

Title: A narrative systematic review of effectiveness and acceptability of interventions to improve readability of patient healthcare materials

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Abstract

Objectives: Reading age is a key component of Health literacy (HL) yet many written healthcare materials in the UK exceed recommended reading levels, making them less accessible to much of the population. Creating barriers to understanding contributes to health inequalities. Simplifying the way information is written and terminology used could be a useful and low-cost approach to support HL, yet effectiveness of such interventions remains unclear. This study aims to systematically review evidence evaluating the effectiveness and acceptability of healthcare material readability interventions in high income countries.

Study Design: Narrative systematic review.

Methods: Searches of CENTRAL, Embase, MEDLINE, CINAHL, ERIC, APA Psych Articles, and Psychology and Behavioral Science, databases from 2014-2024 were conducted. Articles title/abstract and full text were double screened. Eligible studies examined tailored or improved written healthcare materials across clinical specialities. Data extraction included study characteristics, and interventions', impact on patient acceptability, comprehension and health outcomes. The Mixed Methods Appraisal Tool (MMAT) was used for critical appraisal.

Results: Thirty studies were included, predominantly from the USA. The majority evaluated interventions using simplified language, structured formatting, or visual enhancements. Findings indicated that simplified content was associated with greater patient understanding and preference. However, evidence on behavioural adherence and direct health outcomes was mixed, with few studies demonstrating statistically significant improvements. Quality of included studies was generally low, with methodological and reporting limitations.

Conclusions: Readability interventions can enhance patient comprehension and acceptability, yet their long-term impact on health outcomes remains uncertain. Future research should assess sustained effects and explore routine implementation in healthcare settings to inform best practices.

Key words: Health literacy, Readability, Reading age, Patient Information, Healthcare Communication

1. Introduction

Reading age refers to the level of literacy needed to understand written text, typically expressed in terms of the expected reading ability of a school-aged child¹. In the UK, the average adult reading age is estimated to be 9 to 11 years old, with one in six adults having a reading age of 5-7 years². Yet healthcare information is often written at a level exceeding this, typically at ages 11–14 years³. This can act as a significant barrier to comprehension and engagement and disproportionately affects individuals with lower health literacy, deepening existing health inequalities⁴. Reading age is a key component of health literacy (HL), which is a recognised determinant of health⁵, with lower HL associated with increased incidences of chronic illnesses, riskier health behaviours, lower use of preventive care^{6,7}, and higher mortality rates, particularly in older populations^{8,9}.

A simple and cost-effective strategy for improving HL and reducing structurally driven inequalities, may be the adaptation of patient healthcare materials to enhance readability and accessibility. Readability refers to how easy a piece of written text is to read and understand. It is usually assessed using formulas that estimate reading level, based on sentence length, word complexity, and structure¹⁰. While readability is a helpful indicator, it is only one part of health literacy, which involves not just the ability to read, but also to understand, evaluate, and apply health information in everyday life¹¹. Likewise, for health information to be effective, it should be tailored to the needs of specific audiences and culturally relevant to the communities they serve¹². Factors such as emotional tone, representation, and mode of delivery can shape how information is received and trusted¹³.

Various strategies have been used to create patient information materials that enhance readability by using plain language and simplified text structures, making them easier for diverse populations to understand and act upon¹⁴. Systematic reviews have played a valuable role in assessing readability of healthcare materials, using objective metrics such as the Flesch-Kincaid and Simple Measure of Gobbledygook (SMOG) indices to measure text complexity¹⁵. While these assessments provide important insights into whether content meets recommended readability levels, they do not fully capture how these materials function in real-world clinical settings or how they are perceived by patients and healthcare providers.

