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Effect of religious involvement on cognition from a life-course perspective: protocol for a systematic review and meta-analysis

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ABSTRACT

Introduction: Preserving cognitive health is a crucial aspect of healthy ageing. Both abnormal and normal cognitive decline can adversely affect the health of ageing populations. Evidence suggests religious involvement (RI) can preserve cognition in ageing populations. The primary purpose of this review is to examine the evidence regarding the association between RI and cognition from a life-course perspective.

Methods and analysis: This systematic review and meta-analysis has been registered with PROSPERO (registration number CRD42016032331). We will search MEDLINE, PSYCHINFO and EMBASE, and include primary studies with a comparison group, for example, cohort, cross-sectional and case–control studies. To supplement the database search, we will also search the grey literature and the reference lists of included studies. Two reviewers will independently assess and extract data from the articles. Risk of bias and the strength of evidence will be assessed. For sufficiently homogeneous data in domains such as study methods and measures of RI and cognition, we will pool the results using DerSimonian and Laird meta-analysis.

Ethics and dissemination: Since this is a protocol for a systematic review, ethics approval is not required. The findings of this review will be extensively disseminated through peer-reviewed publications and conference presentations.

Strengths and limitations of this study

- The major strength of this review will be to study the association between religious/spiritual involvement and cognition from the life-course perspective, which best accounts for the effects of changing social phenomena on health outcomes.
- No agreed on definition of religious/spiritual involvement exists and researchers therefore use many instruments to measure the construct.
- Thus, within this review, we will include a heterogeneous set of exposure measures that could challenge our ability to make comparisons using meta-analysis. The same issue applies to cognition due to the multiplicity of instruments that exist to measure it.

BACKGROUND

The maintenance of cognitive health is an important component of successful ageing. Abnormal cognitive decline is associated with the onset of dementing disorders such as Alzheimer's disease. Even natural cognitive decline in later life can adversely affect health through loss of mobility, increased reliance on assistance to help with performing daily tasks, and reduced quality of life as a result of new limits on one's ability to maintain a certain lifestyle.[1]

Religious/spiritual involvement (R/SI) may provide a soothing outlet for feelings of stress and depression. Such an outlet can counteract the physiological changes (eg, elevated blood cortisol) associated with experiencing stress and depression. These changes can otherwise negatively affect the areas of the brain that are responsible for memory.[2–4]

Koenig proposes that R/SI can stimulate the higher cortical functions related to abstract thinking and thereby preserve cognitive function. This stimulation occurs because religious practitioners often think about 'higher order' issues such as morality, meaning in life and transcendence.[5] Hill views R/SI as giving practitioners a greater sense of hope, meaning and purpose in life, all of which can serve as coping mechanisms against stress, anxiety and depression. Reduced strain on one's emotional and mental health can help prevent hippocampal atrophy and cognitive decline.[6] Hill believes religious practices such as singing, praying, attending sermons, studying scripture and socialising with others during faith-based activities can maintain dense neocortical brain synapses and delay cognitive deterioration in the elderly.

OBJECTIVES

We will undertake a systematic review and examine whether R/SI is associated with cognition over the life course in adults (primary research question). The life-course perspective envisages a dynamic process whereby intrinsic (eg, biological) and extrinsic (eg, environmental) factors, as well as changes in these factors over time, combine to affect health in later life.[7] Longitudinal changes in the degree of R/SI and cognition over time, rather than simply assessing R/SI at baseline and cognition at some future point, will provide a full appreciation of the association between R/SI and cognition. Changes in other variables over time (ie, functional ability, presence of comorbidities) that can affect the degree of R/SI or cognition will also be examined to assess the association of interest.

