Health Literacy Interventions Across the Cancer Continuum: an AI-Assisted Systematic Review

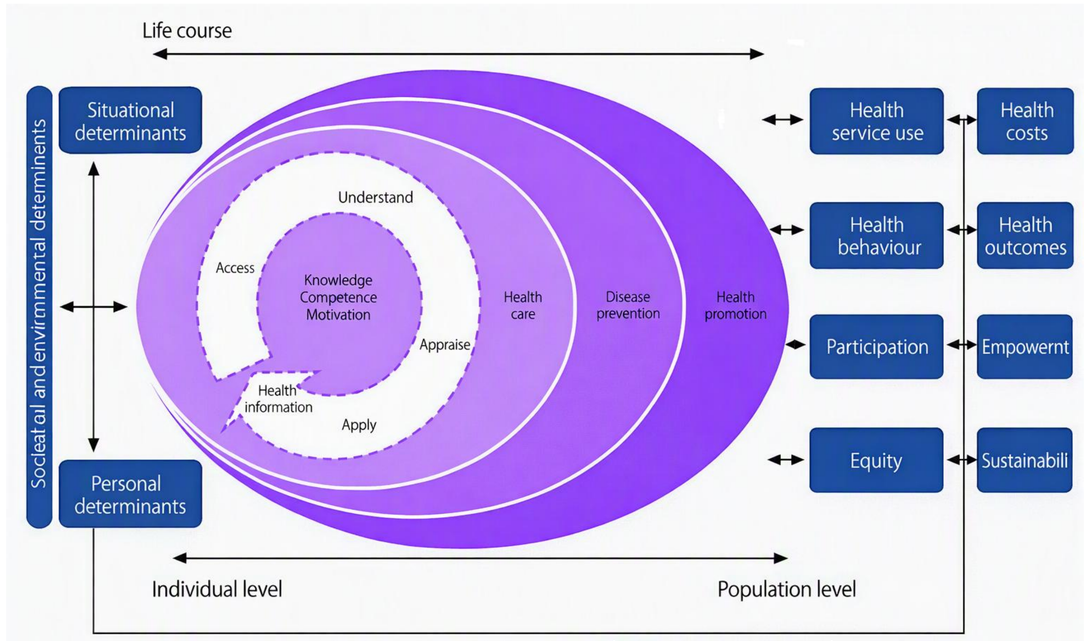
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BACKGROUND

Health Literacy is the capacity to obtain, process, understand and act upon health-related information to make informed decisions and maintain or improve health. It is central to Primary Care, yet cancer-related Health Literacy interventions are evaluated using heterogeneous designs, populations and outcomes, limiting evidence synthesis.

The iNTERVENE project (EU4Health, GA101219203) systematically reviewed this evidence following the Health Literacy Pathway Model.

By mapping interventions across the cancer continuum, the review identifies evidence gaps and opportunities to improve the design and evaluation of Health Literacy interventions.



Health Literacy Model Pathway (Edwards et al., 2012)

RESEARCH QUESTION

What is the effectiveness of health literacy interventions in cancer patients and/or caregivers and/or professionals and/or citizens throughout the cancer continuum on health literacy (HL)?

What tools are used to measure health literacy and other specific aspects of HL in accordance with the HL pathway model?