Existing literature evaluating user perspectives, often evaluated patient or provider perspectives in isolation, failing to capture the combined impact of readability modifications on both user acceptability and provider utility¹⁶. It is recognised that involving users in the design process, through co-production or user testing, can further enhance relevance and usability¹⁷. Likewise, while some reviews have focused on specific document types, such as

discharge summaries or over-the-counter medication leaflets, these assessments remain somewhat detached from the broader clinical experience and support systems users rely on to manage their health. These materials are often accessed outside of clinical settings, at home or in the community, where professional support is not available. In these unsupported contexts, clarity and usability become especially important, as service users and carers may need to rely on the written information alone. There is a lack of comprehensive evaluations addressing everyday information materials that service users routinely use, challenging their usefulness, integration into clinical workflows, and effectiveness in supporting long-term health management^{18–20}. Furthermore, interventions to improve readability often include multiple components, such as provider support and content design which makes it difficult to isolate the specific effect of readability changes, limiting interpretations of effectiveness

It is essential to understand what interventions are in place, that tailor or improve readability of healthcare information. This systematic review aims to assess the acceptability, and effectiveness of readability-focused interventions on patient healthcare materials, within clinical settings, incorporating perspectives from both service users and healthcare providers to inform best practice.

2. Methods

A narrative systematic review was conducted to synthesise evidence on the effectiveness and acceptability of interventions designed to improve the readability of patient-facing healthcare content. The review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines²¹.

2.1 Study selection

Eligible studies included peer-reviewed original research conducted in high-income countries and published between 2014-2024. This timeframe was chosen to capture research published post the United Nations General Assembly guidance to advance HL²². Included studies examined patient healthcare information improved for readability, in a broad range of patient-facing materials relating to clinical care, such as leaflets, letters, factsheets and digital information sheets provided before, during, or after clinical encounters. Included studies focused on patient materials designed to support clinical care, including information about diagnoses, treatments and procedures. Materials solely aimed at general health promotion or lifestyle advice, such as public health campaigns, were excluded to maintain a clear focus on content directly linked to healthcare interactions.

Studies that solely evaluated measurements of readability were excluded. Included studies involved service users or healthcare providers (18+) in developing or reviewing materials across multiple settings. Outcomes qualitatively or quantitatively, investigated acceptability and effectiveness in terms of improved healthcare materials

In this review, acceptability is understood as users' perceptions of how relevant and usable the material is, shaped by tone, representation, and overall fit with their needs and context. Effectiveness is understood to include outcomes such as improved comprehension, knowledge, and confidence, along with broader impacts like engagement, emotional response, and, in some cases, behaviour change. Readability interventions may contribute to behaviour change by supporting understanding and confidence but are not assumed to drive change on their own (Supplementary Material 1).

2.2 Search strategy

Search strategy was devised in Embase (Ovid) (Supplementary materials 2) using Population, Intervention, Comparison and Outcome (PICO) to optimise study identification. This was translated into CENTRAL (via Cochrane Library), MEDLINE (Ovid), CINAHL (EBSCO), ERIC (EBSCO), APA Psych Articles (ProQuest), and Psychology and Behavioral Science (EBSCO) (Supplementary Material X). Databases were selected for their multidisciplinary subject coverage of public health, medicine, psychology, and health education. The searches were performed in June 2024

Identified articles were screened and duplicates removed using Covidence. Two reviewers independently screened titles and abstracts with conflicts resolved by a third reviewer. Remaining articles were sought for retrieval and available articles were independently full text screened by two reviewers. Conflicts were discussed and consensus reached. Following full text screening, included articles were citation screened, and eligible articles were included (Figure 1).

