-2023-aspartame-hazard-and-risk-assessment-results-released
Perlmutter D. Aspartame—real concerns. Dr. David Perlmutter website. Published June 30, 2023. Accessed May 1, 2026. https://drperlmutter.com/aspartame-real-concerns/

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Aspartame Concerns

- WHO concerns sparked rapid spread of #SafetyofAspartame online
- WHO classified aspartame as possibly carcinogenic to humans
- Some dietitians dismissed warnings without disclosing industry sponsorship
- Investigation revealed American Beverage paid influencers to downplay risks

Proença M. Supplements and influencers, a dangerous combination. American Council on Science and Health. Published December 26, 2024. Accessed April 19, 2026. https://www.acsh.org/news/2024/12/26/supplements-and-influencers-dangerous-combination-49198
World Health Organization. Aspartame hazard and risk assessment results released. Published July 14, 2023. Accessed April 19, 2026. https://www.who.int/news/item/14-07-2023-aspartame-hazard-and-risk-assessment-results-released

FDA Regulations

- FDA action requires proof of imminent health hazard
- High legal threshold limits FDA supplement enforcement
- Standard first met banning ephedra in 2004
  - Ephedra linked to deaths from weight-loss and performance use

Klein JJ, Schweikart SJ. Does regulating dietary supplements as food in a world of social media influencers promote public safety? AMA J Ethics. 2022;24(5):E396-E401. doi:10.1001/amajethics.2022.396
Anderson RJ. *Ephedra: the good, the bad, & the banned*. The Pharmacologist. Accessed May 1, 2026. https://thepharmacologist.org/ephedra/

ADVOCATE HEALTH

Supplements Social Media Role

- Influencer marketing amplifies misleading supplement claims on social media
- Industry value grew rapidly from 2016 to 2021
- Some supplement brands abandoned traditional advertising entirely
- Majority of consumers rely on social media for purchases

Klein JJ, Schweikart SJ. Does regulating dietary supplements as food in a world of socialmedia influencers promote public safety? AMA J Ethics. 2022;24(5):E396-E401.doi:10.1001/amajethics.2022.396

NHANES Survey Study

Category	Details
Objective	Assess the prevalence and clinical characteristics of adult users of six potentially hepatotoxic botanical supplements
Data Source	NHANES 2017 – March 2020
Study Population	Nationally representative sample of 9,685 U.S. adults
Analysis Period	July 2023 – February 2024

Likhitsup A, Chen VL, Fontana RJ. Estimated exposure to 6 potentially hepatotoxic botanicals in US adults. JAMA Netw Open. 2024;7(8):e2425822. doi:10.1001/jamanetworkopen.2024.25822

NHANES Survey Study

Category	Details
Any Dietary Supplement Use	57.6% (95% CI, 55.9–59.4)
≥1 Hepatotoxic Botanical Use	4.7% (95% CI, 3.9–5.7)
Most Common Botanicals	Turmeric (n = 236); Green tea (n = 92); Ashwagandha (n = 28)
Higher Use Associated With	• Age 40–59 years (AOR 2.36; *P* = .04) • Age ≥60 years (AOR 3.96; *P* = .001) • Higher education (AOR 4.78; *P* < .001) • Arthritis (AOR 2.27; *P* < .001)

Likhitsup A, Chen VL, Fontana RJ. Estimated exposure to 6 potentially hepatotoxic botanicals in US adults.JAMA Netw Open. 2024;7(8):e2425822. doi:10.1001/jamanetworkopen.2024.25822

NHANES Survey Study

Category	Details
Conclusion	Use of potentially hepatotoxic botanicals is common and comparable to prescription hepatotoxic medication use
Clinical Implications	Due to limited regulatory oversight, clinicians should routinely screen for supplement use and monitor for liver-related adverse events

Likhitsup A, Chen VL, Fontana RJ. Estimated exposure to 6 potentially hepatotoxic botanicals in US adults.JAMA Netw Open. 2024;7(8):e2425822. doi:10.1001/jamanetworkopen.2024.25822

