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Editorial

Staying Informed in a Digital World: Artificial Intelligence, Misinformation, and Media Health Literacy in the Modern Era

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Digital media has become the core infrastructure of the contemporary health information ecosystem. AI's reach now extends across every layer of health promotion—from intelligent recommendation systems to behavioral intervention apps, from disease surveillance to personalized health education. Yet technological empowerment brings new risks: health misinformation spreads faster than accurate information, AI-generated content intensifies truth discernment difficulties, and public media health literacy lags behind the growing complexity of the information environment.

For the Middle East, this challenge is particularly urgent. Regional evidence indicates that e-health literacy among patients with diabetes is generally low, with over sixty percent at low levels, and e-health literacy is significantly positively correlated with self-care behaviors.[1] Among adolescents, e-health literacy is negatively associated with health anxiety.[2] Advancing digital health literacy is therefore not merely a global concern but a regional health promotion priority.

AI applications in health promotion are expanding rapidly. A rapid review of OECD countries found that AI-driven interventions focus primarily on dietary behavior (45%), smoking cessation (27%), physical activity (18%), and mental health (14%), mostly delivered as mobile applications.[3] These interventions report positive effects on acceptability, engagement, and health outcomes. AI's potential extends to identifying high-risk populations, enhancing disease surveillance, and enabling targeted public health communication.

However, AI is a double-edged sword. The same capabilities can generate and disseminate seemingly credible but harmful misinformation. Biases in AI systems may exacerbate health inequities—when training data lack representativeness, algorithmically recommended information may systematically neglect marginalized groups. Moreover, AI applications in misinformation detection face challenges of insufficient explainability and ethical dilemmas.[4]

The COVID-19 pandemic revealed the complexity of health misinformation. A systematic review proposed a conceptual framework deconstructing misinformation into six dimensions: sources, drivers, content, channels, target audiences, and health-related effects.[5] This framework moves beyond a simple true/false binary to treat misinformation as embedded in socio-technical systems. Emotional drivers, social identity, and algorithmic amplification jointly shape misinformation diffusion pathways. Individual-level correction often has limited effect—when beliefs are already entrenched, cognitive interventions struggle to gain traction.

Media health literacy is regarded as a crucial defense against misinformation. However, experimental evidence offers a cautious caveat. A randomized controlled trial with U.S. adults found that a health-specific media literacy intervention increased skepticism toward both inaccurate (5.6% decrease in endorsement) and accurate (7.6% decrease) cancer news, and accordingly did not improve accuracy discernment.[6] In contrast, a general media literacy intervention may significantly improve sharing discernment. This finding suggests that health-specific literacy interventions may induce excessive skepticism, and that "trusting accurate information" and "doubting false information" are two capacities requiring separate cultivation. Embedding literacy cultivation in everyday digital behavior contexts may prove more effective than one-off education.

Three priorities emerge for regional health promotion practice. First, e-health literacy should be placed at the core of the health promotion agenda. Regional studies consistently show robust associations between e-health literacy and self-management, health behaviors, and mental health.[1] Enhancing digital health literacy should be treated as infrastructure for chronic disease prevention, not a subsidiary goal. Second, AI applications must advance in tandem with information quality governance. The WHO

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African Region's Infodemic Response Alliance offers a replicable model—using AI-assisted analysis of localized misinformation trends while providing verified response resources.[7] Tanzania's validated national infodemic management strategy demonstrates that institutionalizing misinformation response is becoming a global trend.[8] Third, literacy interventions need "trust building" rather than mere "skepticism training." Programs should clearly distinguish cultivating misinformation identification ability from preserving trust in credible sources.[6]

Conclusion

The digital frontier is both an opportunity space and a misinformation breeding ground. AI makes this landscape more complex: it may enhance precision and reach, but may also accelerate false information production. The Middle East faces structural tension between inadequate e-health literacy and rapidly expanding digital health. Effective strategies should operate simultaneously at three levels: technological (transparency, fairness, and explainability of AI health tools), literacy (interventions balancing critical thinking with trust building, embedded in chronic disease management and adolescent health education), and governance (routine misinformation monitoring and response mechanisms incorporated into public health infrastructure). The core mission of health promotion is empowerment, not substitution—helping people navigate complex information environments while ensuring those environments are worthy of trust.

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