BMJ Open

Health literacy and cardiovascular disease prevention: a systematic scoping review protocol

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ABSTRACT

Introduction Health literacy is 'The skills and resources of a person to access, understand and use information to make decisions, and take action on their own health and healthcare'. Literature investigating cardiovascular disease (CVD) prevention and health literacy often exist in silos, only exploring one element of prevention. This protocol aims to establish a scoping method of articles investigating health literacy and CVD preventive practices or knowledge in lay populations.

Methods and analysis A scoping review was deemed the most appropriate study design. The topic was conceptualised, with preliminary searching informing subsequent development of search strings. A search of the following databases will be conducted on 31 January 2022: MEDLINE, Global Health, PubMed, Embase, PsycINFO and CINAHL. Studies included will be published in English, of appropriate design, measuring health literacy and some aspect of primary CVD prevention in lay-populations. These criteria will be tested against 25 'pilot' articles from the results, undergoing necessary review before screening commences. A secondary author will screen 10% of abstracts, with a third subject-matter expert reviewing conflicts.

Ethics and dissemination This review will be disseminated through peer-reviewed scholarly networks, most likely including journal publication and conference presentation.

Article summary CVD is the leading cause of death around the world. This paper proposes an exploration of health literacy's relationship with CVD prevention as a whole, contrasting with the more segmented reviews currently published.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This will be the first review to synthesise existing knowledge in the health literacy field concerned with cardiovascular disease prevention.
⇒ The heterogeneity of study designs mean the rigour of a systematic review will not be achieved.
⇒ Results will provide an understanding of how health literacy has been used to prevent cardiovascular disease in general populations.
⇒ A comprehensive search strategy of six databases, based on a librarian-informed, iterative process.
⇒ Data extraction template has not been tested for quality or homogeneity between studies.

INTRODUCTION

Cardiovascular diseases (CVDs) are a group of non-communicable diseases which affect the heart and vascular system. CVD was responsible for 17 million deaths in 2008,[1] making it the leading cause of death worldwide, with this expected to increase by 6 million by 2030.[2] Despite this, 80% of all CVD can be prevented through modifying individual lifestyle.[2] Often referred to as the 'cause of causes', socioeconomic position influences individual CVD risk through complex relationships affecting health behaviours, access to services and subsequent knowledge.[3–5]

Often referred to as the 'bridge' between social position and individual health behaviours,[6] health literacy (HL) is 'The skills and resources of a person to access, understand and use information to make decisions, and take action on their own health and healthcare'.[7 8] Health literacy can be further broken into three categories; functional (including reading, writing and comprehension of health information), interactive (using and applying information from communication) and critical (critically analysing, and using, health information).[7 9]

Health literacy has previously been associated with a host of suboptimal health outcomes, most notably by Berkman et al's review, which found low health literacy increased risk of hospitalisation, receipt of emergency care, poor medication adherence and ability to interpret health messaging, which was later extended to online health messaging by Diviani et al's review.[10 11] Specific to populations with CVD, Elbashir et al's review found that varying definitions of health literacy were used, and often only functional health literacy was measured.[12] Kanejima et al later conducted a meta-analysis
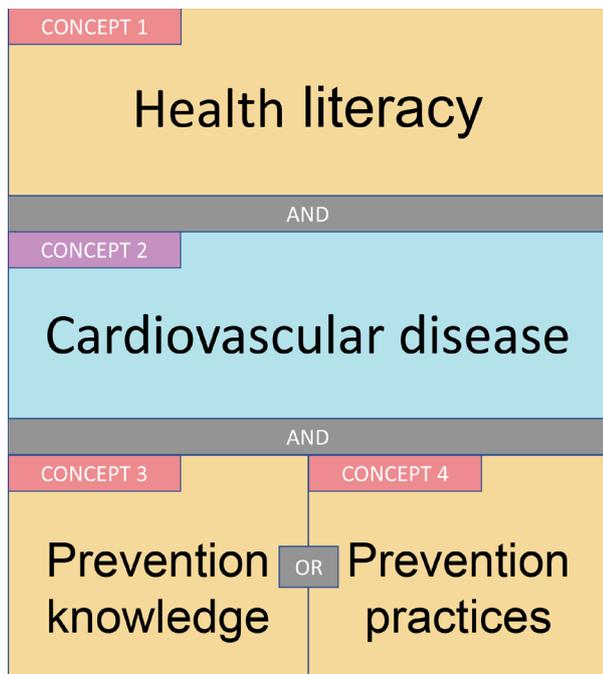
Figure 1 An adaptation of initial search strategy.