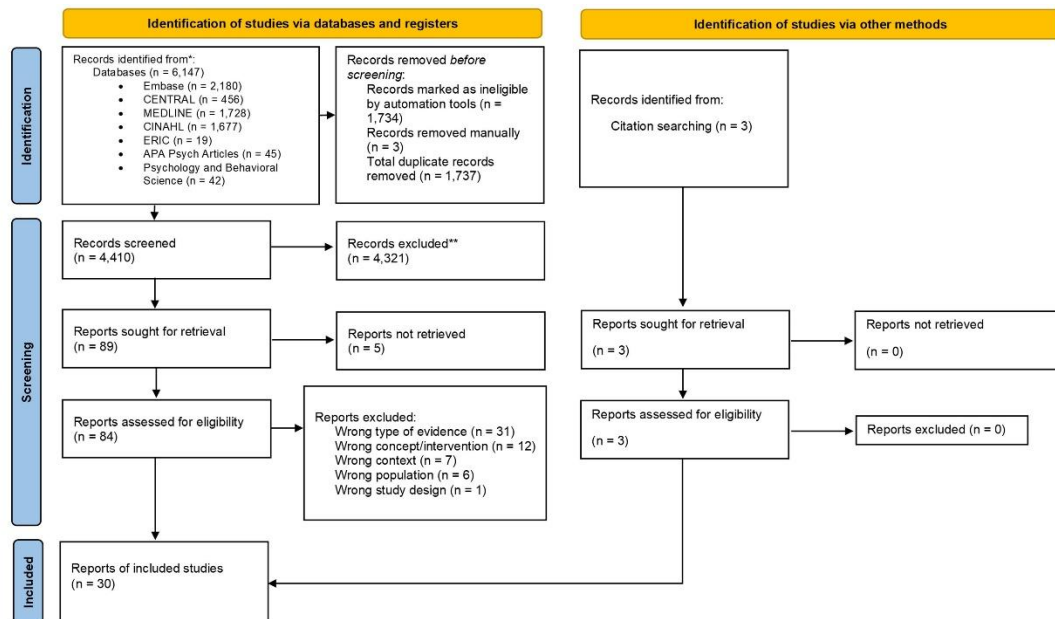


Fig. 1. PRISMA flowchart²¹

2.3 Quality Appraisal

The Mixed Methods Appraisal Tool (MMAT)²³ was used to assess the included studies' quality due to its suitability for appraising qualitative, quantitative, and mixed-methods studies. Three reviewers independently appraised studies. Higher scores indicate higher study quality, although MMAT authors also recommend considering the individual components. Quality ratings for each paper were generated (See supplementary material 3).

2.6 Data Extraction and Synthesis

Data were extracted (See supplementary material 4) on study characteristics, including author, year, country, study design, population, intervention type, and outcome measures, along with key findings related to health outcomes. After the data were tabulated, studies were organised into groups to identify similarities and differences in intervention types and outcomes, aiding early pattern recognition²⁴. Thematic analysis was then inductively applied to identify recurring concepts across the studies²⁴. Themes were then narratively synthesised to summarise the study findings²⁴. Statistical meta-analysis was not feasible due to the studies heterogeneity²⁴.

3. Results

3.1 Study Characteristics

Thirty studies reporting on effectiveness or acceptability of interventions to improve readability of patient healthcare information were included. Twenty-three used quantitative and seven mixed methods. Studies were conducted in the US (17)^{25–41}, Australia (2)^{42,43},

Canada (2)^{44,45}, Germany (2)^{46,47}, New Zealand (2)^{48,49}, Austria (1)⁵⁰, Denmark (1)⁵¹, Malta (1)⁵², Spain (1)⁵³, and Switzerland (1)⁵⁴.

3.2 Narrative synthesis

The narrative synthesis is organised into three key themes: strategies for revising or developing healthcare materials, acceptability of tailored patient healthcare materials, and the impact of these interventions on health outcomes.

3.2.1 Strategies for revising or developing Healthcare Materials

Interventions aimed at improving readability of patient healthcare materials spanned diverse clinical contexts such as cancer screening, emergency care, genetic counselling, and medication adherence. The primary focus was on enhancing readability, usability, and engagement through structured revisions of materials in various formats, including brochures (4)^{34,40,48,53}, letters (10)^{28,36–39,43,46,49–51}, leaflets (10)^{26,27,30,31,41,42,44,47,52,54}, information pages (4)^{29,32,33,45}, webpages (1)³⁵ and electronic health records (1)²⁵. Materials covered: discharge information (9)^{29,33,35,39,42,43,46,50,51}, screening information (6)^{26,27,31,36,37,40}, disease education (9)^{30,34,38,41,44,47,48,53,54}, procedures (4)^{32,45,49,52}, welcome letters (1)²⁸ and medication instructions (1)²⁵.

