



Review

Social relationships and risk of dementia: A systematic review and meta-analysis of longitudinal cohort studies



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ABSTRACT

It is unclear to what extent poor social relationships are related to the development of dementia. A comprehensive systematic literature search identified 19 longitudinal cohort studies investigating the association between various social relationship factors and incident dementia in the general population. Relative risks (RRs) with 95% confidence intervals (CIs) were pooled using random-effects meta-analysis. Low social participation (RR: 1.41 (95% CI: 1.13–1.75)), less frequent social contact (RR: 1.57 (95% CI: 1.32–1.85)), and more loneliness (RR: 1.58 (95% CI: 1.19–2.09)) were statistically significant associated with incident dementia. The results of the association between social network size and dementia were inconsistent. No statistically significant association was found for low satisfaction with social network and the onset of dementia (RR: 1.25 (95% CI: 0.96–1.62)). We conclude that social relationship factors that represent a lack of social interaction are associated with incident dementia. The strength of the associations between poor social interaction and incident dementia is comparable with other well-established risk factors for dementia, including low education attainment, physical inactivity, and late-life depression.

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1. Introduction

Dementia has emerged as major public health issue because of high prevalence rates, high burden to patient, carer and society, and high health care costs (Langa et al., 2001; World Health Organization, 2012). In 2010, more than 35 million people worldwide were affected by dementia and this is expected to increase to 115 million people in 2050 (Ferri et al., 2006; Prince et al., 2013). Increased longevity and the aging of the baby boom generation largely contribute to the increased prevalence of dementia (Middleton and Yaffe, 2009; World Health Organization, 2012). The prevalence of dementia approximately doubles with every 5-year increase in age after the age of 60, from 1% among people aged 60 to 25% among people aged ≥ 85 years from Western Europe in 2001 (Ferri et al., 2006). An average delay of two years in onset of Alzheimer's disease (AD) could decrease the worldwide prevalence of AD by 22.8 million cases by the year 2050 which would subsequently lower the number of cases that need high level care and associated costs (Brookmeyer et al., 2007). Currently, there is no effective treatment available to cure dementia. Therefore, identification of modifiable risk factors is of utmost importance in order to delay or prevent the onset of dementia (Middleton and Yaffe, 2009). One potentially important modifiable risk factor for incident dementia is the absence of good social relationships. Good social relationships were found to protect against multiple adverse outcomes, including depression (Santini et al., 2014), coronary heart disease (Hemingway and Marmot, 1999), functional decline (Avlund et al., 2004), and mortality (Holt-Lunstad et al., 2010). The definition and operationalization of social relationships differs across studies. Social relationships can for example contain structural features such as the number of one's social ties, but also qualitative aspects such as levels of social support (Seeman et al., 2001). It is important to distinguish between these different aspects of social relationships, because they may influence health through different mechanisms (Cohen, 2004). For example, social integration may have a beneficial effect on health through influencing health behaviors. Whereas social support may benefit health through stress reduction, by providing psychological and material resources needed to cope with stress (Cohen, 2004).

Previous reviews have investigated the influence of social relationships (i.e., socially integrated lifestyle, social engagement, social activities) on incident dementia, but conclusions were contradictory (Di Marco et al., 2014; Fratiglioni et al., 2004; Pillai and Verghese, 2009; Wang et al., 2012; Williams et al., 2010). The reviews did not perform a meta-analysis, did not distinguish between various social relationship factors, or did not take into account the methodological quality of the included studies.

Therefore, our aim is to investigate the relation between social relationships and incident dementia in the general population by

conducting a systematic review, including a meta-analysis of longitudinal cohort studies, in which we will take into account different aspects of social relationships (e.g., social network size, social participation, loneliness).

2. Methods

This systematic review was conducted according to the methods of the Cochrane Collaboration (Higgins and Green, 2008) and in addition, we followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher et al., 2009) for the reporting of this systematic review and meta-analysis.

2.1. Systematic search and study selection

A systematic database search in MEDLINE, Embase and PsycINFO was conducted on July 9th 2012. Search strings included suitable indexing terms (i.e., MeSH terms and keywords) on (1) social relationships (e.g., social network; social engagement; loneliness) and (2) dementia (e.g., dementia; Alzheimer's disease; cognitive decline) (see Appendix A). Articles were included if they were peer reviewed articles reporting on an association between social relationships measured at baseline and incident dementia during follow-up in a quantitative way; utilizing a longitudinal prospective cohort study design conducted in the general population. Only articles published in English; Dutch; German or French were included. Two reviewers (JSK and MZ) independently screened title and abstract of all citations identified by the search. Subsequently; the full text of all potentially eligible articles was screened for final selection by the same reviewers. Reference lists of all included articles and relevant reviews on this topic were screened for potentially eligible studies.

2.2. Data extraction and methodological quality assessment

Two reviewers (JSK and MZ) independently extracted the data regarding study population, social relationship assessment, statistical method and results, timing of follow-up measurements, and outcome (incident dementia). The methodological quality of included studies was assessed by the two reviewers (JSK and MZ) independently using the Quality of Prognosis Studies in Systematic Reviews (QUIPS) tool (Hayden et al., 2006) (see Appendix B). Disagreements were resolved in a consensus meeting. In case of persistent disagreement, a third reviewer (NS) made the final decision.

2.3. Statistical analysis

Social relationship factors were categorized into (1) social network size; (2) social participation (e.g., participation in associations

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