on health literacy in CVD populations, and found HL had a significant impact on mortality and readmission.[13]

Shifting to primary prevention, evidence around health literacy's relationship to CVD risk is less integrated. While Buja *et al*'s review found a clear association between health literacy and physical activity,[14] other risk factors for CVD have yielded even more unclear results; Greenthal's review of global alcohol literacy found heterogenous results, making an understanding of current levels quite difficult.[15] Similarly mixed results around health literacy's relationship to nutrition were seen in Malloy-Weir *et al*'s and Buja *et al*'s review.[16 17] To date, no review has attempted to synthesise evidence around health literacy and smoking behaviours, but recent studies show varying levels of association.[18 19] Similarly, no review to date has examined health literacy's role in perceptions of CVD in populations without CVD, despite such a relationship being found in some populations with CVD.[20]

Clinical risk factors for CVD and health literacy are slightly better understood than behavioural; particularly hypertension and type 2 diabetes. In their 2021 systematic review, Isa *et al* found a positive relationship in 12 of 16 studies investigating health literacy and blood pressure control.[21] Notably, these studies were mainly conducted in hypertensive populations, and tended to only measure one or two elements of health literacy, rather than its full definition. Du *et al* found similar results in their earlier integrative review.[22] Dahal and Hosseinzadeh conducted a systematic review which found relationships between health literacy and various aspects of diabetes self-management, including disease knowledge, physical activity and management self-efficacy.[23] A 2021 review of health literacy interventions for type 2 diabetics found varying degrees of success in improving diabetes

self-management, suggesting health literacy interventions may be able to play a role in the prevention of CVD in diabetics.[24]

When interpreted as a whole, this body of work suggests there are associations between health literacy and primary prevention of CVD. However, this evidence is scattered across several reviews, often not synthesised through a lens of CVD prevention. Also, some elements of CVD prevention, such as risk perception, have not been synthesised at all in relation to health literacy. Gathering this wide body of evidence around health literacy's role in CVD prevention, varying in size and quality, would enable a coherent view of what evidence is currently available, significant gaps within the field, and ultimately, how health literacy may affect the primary prevention of CVD, in both a static and intervention sense. Thus, this protocol aims to establish a method to scope studies which measure both health literacy and CVD preventive practices and/or knowledge in lay populations.

METHODS AND ANALYSIS
Literature gap
A preliminary search for existing reviews was conducted on 14 January 2022, using the broad term 'health literacy' to ensure varying interpretations of the concept would be found. The following databases were searched:
► JBI Evidence Synthesis.
► Cochrane Database of Systematic Reviews.
► Cumulative Index to Nursing and Allied Health Literature (CINAHL).
► MEDLINE Complete.
► Education Resources Information Center (ERIC).
► APA PsycINFO.
► Global Health.
► Open Registries.
► Research Registry.

An additional search for review protocols was also completed through Cochrane, Campbell and PROSPERO. No reviews or protocols displayed any degree of addressing this question, thus, a protocol was registered on Open Science Framework Registries.[25] Due to the broad conceptual nature of exploring HL frameworks for CVD prevention, a scoping design was deemed more appropriate than systematic.[26]

Preliminary search strategy

A search planner was completed to conceptually visualise the search (figure 1). It became apparent at this stage that there may be some overlap between concepts 1, 3 and 4; for this reason, a more broad, sensitive rather than specific strategy was decided on for subsequent stages.

