Think-Alouds and Results Assessment: A Study of Health Information Seeking Among People Who Use(d) Drugs

Jessalyn I. Vallade[a], Meghan L. Dowell[a]

[a] *University of Kentucky, 160 Patterson Drive, Lexington, KY, USA*

1. Introduction

According to the Substance Abuse and Mental Health Services Administration (SAMHSA, 2025), in 2024, 48.4 million people aged 12 or older had a substance use disorder (SUD), yet only 19% of those who needed it received treatment. Although overdose deaths in the United States have declined in recent years, they remain high, with the National Center for Health Statistics (NCHS, 2025) reporting 54,743 registered deaths in 2024. In addition to overdose and death, PWUD are at risk of many other adverse health outcomes, including co-occurring serious mental illnesses (SMI), viral infections (e.g., HIV, hepatitis), bacterial infections (e.g., skin and soft tissue infections, endocarditis), chronic pain, heart disease, and cancer (Attwood et al., 2025; Gomes et al., 2022; Langham et al., 2022; National Institute on Drug Abuse, 2024; SAMHSA, 2024). As a result, they often have complex medical and healthcare needs.

Despite these needs, people who use(d) drugs (PWUD) often avoid or delay accessing healthcare due to pervasive stigma and experiences of inequitable and substandard care (McCurry et al., 2025; Medina et al., 2022; Paquette et al., 2018). Further, healthcare is not designed to be patient-centered, highlighting the need for patients in general, and PWUD in particular, to enter healthcare interactions prepared to engage in self-advocacy to obtain the information and care they need. Health literacy can impact both the likelihood of seeking care (Attwood et al., 2025) and subsequent health outcomes. Knowledge and assertiveness can be important elements of recovery capital (Beaulieu et al., 2024), suggesting that the ability to enter healthcare interactions with existing knowledge and the confidence to advocate for themselves could bolster the social and recovery capital of PWUD.

People in recovery or actively usings drugs often turn to informal sources, such as peers or online communities when preparing for healthcare interactions.PWUD rely on digital health resources either through search engines or various online forums (e.g., Reddit). Due to algorithmically recommended health information sources on the internet, the reliability of health information and rampant spread of misinformation is a public health concern (Southwell et al., 2023 ; Swire-Thompson & Lazer, 2020). Health related misinformation is a serious and pervasive problem for the general public but especially PWUD because of the stigma they encounter when seeking healthcare (Alibudbud & Cleofas, 2023). Additionally, peer-to-peer sharing of information can lead to further spread of misinformation through trusted sources demonstrating levels of information poverty (Chatman, 1996).

The information seeking behaviors of PWUD searching for health-related information is understudied, and the limited available research is presented from the perspective of researchers in the field, not the end users (Sullivan & Shaw, 2023). Assessing and creating health information literacy interventions with and for PWUD requires the understanding of their health information needs (Dijkman et al., 2023). Therefore, this project directly addresses a critical gap by centering PWUD voices and experience in understanding health information seeking behaviors to create user-informed information literacy interventions that can combat misinformation, while respecting the lived realities and unique needs of this marginalized population.

We are investigating information seeking behaviors of PWUD to determine how information sources, like Google, successfully and appropriately support their information needs. The inclusion of AI overview in Google Search appears to have simplified several sources for seemingly faster information retrieval, however the overview hallucinates regularly and provides incorrect

SEASON 2026, September 15–17, 2026, Hamburg, Germany
DOI: https://doi.org/10.48441/4427.3713

information (Mickle et al., 2026). This is an opportunity for mis/disinformation to spread more quickly in an already vulnerable population with complex healthcare needs.

2. Methodology

This multiphase project begins with think-aloud interviews, exploring where and how PWUD seek information about salient health topics using fictional narratives. The first narrative described the symptoms of ulcerative colitis, the second sought harm reduction information, and the third outlined symptoms of infectious endocarditis. The potential health issues were derived from the literature and in discussion with a physician who treats PWUD. The process of a think-aloud allows the researchers to not only capture the search terms used but also the justifications around word choice and search engine (Branch, 2000). During the information seeking think aloud we recorded audio and the screen to be able to capture search terms, information choice decisions, and areas on the search engine results page (SERP) read or clicked. Chrome was cleared of all cookies and data prior to each interview.