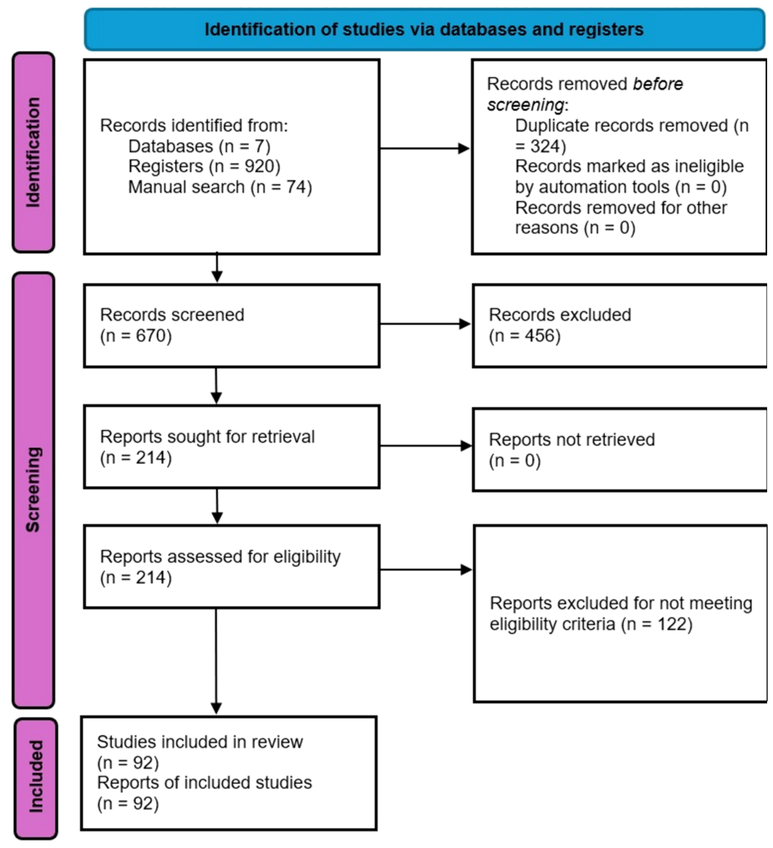
Which are the barriers and enablers influencing the effectiveness of interventions on health literacy?

METHOD

This PRISMA-compliant systematic review (PROSPERO: CRD420251165432), part of iNTERVENE (EU4Health, GA101219203), searched seven bibliographic databases (2006–2025) and manually screened reference lists for controlled trials and single arm studies of Health Literacy interventions in adults across the cancer continuum. Search strategies combined cancer-related, Health Literacy and intervention-related terms, adapted to each database's indexing system and syntax. No language restrictions were applied during the initial search.

Two independent reviewers screened titles and abstracts using Covidence. AI-assisted full-text data extraction and risk-of-bias assessment (RoB-2) followed a hybrid workflow with systematic human verification of every extracted field. Interventions were classified using the WHO International Classification of Health Interventions (ICHI).

Random-effects meta-analysis was planned where sufficient clinical and methodological homogeneity permitted; otherwise, findings were synthesized narratively. Certainty of evidence is being assessed using GRADE across Health Literacy, knowledge, self-efficacy and behavioral outcomes.



RESULTS AND DISCUSSION

57.6% (95% CI 47–67) of studies were from the USA, 64.1% (95% CI 54–73) focused mainly on people with cancer during active diagnosis/treatment, with interventions concentrated on detection/screening and treatment and targeting mainly **colorectal, breast and prostate cancer. 91.3% (95% CI 84–96) of interventions were predominantly educational and 68.5% (95% CI 58–77) were training-based**.

Health Literacy was assessed using both direct instruments and proxy outcomes**, with 17.4% (95% CI 11–26) overlap between approaches.** Among the 58 studies using direct measures, **69.0% (95% CI 57–79) used purpose-built, study-specific knowledge questionnaires**, whereas **13.8% (95% CI 7–25)** used validated instruments.

Knowledge was the most frequent target, and Health Literacy was often assessed alongside related constructs such as self-efficacy, highlighting the need for more consistent and comparable measurement.

Knowledge and self-efficacy showed the most consistent improvement, whereas effects on screening behavior were mixed. Most studies showed high risk of bias, largely due to limitations in participant/personnel blinding, a domain that is structurally difficult to satisfy in non-pharmacological interventions.

Comparisons across studies were limited by wide variation in interventions and outcome measures. Screening/early detection and active treatment were overrepresented, while survivorship, prevention and end-of-life care remained comparatively underexplored.

GRADE assessment of the Health Literacy has been completed to date, showing a Low certainty of evidence.

POINTS FOR DISCUSSION

Can hybrid AI–human workflows become a solid alternative to conduct systematic reviews optimizing time and resources?

Should the use of standardized Health Literacy instruments be prioritized over study-specific scales in future trial design, at the cost of losing specificity?

How can the knowledge gathered regarding Health Literacy measurement and assessment be translated into daily practice?

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