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Social support from the closest person and sleep quality in later life: Evidence from a British birth cohort study

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ABSTRACT

Objectives: Supportive social relationships have been found to be related to fewer sleep problems and better sleep quality. We examined associations between positive and negative support from the nominated close person across 15 years of follow-up with sleep quality in older age.

Methods: MRC National Survey of Health and Development study members reported sleep quality at age 68 (n = 2446). Cumulative exposure to and changes in positive and negative support were derived from data at age 53, 60–64 and 68 years. Pittsburgh Sleep Quality Index scores were regressed on social support measures adjusted for i) gender only then additionally ii) education, marital status, number in household, limiting illness, body mass index, caregiving, iii) and affective symptoms.

Results: Greater exposure to positive support and lower exposure to negative support over 15 years were independently associated with better sleep quality at age 68. Sleep quality was poorer for those who experienced declining positive support or increasing negative support. Those who nominated their spouse/partner as their closest person at age 53 but not at age 68 had poorer sleep quality than those who nominated their spouse on both occasions. These associations were not explained by the covariates, including affective symptoms.

Conclusions: Based on repeat data on support from the closest person, this study finds a link between declining social relationship quality and poor sleep quality. Whilst acknowledging that the association may be bi-directional, the study suggests that interventions to improve older people's social relationships may have benefits for sleep.

1. Introduction

Sleep disorders are more common among older compared with younger adults [1–2] and, in later life, have been linked to mortality and cardiovascular disease risk [3,4], physical symptoms, limitations and falls [5,6], cognitive decline [7] and poor health-related quality of life [8]. Sleep is "embedded within the social world" [9] and supportive social relationships have been found to be related to fewer sleep problems and better sleep quality among middle-aged and older adults [10–12] as well as in general population samples [13] and working age and occupational samples [14]. However, one national study of older married women found that overall social support across multiple sources was not associated with sleep disturbance, though quality of the marital relationship was [15]. This could indicate that close relationships are particularly relevant for sleep in older age, as others have found [11], possibly because people tend to prioritise meaningful relationships as they age [16] and because of an increased risk of interpersonal life events such as widowhood and caregiving.

Close relationships can entail positive and negative elements. They can be a source of emotional, instrumental and other forms of support but also entail strain and conflict and both positive and negative support have been found to be associated with sleep quality. Negative support is positively correlated with sleep problems [11,12,17] though one study found that positive but not negative aspects of the marital relationship were associated with reported sleep quality [18]. One study examined positive and negative aspects of family relationships, finding in an all-age representative sample that both support and strain were related to sleep disturbance when considered singly and that a combination of strain and low support was associated with poorest sleep quality [17]. In an integrative model that considered combinations of positive and negative support, having a higher number of ties characterised by high positivity and low negativity was associated with better sleep quality whilst a higher number of ties characterised by high negativity and low positivity was associated with poorer sleep quality [11].

Studies of social support and sleep in older age tend to rely on cross-

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sectional designs and do not imply a causal association, nevertheless there are a number of plausible explanatory pathways linking positive and negative support from close persons to sleep in later life. Confiding support improves emotion regulation and facilitates cognitive reappraisal of stressors, linked to reduced likelihood of poor sleep [19]. Other positive aspects of social support, including sense of belonging, shared interests and feeling valued, can all enhance positive mood, which is linked to better sleep [12,20,21]. Negative aspects of social relationships, including worries and problems relating to a close person and interpersonal conflict, may lead to ruminating, negative affect and physiological arousal, all linked to poorer sleep [21–24]. It is of interest to consider the role of affective symptoms since these are intimately linked with sleep. Disturbed sleep is one symptom used to diagnose affective disorder so there is definitional overlap but longitudinal data also indicate a bi-directional link between the two [25].

The aim of the current study is to describe cross-sectional associations between positive and negative social support and sleep quality at age 68 in a large British birth cohort study and also to examine whether changes in social support over the previous fifteen years of follow-up are related to sleep quality. We consider both overall sleep quality and sleep subscales, since associations may differ according to the sleep component of interest [26]. We focus on support derived from the closest person. Gender is a key determinant of sleep [27] and differentiates levels of social support so we test whether gender modifies associations between sleep and support. We also test whether identity of the closest person modifies these associations. Finally, we test whether any associations operate independently of or are explained by depressive symptoms. We hypothesised that positive support would be cross-sectionally associated with higher sleep quality and negative support with poorer sleep quality. We further hypothesised that declines in positive support, increases in negative support and changes in the identity of the closest person would be associated with poor sleep quality.