Readability assessments were applied in 19 studies to evaluate materials' complexity and guide any necessary changes. Common readability formulas included Flesch-Kincaid Grade Level and Flesch Reading Ease (12)^{28–30,32,36,37,40,41,47,49,52,54}, SMOG (4)^{42,44,45,48}, Gunning Fog Index (1)⁴⁸, Fry Graph (1)⁴⁸, Automated Readability Index (1)⁴⁴, The Health Literacy Advisor' software (1)³⁴ and a bespoke readability tool (1)⁴². Some studies consequently modified existing materials, using readability scores to shorten sentences, replace jargon and restructure information for better flow (11)^{25,26,28,29,32,36,37,41,45,48,49}. Others focused on developing new patient materials, ensuring that documents were written at an appropriate readability level from the onset (8)^{27,30,34,40,44,47,52,54}.

Seven studies used suitability assessments to consider broader factors, such as layout, content clarity, visual appeal, engagement, and cultural relevance to serve the target audience⁵⁵. Of these, four studies^{41,45,48,53} used the Suitability Assessment of Materials (SAM) tool to evaluate materials. In addition to SAM, the Health Education Materials (HEM) questionnaire was used to refine an educational booklet for promoting healthy lifestyles⁵³. The Health Literacy Universal Precautions Toolkit was applied in two US studies to revise medication instructions and brochures for older adults^{32,40}.

Both professionals and service users contributed to the development of healthcare materials. HL experts guided early revisions in two studies evaluating readability and design consistency in patient educational brochures and leaflets^{32,39}, while clinicians ensured content aligned with clinical workflows and patient education needs, particularly in the creation of discharge instructions and condition-specific patient education

materials^{29,34,35,39,42,43,46,50}. Likewise, service users and family advisory groups helped shape content to better reflect patient needs and preferences, contributing to wording, structure, and design choices before finalisation^{39,40}. Users provided feedback through structured interviews^{41,52 34,46} to ensure clarity and engagement.

3.2.2 Acceptability of Tailored Patient Healthcare Materials

Qualitative and quantitative findings consistently noted that service users and healthcare providers preferred simplified, structured materials over unmodified versions. With preferences assessed through direct comparisons between original and revised materials, examining factors such as clarity, ease of reading, helpfulness, and overall value^{36,42,44,45,48}. Notably, a U.S.²⁸ study reported that a revised neurology patient letter scored significantly higher in perceived overall value, with more users describing it as “very valuable” compared to the original version. Similarly, a study minimising medical terminology in secondary care correspondence⁴⁹ found that 70% of participants felt that the revised outpatient letter improved their doctor's professionalism, while 69% said it positively influenced their relationship with their GP. Qualitative feedback suggested that patient-friendly materials were feasible to integrate into clinical practice, supported health education efforts, and were expected to enhance patient self-management of chronic conditions^{40,48}.

Language, presentation, and text volume significantly influenced acceptability of materials. Across multiple studies, service users and healthcare providers consistently favoured simplified, structured formats, with plain-language explanations enhancing comprehension and perceived usefulness^{38,40,44,45,48,53}. For example, a study on breast density education materials, found materials with excessive medical terminology were rated lower than a simplified version which was found to be less overwhelming and more engaging. Structured surveys and Likert-scale ratings of education pamphlets^{41,45} and discharge letters²⁸ showed service users preferred everyday language and reduced technical terms. Likewise, consumer-designed education leaflets assessed through structured telephone interviews⁴², were rated positively for content clarity, accessibility, and engagement.

Content design also influenced acceptability. Materials that used subheadings, short paragraphs, bullet points, and white space were viewed positively^{33,39}. Participants also favoured increased text size⁵⁴, colour and professional styling to highlight key information⁴⁵. Illustrations were also seen as effective in supporting patient understanding^{25,44}. However, few studies explored deeper dimensions of acceptability, such as emotional tone, representation, or cultural relevance. These aspects are well established in influencing how information is perceived and whether it is trusted or acted upon^{13,56}. UK standards, such as those published by NHS Digital⁵⁷, emphasise inclusive tone, accessibility, and user testing as essential principles of effective health communication.

While acceptability was consistently high, materials co-designed with service users often received the most positive feedback^{34,41,52}. In most studies, user involvement took the form of post-development feedback or usability testing, rather than co-design. Only a small number involved service users or public contributors in shaping the materials during the development phase. Preferences were also influenced by context, for example, older adults valued larger font and clearer visuals⁵⁴, while patients with prior healthcare experience reported greater appreciation for detailed, actionable instructions²⁵.