Preliminary iterative searches were conducted in MEDLINE, Global Health, PubMed, Embase, PsycINFO and CINAHL, using keywords "health literacy", "cardiovascular disease", "knowledge", "behaviour", "prevention", as well as their synonyms and variants. From these,

Table 1 Medline search strategy

Search 1	((MH "Knowledge") OR (MH "Health Knowledge, Attitudes, Practice") OR (MH "Attitude to Health+") OR (MH "Awareness") OR (MH "Comprehension")) OR TI (know* OR awar* OR understand* OR percep* OR perceiv* OR attitude*) OR AB (know* OR awar* OR understand* or comprehen* OR "risk perception" OR percep* OR perceiv* OR attitud* OR opinion*)
Search 2	((MH "Health Behavior+") OR (MH "Behavioral Risk Factor Surveillance System") OR (MH "Risk Factors") OR (MH "Health Risk Behaviors") OR (MH "Protective Factors") OR (MH "Primary Prevention+")) OR TI (behavio#r* OR lifestyle OR "risk factor*" OR prevent*) OR AB (behavio#r* OR lifestyle OR "risk factor*" OR prevent*)
Search 3	((MH "Health Literacy+") OR TI (health literacy OR "Health literacy questionnaire" OR HLS-EU OR TOFHLA OR S-TOFHLA OR NVS OR "Newest Vital Sign" OR REALM OR "Test of functional health literacy" OR "Rapid estimate of adult literacy in medicine") OR AB (health literacy OR HLQ OR "Health literacy questionnaire" OR HLS-EU OR TOFHLA OR S-TOFHLA OR NVS OR "Newest Vital Sign" OR REALM OR "Test of functional health literacy" OR "Rapid estimate of adult literacy in medicine")
Search 4	((MH "Cardiovascular Diseases+") OR TI ("Cardiovascular disease" OR CHD OR stroke OR "myocardial infarction" OR "Heart attack" OR "Heart Disease" OR "Heart failure" OR "arter* disease" OR "atrial fibrillation") OR AB (CVD OR "Cardiovascular disease" OR CHD OR stroke OR "myocardial infarction" OR "Heart attack" OR "heart disease" OR "Heart failure" OR "arter* disease" OR "atrial fibrillation"))
Search 5	S3 AND S4 AND (S1 OR S2)

'gold standard' papers were identified, and their index terms analysed. Most common subject headings identified were "health literacy", "cardiovascular diseases", "health behavior [sic]", "health knowledge, attitudes, practice" and "attitude to health".

These terms were integrated into a generalised search strategy. With the assistance of a health librarian, this strategy was refined and translated for each database, creating a final, comprehensive strategy (see table 1 for MEDLINE search). No 'gold-standard' articles were found to be excluded from a preliminary search using this strategy.
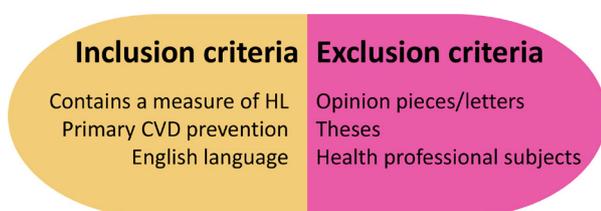
Inclusion criteria

A summary of inclusion/exclusion criteria is outlined in figure 2. Articles not published in English will be included only where accurate translation sources can be secured. Where this is not the case, but an English-language abstract enables title-and-abstract screening, abstracts which otherwise meet inclusion criteria will be tabulated by language, balancing an avoidance of complete Anglo-centralism with only reviewing accurate, author-intended material. This review will exclude opinion articles, commentaries, editorials, case studies and letters to the editor. Theses will also be excluded due to their lack of peer-review process. Studies which do not record a measure of health literacy in their design will be excluded, to avoid inclusion of studies which have utilised health literacy principles, but not incorporated

them into study design. In a similar sense, studies which do not explicitly mention CVD prevention in their full text will be excluded (Though a disease within the CVD umbrella, for example, stroke, will suffice). Studies concerned with secondary and tertiary prevention, that is, prevention of further CVD progression, will be excluded in order to maintain an appropriate scope. As this study is concerned with 'lay-people', articles where subjects are health professionals will be excluded, including students, researchers and support staff. Authors of studies which have not disclosed ethics approval in their full text will be contacted, and where contact is unsuccessful, will be excluded from full text. No limits for date of publication will be set, due to HL's relatively modern application.