2. Methods

2.1. Participants

The Medical Research Council National Survey of Health and Development (NSHD) is a socially stratified sample of all births that occurred during one week in March 1946 across England, Scotland, and Wales. This cohort, based on 5362 births, has been followed prospectively 24 times across life from birth onwards with the latest follow-up in 2014–15 when study members were asked to complete a postal questionnaire at age 68 and then invited to have a home visit by a research nurse at age 69. Of the 2816 people in the target sample living in England, Scotland and Wales, 2370 (84%) completed a postal questionnaire [28]. Of the 126 study members living abroad who remain in contact with the study 83 (66%) returned a questionnaire. No attempt was made to contact the remaining 2420 study members: 957 (18%) had already died, 620 (12%) had previously withdrawn from the study, 448 (8%) had emigrated and were no longer in contact with the study, and 395 (7%) had been untraceable for more than five years. At age 69, study members found to be still living in Great Britain at the last known address or traced to a new address (n = 2698) were invited to have a home visit by a research nurse: 2149 (80%) completed a visit and a further 55 (2%) completed a brief postal questionnaire instead. In total, 2638 study members (94%) provided information on the postal questionnaire and/or completed a home visit. Data for the current study were collected primarily between the ages of 53 and 68–69 years.

2.2. Sleep quality

The Pittsburgh Sleep Quality Index has been validated for use in older general population samples [29]. It was included in the postal questionnaire at age 68, captured sleep quality during the previous month and was scored on a continuum from 0 to 21 with higher scores indicating poorer sleep quality. The scale also provides the option of categorising people as having poor or good sleep on the basis of their global score (cut-off $< =5/ > 5$) and deriving seven component scores for subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction (each scored from 0 to 3).

2.3. Positive and negative social support

An adapted version of the Close Person's Questionnaire [30] was included at ages 53, 60–64 (self-completed as part of a face-to-face interview) and 68 (by postal questionnaire). Study members were asked to nominate the person they had felt closest to in the last 12 months and respond to six follow-up questions about the quality of that relationship. In confirmatory factor analysis (Appendix A), we found that two scales, one capturing positive support and another capturing negative support, provided a good fit to the data at each age. In order to ensure an equal and comparable definition of both constructs (positive and negative support) over time, longitudinal measurement invariance was examined. The assumption of measurement invariance over time was met as the factor loadings of each indicator held fixed across age, that is, weak measurement invariance TLI > 0.90 and RMSEA < 0.05; Appendix B). Based on this, we derived a positive support score (possible range from 0 to 9) at each age by summing the three items with equal weights and we derived a negative support score in the same way.

2.4. Covariates

We controlled for covariates known to be related to sleep, namely education [31], marital status [32], household composition, caregiving [33], physical activity [34], obesity [34] and ill health [35]. All covariate information was provided by the study member at age 68, unless specified. Marital status was grouped as married/cohabiting or unmarried and number of people in household was grouped as one, two, or three plus in the household. Educational attainment was based on formal qualifications reported at age 26 and grouped into none, up to O-level or equivalent (typically gained at age 16), and A-level or higher education. Leisure time activity was grouped as inactive, less active (1–4 occasions taken part in sport or exercise in last month), and more active (5 or more occasions in last month). Limiting long-term illness was indicated if the study member reported an illness or health problem which had lasted for at least 6 months and had limited or severely limited usual activities. Information on the following three covariates was collected as part of a nurse visit at age 69. Body mass index was derived from weight and height measured by trained nurses. Study members also reported if they were providing care to a sick or frail person living in the same household. Affective symptoms were captured by the 28-item version of the General Health Questionnaire and those scoring 5 or more out of a total of 28 were classed as “cases” indicating probable presence of affective disorder.

2.5. Statistical analysis

The cross-sectional associations between total PSQI score and positive and negative support were modelled using linear regression in sequential models with adjustment for i) gender only, ii) mutually adjusted plus education, marital status, number of people in household, limiting illness, body mass index and caregiving, and additionally iii) affective symptoms. Since the total PSQI score is right-skewed, we repeated the models using a logarithm transformation of the global sleep quality score and found no material difference in the direction and strength of the associations, hence we present untransformed data for ease of interpretation. We tested for effect modification by gender and by identity of the close person. We additionally present estimates of the