The second phase uses the Result Assessment Tool (RAT) which was developed specifically for search engine researchers to be able to collect search results from the leading search engines. Using the search terms from the think alouds, researchers queried RAT to learn more about whether search engine optimization (SEO) techniques have been used and if the results overlap between search engines.

The third phase of this project will solicit expert feedback from healthcare providers about the relevancy and accuracy of SERPs produced in phase two utilizing RAT's built-in survey function. The survey will be distributed through Prolific to recruit a national representation of healthcare providers.

3. Preliminary Results

We conducted 30 in-person interviews at two recovery community centers in Lexington, Kentucky. The interviews ranged from 7 to 29 minutes. The average age was 45 years old, ranging from 22 to 70 years old.

Think Aloud

After participants heard and/or read each scenario, they were asked to search for information using the internet. Most chose to search via Google; other searches defaulted to Yahoo! due to the browser's default settings. Only two participants went directly to a generative AI chatbot (Gemini and ChatGPT), though the majority limited their attention to the AI overview in search results. Participants often went straight to diagnosing the character using their own lived experiences rather than searching the symptoms listed, focused exclusively on one symptom, or bypassed a search and would go straight to a medical professional or emergency room. Overall, we noticed low information literacy skills, including computer literacy. For example, participants did not differentiate from sponsored links and organic SERP. Additionally, participants often did not click on the links directly, but rather read from the two to three line summary of the website. With regard to computer literacy the first few participants had difficulty navigating to a browser which led the researchers to leave Chrome open for future participants and others did not know how to use a mouse.

Result Assessment Tool

The following are preliminary results of five search queries for scenario one.[2] Using RAT's Chrome extension, the first 10 organic results and AI overviews were scraped from Google. For the five searches we collected 64 standard links, five AI overviews, and 81 AI sources. We chose to rerun the collected search terms through RAT because not every participant used the AI overview and it was often quickly scrolled past.

The most glaring potential information quality issue is the high ranking of YouTube in the AI sources. As noted above, the majority of our participants did not explore information beyond the AI overview unless prompted by the interviewers asking them if they would click any of the links in the search results.

SEASON 2026, September 15–17, 2026, Hamburg, Germany
DOI: https://doi.org/10.48441/4427.3713

Healthcare Provider Feedback

We recently completed data collection with healthcare providers on the relevancy and accuracy of both the organic search terms provided by the participants and the RAT provided AI overviews. These results are forthcoming.

4. References

Alibudbud, R., & Cleofas, J. V. (2023). Global utilization of online information for substance use disorder: An infodemiological study of Google and Wikipedia from 2004 to 2022. *Journal of Nursing Scholarship*, *55*(3), 665-680. https://doi.org/10.1111/jnu.12844

Attwood, L. O., Schroeder, S. E., Vujovic, O., Stewardson, A. J., Doyle, J. S., Dietze, P., Higgs, P., & Colledge-Frisby, S. (2025). Qualitative analysis of barriers and facilitators to health engagement for people with injecting-related invasive infections using a social ecological framework. *Addiction, 120*, 2476-2488. https://doi.org/10.1111/add.70175

Beaulieu, M., Bertrand, K., Tremblay, J., Lemaitre, A., & Jauffret-Roustide, M. (2024). Personal strengths and resources that people use in their recovery from persistent substance use disorder. *Drugs: Education, Prevention and Policy, 31*(5), 570-583. https://doi.org/10.1080/09687637.2023.2247541

Branch, J. L. (2000). Investigating the information-seeking processes of adolescents: The value of using think alouds and think afters. *Library & Information Science Research*, *22*(4), 371-392.

Chatman, E. A. (1996). The impoverished life-world of outsiders. *Journal of the American Society for information science*, *47*(3), 193-206.