3.2.3 Impact on Health Outcomes

Interventions varied widely in content, delivery, and context, with some combining multiple components (e.g., simplified language, provider counselling, visual aids), making it difficult to isolate the specific effect of readability modifications alone. Nineteen studies evaluated tailored patient healthcare materials' impact on knowledge, comprehension, behavioural adherence, and health outcomes, utilising quantitative knowledge tests, self-reported surveys, clinical attendance data, and randomised controlled trials (RCTs). Most studies focused on proximal outcomes, such as understanding and behavioural adherence, with fewer examining behavioural change or direct health effects.

Ten studies used knowledge tests, surveys, or interviews to assess knowledge and comprehension after receiving modified materials^{25,30,33,34,36,41,43,44,47,48}. Across these ten, eight studies simplified healthcare materials improved knowledge retention and comprehension^{25,30,33,36,43,44,47,48}. For example, revised mammography recall letters improved comprehension from 50% to 95% after revisions, measured through pre- and post-knowledge tests³⁷. Similarly^{44,48,49} simplified outpatient letters and genetic counselling summaries significantly improved retention and comprehension as service users receiving revised information retained significantly more details of clinical consultations compared to those given standard materials^{44,48,49}. However, generalisability of these findings may be limited by participant characteristics in some studies. For example, samples included individuals with high educational attainment or HL, such as university students⁴⁷, while comprehension gains were found to be minimal in participants with lower education levels³⁰.

Behaviour related outcomes were assessed in eight studies^{26,27,29,31,32,37,43,51} with mixed results. These studies examined adherence to medical instructions, hospital readmission rates, and procedural compliance, using retrospective cohort methodologies, self-reported pre-post survey designs, structured patient interviews, and electronic health record tracking. Procedural compliance was assessed in five studies evaluating the impact of revised preparation instructions for medical procedures^{26,27,32}. Simplified bowel preparation instructions for colonoscopy led to improved adherence (69.1% vs. 65.5%) and lower cancellation rates (4.7% vs. 10.5%), assessed through procedure tracking and physician-rated patient preparation quality³². The impact of health literacy-informed education

leaflets on faecal occult blood test (FOBT) completion rates was notably higher among individuals with limited health literacy, with the education and nurse support intervention arm achieving a 76.9% completion rate compared to 39.1% in the comparison group; however, the independent effect of written patient materials remains unclear, as the intervention included additional support components. Study results showed that adherence to follow-up recommendations and completion rates increased only modestly from 90.1% to 93.9%³⁷.

Hospital readmission rates were also inconsistently affected. One study found a 50% reduction in hospital readmissions after revising discharge instructions²⁹. However, some found no statistically significant differences in readmission rates. For example, an RCT investigating a discharge letter tailored to the service users' health literacy with nurse-led discharge support, found no significant improvements in readmissions or emergency visits in the intervention arm⁵¹ yet the study was insufficiently powered to detect for differences in readmission rates. The limited evidence of measurable impact of HL interventions is further illustrated in a study evaluating a codesigned cellulitis discharge leaflet, which found high satisfaction but only marginal improvements in self-reported adherence and no measurable effect on readmission rates⁴³.

Only two studies measured direct health outcomes, reporting no statistically significant improvements. A study assessing the impact of minimising medical jargon on patient anxiety⁴⁹ found no significant improvements in anxiety or depression scores (EQ-5D) following simplified patient letters, despite perceptions of self-efficacy in managing their condition increasing. Similarly, when examining impact of tailored discharge materials, no significant differences in health-related quality of life or perceived current health was found between intervention and control groups, suggesting improved comprehension does not automatically translate into better health outcomes⁵¹.