We will examine two secondary research questions in the review. First, does any form of social engagement serve as a mediator, effect modifier or confounder of the association between R/SI and cognition? Adjusting for social engagement is needed in studies of R/SI because R/SI involves a social component (eg, attending services, singing in choirs, serving on committees, attending retreats, taking courses [eg, Bible study]) and researchers should assess whether R/SI has an effect over and above social engagement.[8 9]

Second, does the association between R/SI and cognition differ (in strength or direction) according to the means of measuring R/SI or cognition? Many measures of R/SI exist, including scales to measure degrees of spirituality or religiosity,[10–12] attitudes toward Christianity,[12] degrees of religious self-identity and conviction,[8 13] and religious coping.[14 15] Additional measures include frequency of viewing religious television and radio programming,[13] frequency of religious service attendance[8 9 13 16] and frequency of prayer.[13 17]

Additionally, many different measures of cognition exist. They vary depending on the specific domain of cognition that is intended for assessment, as well as according to the type of test (questionnaire-based scales vs neurocognitive assessments).

METHODS

This systematic review and meta-analysis has been registered with PROSPERO (registration number CRD42016032331). We developed our methods following the instructions of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis[18] (PRISMA) guidelines and the systematic review itself will be also written in accordance with the PRISMA and PRISMA-P[19] statements.

Studies will be selected according to the following eligibility (inclusion/exclusion) criteria.

Study designs

This review will include primary studies that contain a comparison group (eg, cross-sectional, case–control and cohort). We will exclude narrative or systematic reviews, letters to the editor, abstracts, case series and animal studies.

Participants

We will include any study of adults (18 years or older) to understand the association between R/SI and cognition from a life-course perspective. Limiting inclusion to studies conducted in the aged (ie, age ≥65 years) would reduce the review's potential to examine important issues such as whether persons who maintain ongoing R/SI over time experience better cognitive outcomes than persons who increase or decrease their R/SI at a certain point in life.

Exposure

We will include any measure of R/SI, including (but not limited to) the measures of R/SI described above.

Outcome

We will include any means of measuring cognition, including (but not limited to) the measures described below.

Intellectual functioning: Wechsler Adult Intelligence Scale-Revised (WAIS-R),[20] Stanford-Binet Intelligence Scale-IV[21]

Language processing: Boston Naming Test,[22] Multilingual Aphasia Examination,[23] Token Test[24]

Visuospatial processing: Rey-Osterrieth Complex Figure,[25] Hooper Visual Organisation Test[26]

Attention/concentration: Paced Auditory Serial Addition Test (PASAT),[27] Serial Sevens[28]

Verbal learning and memory: Wechsler Memory Scale (WMS),[29] Rey Auditory Verbal Learning Test,[30] Hopkins Verbal Learning Test[31]

Executive function: Wisconsin Card Sorting Test,[32] Trail Making Test,[33] Mini-Mental State Examination (MMSE),[34] Mental Alternation Test,[35] Animal Naming Test[36]

Processing speed: Symbol Digit Modalities Test,[37] Reaction Time Assessments

Timing

We will include studies published since 1990 onwards and regardless of length of follow-up.

Setting

Studies undertaken in any setting will be eligible for inclusion (eg, community, hospital, long-term care facility).

Language

Studies published in any language will be eligible for inclusion. Studies published in any language other than English will be translated into the English language and assessed for eligibility.

Information sources

We will search MEDLINE (OVID interface, 1990 onwards), EMBASE (OVID interface, 1990 onwards)

and PSYCHINFO (OVID interface, 1990 onwards). We chose 1990 as the start date because preliminary scoping of the literature suggested no relevant citations would be retrieved prior to 1990. We will also search the reference lists of included studies. We consulted a medical librarian to develop our search strategy. Our final search terms include textwords (memory [prospective, episodic, declarative], executive function, processing speed, spirituality and church attendance) and exploded subject headings (cogniti*, religio*). The MEDLINE search strategy is included in online supplementary appendix 1. The MEDLINE strategy will be adapted to the syntax and subject headings of the other databases. We will also employ the aforementioned textwords to search the grey literature via Google and will include any studies that report on the association between R/SI and cognition.

Study records

We will use Distiller Systematic Review (DSR) software to facilitate collaboration among our reviewers during the process of study screening. We will use our eligibility criteria to develop screening questions for title/abstract and full-text screening.