Journal of Adolescent Health

Category	Details
Objective	Evaluate the association between dietary supplement categories and severe adverse events in individuals aged 0–25 years
Study Design	Retrospective observational study
Data Source	FDA Adverse Event Reporting System (FAERS), 2004–2015
Study Sample	977 reports involving single-supplement adverse events
Comparator	Risk of severe medical events by supplement category compared with vitamins

Or F, Kim Y, Simms J, Austin SB. Taking stock of dietary supplements' harmful effects on children, adolescents, and young adults. J Adolesc Health. 2019;65(3):328-334. doi:10.1016/j.jadohealth.2019.03.005

Journal of Adolescent Health

Supplement Category	Relative Risk vs Vitamins
Muscle-building supplements	RR 2.7 (95% CI, 1.9–4.0)
Energy supplements	RR 2.6 (95% CI, 1.9–3.6)
Weight-loss supplements	RR 2.6 (95% CI, 1.9–3.4)

Or F, Kim Y, Simms J, Austin SB. Taking stock of dietary supplements' harmful effects on children, adolescents,and young adults. J Adolesc Health. 2019;65(3):328-334. doi:10.1016/j.jadohealth.2019.03.005

Journal of Adolescent Health

Category	Summary
Conclusion	Weight-loss, energy, and muscle-building supplements are associated with a significantly higher risk of severe adverse events in children, adolescents, and young adults
Implications	Stronger regulatory enforcement is needed to limit access and reduce preventable harm

Or F, Kim Y, Simms J, Austin SB. Taking stock of dietary supplements' harmful effects on children, adolescents,and young adults. J Adolesc Health. 2019;65(3):328-334. doi:10.1016/j.jadohealth.2019.03.005

Cancer Treatments and Causes

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Cancer Treatment Common Claims

A widely circulated online claim falsely promoted cannabis oil as a cure for:

- Metastatic lung cancer
- Aggressive breast cancer

Such misinformation can:

- Mislead vulnerable patients
- Delay evidence-based treatment
- Pose serious health risks

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Ben-Ari E. The challenges of cancer misinformation on social media. National Cancer Institute. Published September 9, 2021. Accessed April 19, 2026. https://www.cancer.gov/news-events/cancer-currents-blog/2021/cancer-misinformation-social-media

Mammogram Cancer Claims

- Comments that incorrectly asserted mammography causes or spreads cancer, including claims like:
  - “Do not get a mammogram if you have a lump, it may break and spread.”
  - “Mammograms are the leading cause of breast cancer!”
- Such misinformation can
  - Discourage essential screening
  - Delay diagnosis
  - Pose serious public-health risks

Loeb S, Langford AT, Bragg MA, Sherman R, Chan JM. Cancer misinformation on social media. CA Cancer J Clin. 2024;74(5):453-464. doi:10.3322/caac.21857
Basch CH, Hillyer GC, MacDonald ZL, Reeves R. Characteristics of YouTube™ videos related to mammography. J Cancer Educ. 2015;30(4):699-703. doi:10.1007/s13187-014-0769-9

Prostate Cancer Perceptions Study

Category	Details
Objective	Assess how primary information sources influence treatment experience and regret in prostate cancer radiation therapy
Study Design	Patient survey
Study Population	Patients with low- to favorable intermediate-risk prostate cancer
Treatment Modalities	Stereotactic body radiation therapy (SBRT), intensity-modulated radiation therapy (IMRT), high-dose-rate brachytherapy
Assessment Tool	Questionnaire evaluating decision-making, treatment experience, and treatment regret

Loeb S, Langford AT, Bragg MA, Sherman R, Chan JM. Cancer misinformation on social media. CA Cancer J Clin. 2024;74(5):453-464. doi:10.3322/caac.21857
Shaverdian N, Kishan AU, Veruttipong D, et al. Impact of the primary information source used for decision making on treatment perceptions and regret in prostate cancer. Am J Clin Oncol. 2018;41(9):898-904. doi:10.1097/COC.0000000000000387