Dijkman, E. M., ter Brake, W. W. M., Drossaert, C. H. C., & Doggen, C. J. M. (2023). Assessment Tools for Measuring Health Literacy and Digital Health Literacy in a Hospital Setting: A Scoping Review. *Healthcare*, *12*(1), 11. https://doi.org/10.3390/healthcare12010011

Gomes, T., Kitchen, S. A., Tailor, L., Siyu, M., Murray, R., Bayoumi, A. M., Campbell, T., Young, S., & Kolla, G. (2022). Trends in hospitalizations for serious infections among people with opioid use disorder in Ontario, Canada. *Journal of Addiction Medicine, 16*(4), 433-439. https://doi.org/10.1097/ADM.0000000000000928

Langham, F. J., Curtis, S. J., Tang, M. J., Jomon, B., Doyle, J. S., Vujovic, O., & Stewardson, A. . (2022). Acute injection-related infections requiring hospitalisation among people who inject drugs: Clinical features, microbiology and management. *Drug and Alcohol Review, 41*, 1543-1553. https://doi.org/10.1111/dar.13525

McCurry, M. K., Avery-Desmarais, S., Schuler, M., Tyo, M., Viveiros, J., & Kauranen, B. (2023). Perceived stigma, barriers, and facilitators experienced by members of the opioid use disorder community when seeking healthcare. *Journal of Nursing Scholarship, 55*, 701-710. https://doi.org/10.1111/jnu.12837

Medina, S., Van Deelen, A., Tomaszewski, R., Hager, K., Chen, N., & Palombi, L. (2022). Relentless stigma: A qualitative analysis of substance use recovery needs assessment. *Substance Abuse: Research and Treatment, 16*, 1-15. https://doi.org/10.1177/11782218221097396

Mickle, T., Metz, C., Freedman, D., Terol, T. M., & Collins, K. (2026, April 7). How Accurate Are Google's A.I. Overviews? *The New York Times*. https://www.nytimes.com/2026/04/07/technology/google-ai-overviews-accuracy.html

National Center for Health Statistics. (2025, May 14). U.S. overdose deaths decrease almost 27% in 2024. CDC. https://www.cdc.gov/nchs/pressroom/releases/20250514.html

National Institute on Drug Abuse (2024, September). *Co-occurring disorders and health conditions*. National Institutes of Health. https://nida.nih.gov/research-topics/co-occurring-disorders-health-conditions#topic-5

Paquette, C. E., Syvertsen, J. L., & Pollini, R. A. (2018). Stigma at every turn: Health services experiences among people who inject drugs. *International Journal of Drug Policy, 57*, 104-110. https://doi.org/10.1016/j.drugpo.2018.04.004

SEASON 2026, September 15–17, 2026, Hamburg, Germany
DOI: https://doi.org/10.48441/4427.3713

Southwell, B. G., Otero Machuca, J., Cherry, S. T., Burnside, M., & Barrett, N. J. (2023). Health misinformation exposure and health disparities: Observations and opportunities. *Annual Review of Public Health*, *44*(1), 113-130. https://doi.org/10.1146/annurev-publhealth-071321-031118

Substance Abuse and Mental Health Services Administration. (2024, March 29). *Co-occurring disorders and other health conditions*. U.S. Department of Health and Human Services. https://www.samhsa.gov/substance-use/treatment/co-occurring-disorders#:~:text=CDC%20reports%20that%20in%202018,contracting%20and%20spreading%20hepatitis%20C.

Substance Abuse and Mental Health Services Administration. (2025). *Key substance use and mental health indicators in the United States: Results from the 2024 National Survey on Drug Use and Health* (HHS Publication No. PEP25-07-007, NSDUH Series H-60). Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. https://www.samhsa.gov/data/data-we-collect/nsduh-national-surveydrug-use-and-health/national-releases

Sullivan, M., & Shaw, G. (2023). The health information behaviors of people who inject drugs: A scoping review of the literature. *Journal of Documentation, 79*(6), 1502–1513. https://doi.org/10.1108/JD-07-2022-0153

Swire-Thompson, B., & Lazer, D. (2020). Public Health and Online Misinformation: Challenges and Recommendations. *Annual Review of Public Health*, *41*(Volume 41, 2020), 433–451. https://doi.org/10.1146/annurev-publhealth-040119-094127

SEASON 2026, September 15–17, 2026, Hamburg, Germany
DOI: https://doi.org/10.48441/4427.3713