Screening process

To optimise the final screening process, a pilot test will be conducted. In this process, a random sample of 25 titles/abstracts will selected. Members of the research team will then screen each of these, using inclusion/exclusion criteria and definitions (table 2). This process will be followed by a team meeting, where discrepancies are discussed and elaborations on definitions and inclusion/exclusion criteria are made where necessary. Screening of the whole set will commence when 92% (23 of 25) agreement of abstracts to be included/excluded is reached. The 25 piloted studies will be re-examined to ensure their status is upheld, according to new criteria and definitions.

After piloting, search indexes will be imported to Covidence software (Covidence, Melbourne, Australia), where initial screening will occur based on title and abstract content. After duplicates are removed, one reviewer will screen all results for further full-text examination, accompanied by a second reviewer's screening of a randomly selected 10% of results. All discrepancies will be discussed, with a third reviewer deciding on articles still disputed after initial discussion. If a less than 80% agreement occurs between the two reviewers after initial discussions,

Inclusion criteria
Contains a measure of HL
Primary CVD prevention
English language

Exclusion criteria
Opinion pieces/letters
Theses
Health professional subjects

Figure 2 Inclusion criteria summary; abstract screening stage.

Term	Definition
Health literacy	The skills and resources of a person to access, understand and use information to make decisions, and take action on their own health and healthcare.[7 8]
Cardiovascular disease (CVD)	CVDs are a group of disorders of the heart and blood vessels including, but not limited to, coronary heart disease, stroke and peripheral artery disease[1].

Table 2 Definitions of study terms

a second full reviewer will be integrated into the process and inclusion/exclusion criteria will be reviewed with a subject matter expert. Following the limited review, full texts of included abstracts will be reviewed by the primary author, accompanied by a second reviewer's screening of a randomly selected 10% of results. Snowball screening will then occur, where reference lists of included articles will be hand-searched for further articles which may be included, subject to limited and full screening process. A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart will be included in the review to transparently display the final process and its results.

Data extraction

The following variables will be extracted:
- ► Author.
- ► Year.
- ► Study type.
- ► Population.
- ► Country.
- ► Health literacy tool used.
- ► Element of health literacy measured (ie, functional, critical, interactive).
- ► Definition of health literacy used.
- ► Secondary measure used.
- ► Intervention type (if applicable).
- ► Sample size.
- ► Key findings.

These will be extracted from any articles included in the pilot screening stage by the primary author. Variables to be extracted may be updated at this stage, if other salient data becomes apparent. Data will be descriptively mapped and frequency counts will occur for extracted data where possible. Though a formal assessment of bias-risk is not feasible within the limits of this scoping review, bias risk will be assessed using OHAT Risk of Bias Rating Tool for Human and Animal Studies[27] and narratively reported on. Results will be reported using a table of extracted data, adapted from the final extraction variables chosen. A PRISMA diagram will be completed to illustrate the final yield of search results and their subsequent inclusion/exclusion.[28]

Ethics and dissemination

This study will only use articles which have received ethics approval, negating the need for approval of this study. This review will be published in a peer-reviewed scholarly journal with a health literacy scope. These results may also be disseminated through other scholarly, peer-reviewed networks such as conferences, poster displays and industry reports. Resulting data from this review will be uploaded to Deakin University's data repository and made available on reasonable request.

CONCLUSION

This paper proposes an expansion of health literacy's relationship with CVD; from a tool which can be used to assess strengths and needs of CVD patients to those of populations not diagnosed, but at future risk for CVD. While several studies have explored this relationship, it is currently scattered across a range of objectives, lacking the unification necessary to examine HL and CVD prevention in a more comprehensive manner. Results from the proposed study would illuminate aspects of health literacy which relate most strongly to CVD prevention, providing an evidence base for more targeted research and development of health literacy interventions.

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