Prostate Cancer Perceptions Study

Outcome	Findings
Worse-than-Expected Treatment Experience	39% of internet users vs 2–13% of non-internet users ($P < 0.01$)
Treatment Regret	43% of internet users vs 7–10% of non-internet users ($P < 0.01$)
Independent Predictors	• Internet as primary source independently predicted treatment regret (OR 46.5; $P < 0.001$) • Internet as primary source independently predicted poor treatment perception (OR 83.3; $P < 0.001$)

Loeb S, Langford AT, Bragg MA, Sherman R, Chan JM. Cancer misinformation on social media. CA Cancer J Clin. 2024;74(5):453-464. doi:10.3322/caac.21857
Shaverdian N, Kishan AU, Veruttipong D, et al. Impact of the primary information source used for decision making on treatment perceptions and regret in prostate cancer. Am J Clin Oncol. 2018;41(9):898-904. doi:10.1097/COC.0000000000000387

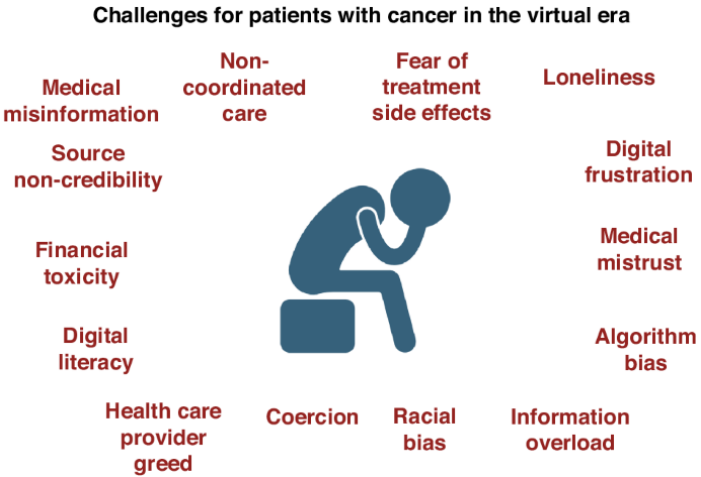
Prostate Cancer Perceptions Study

Category	Summary
Conclusion	Reliance on the internet as a primary information source was associated with significantly worse treatment experiences and higher treatment regret

Loeb S, Langford AT, Bragg MA, Sherman R, Chan JM. Cancer misinformation on social media. CA Cancer J Clin. 2024;74(5):453-464. doi:10.3322/caac.21857
Shaverdian N, Kishan AU, Veruttipong D, et al. Impact of the primary information source used for decision making on treatment perceptions and regret in prostate cancer. Am J Clin Oncol. 2018;41(9):898-904. doi:10.1097/COC.0000000000000387

Cancer Treatment Social Media Role

- Nearly one-third of popular cancer articles contained misinformation
- Most misinformation was harmful, posing risks to patients
- Social media cancer content often conflicts with medical expertise



Johnson SB, Parsons M, Dorff T, Moran MS, Ward JH, Cohen SA, Akerley W, Bauman J, Hubbard J, Spratt DE, Bylund CL, Swire-Thompson B, Onega T, Scherer LD, Tward J, Fagerlin A. Cancer misinformation and harmful information on Facebook and other social media: a brief report. J Natl Cancer Inst. 2022;114(7):1036-1039. doi:10.1093/jnci/djab141
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Twitter Misinformation Study

Category	Details
Objective	Examine whether exposure to Twitter misinformation affects knowledge and harm perceptions of e-cigarettes among cigarette smokers
Study Design	Online randomized controlled experiment
Study Period	November 2019
Study Population	2,400 adult U.S. and UK cigarette smokers who were non–e-cigarette users
Intervention	Participants viewed tweets portraying e-cigarettes as: as/more harmful than cigarettes, completely harmless, uncertain harms, or a control topic (physical activity)