3.2.4 Quality appraisal

Overall, the quality of studies reviewed was generally low (supplementary materials x). The mean MMAT score was 2.83 out of 5, and 15 (50%) studies achieved a score ≤ 2 . Common issues included poor reporting of missing information and lack of adherence to reporting guidelines. Qualitative study components scored the lowest, reflecting a lack of in-depth qualitative exploration. Randomisation and blinding were generally not reported in sufficient detail to make quality judgements in quantitative RCTs. Non-randomised studies frequently failed to report or account for potential confounding variables, weakening causal interpretations. In descriptive studies it was unclear whether measures used were appropriate. Mixed-methods studies generally scored poorly across domains suggesting mixed methodologies were not always warranted, failing to adequately address study aims, review findings must therefore be interpreted with caution.

4. Discussion

This review aimed to evaluate interventions designed to enhance readability of written patient healthcare materials within clinical settings. While study heterogeneity limited direct comparisons, the findings reinforce the importance of readability modifications in addressing HL, while also highlighting persistent gaps in understanding and operationalising measurable impact on long-term health behaviours and outcomes. Findings support that simplifying language and improving design, generally enhances comprehension, aligning with evidence that lowering reading age and improving formatting makes medical information more accessible to individuals with lower HL^{11,58}. Most studies used standard readability formulas such as Flesch-Kincaid, SMOG, and Fry Readability Graphs, reflecting best practice recommendations that patient content should not exceed a reading age of 9-11^{59,60}. It should be acknowledged that while this benchmark is commonly used, it may not meet the needs of all users. Some groups, including people with cognitive or communication difficulties, those affected by trauma, or individuals reading in a second language, may benefit from even simpler language and additional adaptations to content design⁶¹. Findings support that simplifying language and improving design, generally enhances comprehension, reflecting evidence that lowering reading age and improving formatting makes medical information more accessible to individuals with lower HL^{11,58}.

Study methods varied, some revised existing documents, while others developed new materials. Approaches often combined user feedback, design principles, and readability scoring, making it difficult to isolate a single component's impact. Nevertheless, given that HL is now recognised by the WHO as a key determinant of health⁵, incorporating readability assessments into quality assurance processes could support efforts to reduce health inequalities^{62,63}, particularly for vulnerable populations. There is currently no systematic auditing of patient materials for readability in the UK's National Health Service (NHS), despite patient facing content often exceeding the average population reading level^{62,63}, meaning health information remains out of reach for many, exacerbating existing health disparities and increasing the risk of poorer health outcomes⁴.

Despite none of the included studies examined the use of artificial intelligence, this is an important and rapidly evolving area. AI tools are increasingly used to support the development of patient-facing content, including the ability to adapt tone and simplify language. Recent work by Will et al. (2025) demonstrated that generative models such as ChatGPT substantially reduced the reading grade level of materials from major health organisations while preserving clarity and correctness⁶⁴. As AI becomes embedded in health communication, future research should explore how it is shaping the creation and reception of patient materials.

Acceptability was consistently high across service users and providers. Revised materials were rated as clearer, more engaging, and easier to navigate, in agreement with research showing that patient-friendly materials enhance satisfaction and engagement⁶⁵. Suggesting materials perceived as user-friendly may increase uptake and patient engagement⁶⁶.

Although revised materials were well-received, acceptability was often assessed through surface-level features such as formatting, layout, and plain language. While these are important, they do not fully reflect how people engage with health materials. Few studies explored how acceptability might differ across subgroups, including people with lower baseline literacy, varied cultural backgrounds, or lived experience of chronic illness. As Kreuter and McClure (2004) explain, tailoring content to the cultural context of the intended audience enhances relevance, trust, and overall engagement¹³. A narrow focus on simplification may overlook the importance of cultural and contextual relevance in supporting usability and uptake. An important next step is to explore whether tailoring content to specific populations improves not only comprehension but also perceived relevance and motivation to act.

Intervention acceptability was improved when materials were co-designed with stakeholders to ensure relevance and responsiveness to patient needs, which is an important finding. Some studies in this review described involving users in the development of materials but often did not distinguish between gathering user feedback and meaningful co-production. In practice, reviewing draft content is not equivalent to shaping it from the outset. In the UK, the Patient Information Forum's PIF Tick⁶⁷, outlines standards for high-quality health information, including early and active involvement of users in content development¹³. Materials designed without direct user insight may appear clear but still miss what matters most to their audience.