Study selection and data extraction

Two raters will independently screen studies for inclusion based on our eligibility criteria. The raters will perform two levels of screening: (1) title/abstract and (2) full text. Studies that meet the eligibility criteria at the title/abstract screening level, along with studies that the raters cannot confidently call as relevant based on the eligibility criteria, will advance to full-text screening for further consideration. At each screening level, the raters will resolve disagreements by consensus.

Two reviewers will independently extract the following data from each included study: study details (eg, authors, year, country, setting, length of follow-up), sample characteristics (eg, age, sex), study design (eg, case-control, cohort, cross-sectional), descriptions of how R/SI and cognition are measured, list of covariates included in regression models and study outcomes. The reviewers will contact study authors to address any uncertainties regarding the data they wish to extract.

To ensure consistency in screening and data extraction across multiple personnel, we will develop standardised instructions and programme web forms into DSR. We will pretest the instructions and forms on 20 randomly selected studies.

Assessment of risk of bias

Two raters will use the Newcastle-Ottawa Scale (NOS) (http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp) to independently assess the risk of bias of the included studies. The raters will resolve discrepancies through consensus. The NOS assesses three domains, including selection of study groups, comparability of study groups and detection of outcome. The scale comprises two subscales, one geared toward cohort studies and one designed for case–control studies. The NOS has also been adapted for use with cross-sectional studies.

Grading strength of evidence

To evaluate the strength of evidence on the topic, we will use the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach.[38] Two raters will independently assess the strength of evidence in five areas: study design, quality, consistency directness and precision. The raters will add or subtract points for each of these categories in line with GRADE guidelines. By adding or subtracting points, GRADE helps us assess whether further evidence from newly published studies would change the conclusions of the review.

Data synthesis and statistical analysis

We will narratively synthesise the extracted data[39] from all included studies. For subsets of studies that are sufficiently homogeneous in terms of sample characteristics, measures of R/SI and cognition, and methods (eg, design, setting, length of follow-up), we will pool results using DerSimonian and Laird's random effects meta-analysis model,[40] implemented through R V.3.2.2 statistical software (R Foundation for Statistical Computing, Vienna, Austria).

DISCUSSION

The systematic review will provide the most comprehensive assessment of the state of knowledge on the association between R/SI and cognition to date. The major benefit of this review will be to study the association from the life-course perspective, which best accounts for the effects of changing social phenomena on health outcomes. This perspective views ageing as a dynamic process whereby individuals are impacted by changing intrinsic (eg, biological) and extrinsic (eg, environmental) factors over time. These factors may directly affect individuals' health as they age. In addition, these factors could prompt behavioural and lifestyle changes that also affect health over time. From a life-course perspective, longitudinal changes in the association between R/SI and cognition are important, as are changes in other variables (i e, functional ability, presence of comorbidities) that can affect the degree of R/SI or cognition over time. We anticipate that this review will uncover valuable information regarding the potential enhancing effect of R/SI on cognition.

Some potential shortcomings of this review should be mentioned. No agreed on definition of R/SI exists and researchers therefore use many instruments to measure the construct. Thus, within this review, we will include a heterogeneous set of exposure measures that could challenge our ability to make comparisons using meta-analysis. The same issue applies to cognition due to the multiplicity of instruments that exist to measure it.

Agli *et al*[41] recently published a systematic review of studies examining R/SI and dementia. In comparison to Agli *et al*'s review, our systematic review will seek to examine the evidence for the link between R/SI and cognition in any population regardless of cognitive or disease status (ie, normal cognition, mild/moderate cognitive decline, severe cognitive decline or dementia). Our proposed systematic review will therefore include a much broader population than Agli *et al*'s review.

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Contributors SH wrote the protocol and will lead the conduct of the systematic review. MO conceived the study and revised the protocol for important intellectual content. AC and MC revised the protocol for important intellectual content. MO, AC and MC will provide conceptual and methods guidance throughout the review. All of the authors have read and approved the final submitted protocol.

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