Liu J, Wright C, Elizarova O, et al. Effects of brief exposure to misinformation about e-cigarette harms on Twitter on knowledge and perceptions of e-cigarettes. Digit Health. 2022;8:20552076221116780. doi:10.1177/20552076221116780

Twitter Misinformation Study

Category	Findings
Knowledge – Toxic Chemicals	“As or more harmful” tweets increased correct knowledge about toxic chemicals and formaldehyde ($p < 0.001$)
Knowledge – Comparative Risk	Reduced correct knowledge regarding absence of tar and lower toxin levels compared with cigarettes ($p < 0.001$)
Harm Perceptions	Significant increases in perceived harm across all diseases ($p < 0.001$)
Strongest Effect	Lung cancer harm perception ($\beta = 0.313$)

Liu J, Wright C, Elizarova O, et al. Effects of brief exposure to misinformation about e-cigarette harms on Twitter on knowledge and perceptions of e-cigarettes. Digit Health. 2022;8:20552076221116780. doi:10.1177/20552076221116780
Loeb S, Langford AT, Bragg MA, Sherman R, Chan JM. Cancer misinformation on social media. CA Cancer J Clin. 2024;74(5):453-464. doi:10.3322/caac.21857

Twitter Misinformation Study

Category	Summary
Conclusion	Brief exposure to misinformation worsened specific knowledge accuracy and inflated harm perceptions of e-cigarettes
Key Interpretation	“As or more harmful” misinformation had stronger effects than harmless or uncertain messages
Proposed Mechanism	Negativity bias, where negative information is more memorable and weighted more heavily in belief formation

Liu J, Wright C, Elizarova O, et al. Effects of brief exposure to misinformation about e-cigarette harms on Twitter on knowledge and perceptions of e-cigarettes. Digit Health. 2022;8:20552076221116780. doi:10.1177/20552076221116780
Loeb S, Langford AT, Bragg MA, Sherman R, Chan JM. Cancer misinformation on social media. CA Cancer J Clin. 2024;74(5):453-464. doi:10.3322/caac.21857

Sunscreen Cancer Claims

Category	Details
Objective	Examine the effects of video-based sunscreen misinformation on beliefs and behavioral intentions
Study Design	Experimental study
Study Population	1,348 participants
Intervention Groups	Participants viewed one of the following: • Misinformative sunscreen video • Sunscreen-promotion video • Control video

Loeb S, Langford AT, Bragg MA, Sherman R, Chan JM. Cancer misinformation on social media. CA Cancer J Clin. 2024;74(5):453-464. doi:10.3322/caac.21857
Vraga EK, Bode L, Tully M. Effects of a news literacy video and real-time corrections to video misinformation related to sunscreen and skin cancer. Health Commun. 2022;37(13):1622-1630. doi:10.1080/10410236.2021.1910165

ADVOCATE HEALTH

Sunscreen Cancer Claims

Outcome	Details
Belief in Sunscreen Myths	Increased belief after misinformation video ($p < .01$ vs control; $p < .001$ vs promotion)
Belief in Sunscreen Benefits	Reduced belief after misinformation video ($p < .01$ vs control; $p < .001$ vs promotion)
Intention to Use Sunscreen	Reduced intention to wear sunscreen compared with promotion video ($p < .01$)

Loeb S, Langford AT, Bragg MA, Sherman R, Chan JM. Cancer misinformation on social media. CA Cancer J Clin. 2024;74(5):453-464. doi:10.3322/caac.21857
Vraga EK, Bode L, Tully M. Effects of a news literacy video and real-time corrections to video misinformation related to sunscreen and skin cancer. Health Commun. 2022;37(13):1622-1630. doi:10.1080/10410236.2021.1910165

Sunscreen Cancer Claims

Category	Details
Conclusion	Video-based misinformation undermines accurate health beliefs and preventive intentions
Broader Implication	Social media health content can influence behavior either positively or negatively, depending on accuracy and presentation format