Findings indicate improved readability enhances knowledge retention and comprehension with results aligning to broader evidence that simplifying health information improves patient recall and confidence in following medical guidance^{59,68}. However, the measurable impact of readability interventions on behavioural adherence was mixed. Some studies reported improved procedural compliance and reduced hospital readmissions, while others found no significant effect on adherence rates or long-term treatment uptake. It remains unclear whether improved readability leads to changed health behaviours. Research suggests that perceived clarity does not always translate into greater adherence to medical advice⁶⁹. Behaviour is shaped by more than understanding alone, motivation and the context in which information is received are argued to contribute. The COM-B model, which describes behaviour as a result of interacting capability, opportunity, and motivation, could offer a useful framework for considering these factors⁷⁰. Readability may support psychological capability, but it does not address the broader social and structural conditions that influence behaviour. Behaviour change should not be expected from health literacy interventions alone; instead, they must be embedded within multi-level, theory-informed strategies that address the wider social, cultural, and structural factors influencing behaviour^{71, 72}.

4.1 Strengths and Limitations

The review synthesises a broad range of studies assessing acceptability and effectiveness, offering a comprehensive overview of the evidence base. Nonetheless, limitations must be acknowledged. The heterogeneity of study designs and outcome measures makes comparisons difficult. Readability assessments varied widely, with different measurement tools and frameworks used. Given the many factors that influence whether patient facing content is truly usable or trusted, user testing may be a more valuable way to assess the real-world effectiveness of patient materials. Testing with diverse users can reveal misunderstandings, emotional reactions, and barriers to action that readability scores alone cannot detect⁷³. Additionally, most studies assessed only short-term impacts, limiting conclusions about long-term impact and clinical outcomes.

Notably, most studies were conducted outside the UK. The predominance of US-based studies limits generalisability and specifically to the UK NHS, where service delivery models and patient demographics may differ, highlighting a significant gap in research concerning the readability and suitability of UK patient content. Study quality was generally low. Many suffered from small samples, weak designs, and inadequate follow-up, reducing the evidence' strength quality. Few studies provided detailed reporting on methodology or outcome measures. Future research should employ robust designs to evaluate specific readability-enhancing strategies and their longer-term impacts on engagement, behaviour, and health outcomes.

Furthermore, included studies considered patient materials as printed documents designed for use in healthcare settings. This approach may not reflect how health information is commonly accessed today. Content is increasingly delivered in digital formats such as apps, websites, patient portals, and videos⁷⁴, produced by charities or community groups rather than by healthcare organisations alone. Jenkins et al. (2023) note that health literacy develops across a wide range of everyday settings, including homes, schools, workplaces, and online environments⁷⁵. Information often used at home or shared informally, with carers and family members frequent users⁷⁶. The clinical focus of the review may have underrepresented these broader contexts that shape how people engage with health information. Future research should reflect these shifts by considering newer formats and the role of carers and support networks in information access and understanding

4.2 Conclusions

Organisations providing health content should prioritise interventions that improve the readability and clarity of patient materials, to increase their acceptability to address health disparities. By simplifying language and refining design, these materials can encourage patient engagement. Future research should evaluate modified materials perceived impact as well as long-term health outcomes, particularly in UK settings. This should involve

collaboration with users and healthcare providers in the development process, and establishment of clear methods for assessing readability and suitability. Healthcare leaders, policymakers, and administrators must take responsibility for driving these changes to ensure equitable access to clear, comprehensible health information.

Author statements

Author contributions

FC and JD conceptualised the study and engaged in the funding acquisition. Several authors contributed to stages of screening and data collection: Searching databases was conducted by CB and CF, screening titles and abstracts CB, CF and JD. Screening articles JH, and JD, and data extracted by JH and AT. The manuscript was drafted by JD, and JH. All authors (FC, JD, JH, CB, CF, AT, LD, RS) edited and critically reviewed the manuscript and approved the final version.

Author statements

Ethical approval

No ethical approval was required as the review was based on secondary analysis of published literature.

This systematic review is reported in line with PRISMA guidelines²¹, and pre-registered with PROSPERO (registration number: CRD42024536800).

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Competing interests

The authors declare no competing interests.

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