Loeb S, Langford AT, Bragg MA, Sherman R, Chan JM. Cancer misinformation on social media. CA Cancer J Clin. 2024;74(5):453-464. doi:10.3322/caac.21857
Vraga EK, Bode L, Tully M. Effects of a news literacy video and real-time corrections to video misinformation related to sunscreen and skin cancer. Health Commun. 2022;37(13):1622-1630. doi:10.1080/10410236.2021.1910165

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Cancer Treatment Overall Impact

Online health information empowers patients and self-care

Patients bear responsibility identifying accurate health information

Ben-Ari E. The challenges of cancer misinformation on social media. National Cancer Institute. Published September 9, 2021. Accessed April 19, 2026. https://www.cancer.gov/news-events/cancer-currents-blog/2021/cancer-misinformation-social-media

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Cancer Treatment Overall Impact

- HINTS, a national survey by the NCI, tracks how Americans access and use cancer- and health-related information
- In the 2019 survey (n = 5,438):
  - 84% used the internet; 86% of those engaged with social media
  - 41% watched health-related videos
  - 17% shared health information on social media
  - 9% participated in online support groups
- Female respondents were more likely to share health information (OR = 2.02; 95%CI: 1.34–3.01; p = .0013)
- Younger adults (18–24) were far more likely to share health information thanadults 65+ (OR = 5.68; 95% CI: 2.53–12.74; p < .0001)

Loeb S, Langford AT, Bragg MA, Sherman R, Chan JM. Cancer misinformation on social media. CA Cancer J Clin. 2024;74(5):453-464. doi:10.3322/caac.21857

Address Social Media Claims

- Pause before sharing; verify accuracy and source credibility
- If unsure or unverified, do not share
- Address misperceptions with curiosity and empathy
- Gently guide toward trustworthy, evidence-based resources

Office of the Surgeon General (US). Confronting health misinformation: the U.S. Surgeon General's advisory on building a healthy information environment. US Department of Health and Human Services; 2021. Accessed April 19, 2026. https://www.ncbi.nlm.nih.gov/books/NBK572168/

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Assessment Question #3

A patient tells you they saw a video claiming sunscreen increases cancer risk. What is the most appropriate first step to maintain rapport while correcting misinformation?

a) Tell them the video is wrong and not scientifically credible

b) Ask where they heard the information, listen to their concerns, and respond with empathy

c) Provide a long explanation of randomized controlled trial data

d) Advise them to stop using social media entirely

Artificial Intelligence

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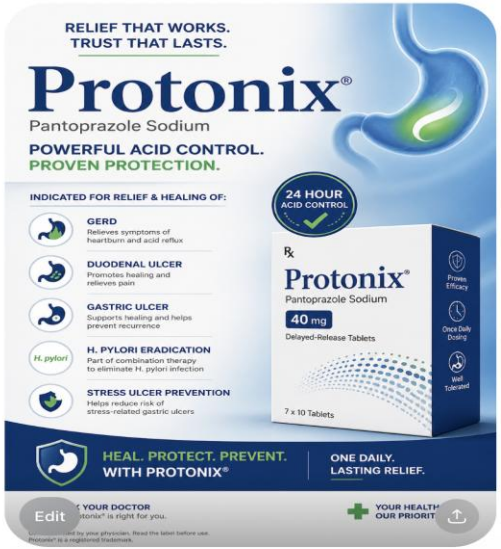
AI Example

ChatGPT

create a pharmacy poster for Protonix



ChatGPT. Response to user request regarding Protonix (pantoprazole) pharmacy poster. OpenAI; April 30, 2026. Accessed April 30, 2026. https://chat.openai.com/

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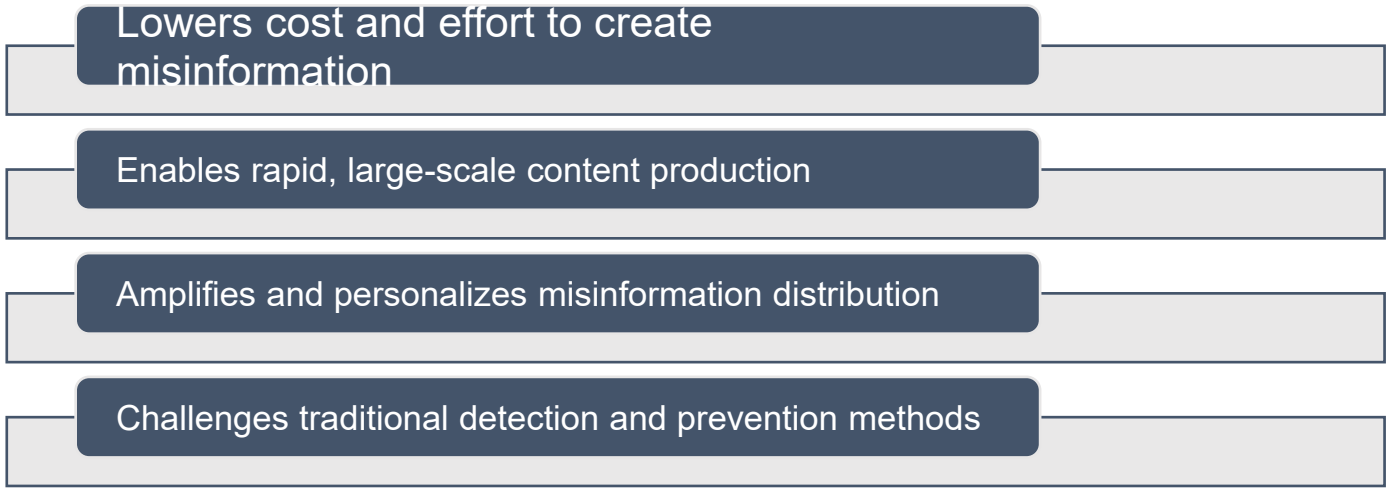
AI Concerns

- Compared to human-generated misinformation, AI:



Saeidnia HR, Jahani S, Ghiasi N, Keshavarz H. Generative AI and health misinformation: production, propagation, and mitigation—a systematic review. BMC Public Health. 2026;26(1):693. doi:10.1186/s12889-025-26148-9

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AI Concerns

- One public AI model generated 100+ disinformation posts quickly
- 17,000+ targeted words created in about one hour
- Content included fake testimonials and false scientific references
- Additional AI tools produced realistic images in minutes
- Weak safeguards enable rapid, scalable misinformation creation

Menz BD, Modi ND, Sorich MJ, Hopkins AM. Health disinformation use case highlighting the urgent need for artificial intelligence vigilance: weapons of mass disinformation. JAMA Intern Med. 2024;184(1):92-96. doi:10.1001/jamainternmed.2023.5947

AI Overall Impact

- AI-driven information demands constant ethical vigilance
- Ethical AI requires cross-sector collaboration
- Ethics protect information integrity
- Ethics strengthen societal resilience to misinformation
- Governance shapes AI trust and impact

Germani F, Spitale G, Biller-Andorno N. The dual nature of AI in information dissemination: ethical considerations. JMIR AI. 2024;3:e53505. doi:10.2196/53505

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AI Overall Impact

- Transparent training data enables independent AI evaluation
- Transparency helps identify bias and misinformation risks
- Open datasets reduce flawed AI outputs
- Regulation can support transparency standards
- U.S. AI regulation remains fragmented

Germani F, Spitale G, Biller-Andorno N. The dual nature of AI in information dissemination: ethical considerations. JMIR AI. 2024;3:e53505. doi:10.2196/53505
Congressional Research Service. Regulating artificial intelligence: U.S. and international approaches and considerations for Congress. CRS Report R48555. Published June 4, 2025. Accessed April 13, 2026. https://www.congress.gov/crs_external_products/R/PDF/R48555/R48555.2.pdf

AI Social Media Safeguards

Category	Details
Objective	Evaluate whether large language model (LLM) safeguards successfully block health disinformation and assess transparency of risk-mitigation processes
Primary Outcomes	Ability to block health disinformation prompts and resistance to circumvention (e.g., jailbreak attempts)

Menz BD, Kuderer NM, Bacchi S, Modi ND, Chin-Yee B, Hu T, Rickard C, Haseloff M, Vitry A, McKinnon RA, Kichenadasse G, Rowland A, Sorich MJ, Hopkins AM. Current safeguards, risk mitigation, and transparency measures of large language models against the generation of health disinformation: repeated cross-sectional analysis. BMJ. 2024;384:e078538. doi:10.1136/bmj-2023-078538

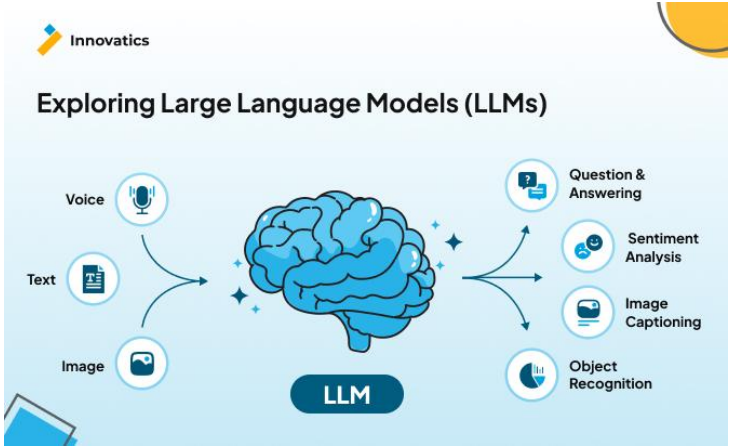
AI Social Media Safeguards

LLM	Findings
Claude 2®	Rejected all 130 disinformation prompts at both timepoints Remained resistant despite jailbreak attempts
Copilot®	Initially refused all disinformation prompts Became vulnerable at 12-week retesting
GPT-4 (ChatGPT®)	Routinely generated health disinformation
PaLM2® / Gemini Pro®	Routinely generated health disinformation
Llama 2®	Routinely generated health disinformation

Menz BD, Kuderer NM, Bacchi S, Modi ND, Chin-Yee B, Hu T, Rickard C, Haseloff M, Vitry A, McKinnon RA, Kichenadasse G, Rowland A, Sorich MJ, Hopkins AM. Current safeguards, risk mitigation, and transparency measures of large language models against the generation of health disinformation: repeated cross-sectional analysis. BMJ. 2024;384:e078538. doi:10.1136/bmj-2023-078538

AI Social Media Safeguards

- LLM safeguards reduce disinformation inconsistently across models
- Safety failure reporting systems often ineffective
- Patients should verify claims using trusted sources
- Regulation and transparency needed to reduce harm



Menz BD, Kuderer NM, Bacchi S, Modi ND, Chin-Yee B, Hu T, Rickard C, Haseloff M, Vitry A, McKinnon RA, Kichenadasse G, Rowland A, Sorich MJ, Hopkins AM. Current safeguards, risk mitigation, and transparency measures of large language models against the generation of health disinformation: repeated cross-sectional analysis. BMJ. 2024;384:e078538. doi:10.1136/bmj-2023-078538
Innovatics. *Large language models (LLMs): overview*. Innovatics website. Published June 25, 2024. Accessed May 1, 2026. https://teaminnovatics.com/blogs/large-language-models-llms-overview/

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Assessment Question #4

When evaluating a health claim seen on social media that may be AI-generated, which step best reflects using evidence-based reasoning to assess credibility?

a) Assuming the claim is accurate if it has many likes or comments
b) Checking whether the information is supported by reputable sources such as NIH, CDC, or other established medical organizations
c) Trusting the claim if the creator appears confident or well-spoken
d) Accepting the claim if it fits with your own past experiences

Conclusions

Health misinformation is widespread, driven by:

- Social media platforms
- Influencer-driven content
- Online forums
- Rapidly evolving technologies such as AI

Our role as healthcare professionals:

- Help patients recognize misinformation
- Model responsible information-sharing
- Direct patients toward trustworthy, science-based resources

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Questions?

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