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Loneliness and pathways to disease

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Abstract

Social isolation predicts morbidity and mortality from cancer, cardiovascular disease, and a host of other causes. The mechanisms by which the social world impacts on health are poorly understood, in part because of lack of specificity in the conceptualization and operationalization of relevant aspects of social relationships and physiological processes. Perceived social isolation, commonly termed loneliness, may represent a link between the epidemiological and biological levels of analysis. Research is presented that investigates loneliness as a social factor of importance in three predisease pathways: health behaviors, excessive stress reactivity, and inadequate or inefficient physiological repair and maintenance processes. Empirical evidence of autonomic, endocrine, and immune functioning suggests that the physiological effects of loneliness unfold over a relatively long time period. For cancer patients, interventions should be aimed at providing instrumental support for the immediate demands of the disease.

Keywords: Loneliness; Social isolation; Social support; Cancer; Cardiovascular disease; Health behaviors; Autonomic reactivity; Cortisol; Immunity; Sleep

1. Introduction

Social relationships are fundamental to emotional fulfillment, behavioral adjustment, and cognitive function. They can also be severely challenged by the diagnosis, treatment, and progression of cancer (Rokach, 2000; Spiegel, 2001). Recent research has shown that emotional closeness in relationships increases with age (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Fung, Carstensen, & Lang, 2001). Yet the number of social relationships decreases and social events triggering loneliness continue in older adults. Physical aging and diminished resilience enhance the likelihood that these psychosocial challenges could leave older adults vulnerable to feelings of loneliness, dysphoria, elevated and prolonged neuroendocrine stress responses, and ill health. Accordingly, social isolation predicts morbidity and mortality from broad-based causes in later life, even after controlling for health behaviors and biological risk factors (House, Landis, & Umberson, 1988).

Several demographic changes make it important to identify the underlying mechanisms by which social isolation might contribute to poor health. Chronic diseases (e.g., cancer, cardiovascular disease, affective disorders, drug or alcohol abuse, chronic obstructive pulmonary disease, sleep disorders, diabetes, and dementia) are the most frequent sources of complaints and the largest causes of morbidity and mortality in older adults. Life expectancy has increased in the US, increasing dramatically the number of older adults, individuals who are at risk for costly chronic diseases. The costs of medical care have also continued to rise more rapidly than inflation or the GNP, and a disproportionate amount of medical costs goes to the treatment of aging-related disorders. By the early 1990s, when approximately 11% of the population was over 65 years of age, 36% of all hospital stays and 48% of total days of

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doctor care were for individuals aged 65 or over (Luskin & Newell, 1997).

The mechanisms by which the social world impacts on health have been elusive, in part because social isolation is associated with broad-based morbidity and mortality rather than with the etiology of a specific disease, in part because the term social isolation includes multi-farious aspects of the social world (e.g., marital status, membership in voluntary associations), in part because the effects of social relationships on long-term morbidity and mortality appear to unfold over years, and in part because mapping directly from the aggregate social epidemiological level of analysis to the modulation of regulated physiological processes within individuals ignores the complex processes that operate at intervening levels of organization.[1]

The health risk associated with *perceived* social isolation has been less well studied than that of actual social isolation but may help bridge the abyss between the extant epidemiological and biological levels of analysis.[2] Indeed, in a meta-analytic review, Uchino, Cacioppo, and Kiecolt-Glaser (1996) found that, if anything, perceived social connectedness or support was more strongly associated than was objective social support with lower levels of autonomic activity (e.g., lower resting blood pressure), better immunosurveillance (e.g., greater natural killer cell lysis), and lower basal levels of stress hormones (e.g., urinary catecholamines). Extending this work to health outcomes, low perceived social support and high hostility significantly increased the odds of carotid artery lesions among high risk women even after controlling for age, education, body mass index, smoking, drinking, and metabolic rate (Knox et al., 2000). In a study of 514 women requiring a breast biopsy after mammogram screening, those who had experienced a recent highly threatening life stressor and lacked intimate emotional social support were at nine times the risk of developing breast cancer (Price et al., 2001).

To date, only one prospective study has examined the health outcomes associated specifically with loneliness. Herlitz et al. (1998) reported that among 1290 patients who underwent coronary artery bypass surgery, ratings of the statement, "I feel lonely," predicted survival at 30 days and 5 years after surgery even after controlling statistically for preoperative factors known to increase mortality (see, also, Seeman, 2000). Cancer patients are particularly prone to feelings of loneliness (see Rokach, 2000), and loneliness is a major factor in the mental health of cancer survivors (Boer, Elving, & Seydel, 1998). Whether loneliness plays a role in physical health outcomes within this population is unclear. Suggestive evidence supporting a possible link between loneliness and cancer was provided by Fox, Harper, Hyner, and Lyle (1994), who found that loneliness measured prior to a mammogram screening was higher among women who later were diagnosed as having breast cancer relative to women who were proclaimed disease-free. Our purpose here is to review research that investigates loneliness as a social factor of potential importance in the link between stress and disease.

2. Predisease pathways

Health behaviors are a major determinant of long-term health, and stress can undermine a healthful lifestyle (Institute of Medicine Committee on Health & Behavior, 2001). Social relationships can indirectly affect health by influencing lifestyle variables, health behaviors, and appropriate and timely utilization of healthcare (i.e., "direct effects hypothesis," Cohen & Wills, 1985). Indeed, lacking supportive social ties, lonely individuals have been hypothesized to engage in fewer health-promoting behaviors and more health-compromising behaviors (cf. Seeman, 2000).

A second putative predisease pathway is repeated or excessive catabolic action in response to stressors. Physiological activation in response to stressors is beneficial up to a point, but excessive activation may have hidden costs (Lithgow & Kirkwood, 1996). Because the metabolic requirements of psychological stressors are often minimal, the metabolic support provided by strong physiological reactivity may not be necessary for effective coping. Instead, disproportionate physiological responses may take a toll on homeostatic processes and physiological adaptive capacities and health across the lifespan. Supportive social relationships have the capacity to moderate stress responses indirectly through, for example, the receipt of practical assistance in times of need (i.e., "stress-buffering hypothesis," Cohen & Wills, 1985). Again, deficiencies in perceived social ties mean that the physiological systems of lonely individuals may absorb more of the impact of stressors encountered in daily life.

[1] In discussing the challenges of multi-level integrative research of this kind, Cacioppo and Berntson (1992) described the corollary of proximity, which states that mapping relations across levels of organization becomes more complex as the number of intervening levels increases. This increased complexity reflects the fact that many mappings are many-to-many across proximal levels of organization. Consequently, the mapping across diverse levels of organization becomes more tractable when the mapping proceeds across proximate levels of organization (Cacioppo & Berntson, 1992).

[2] Perceived social isolation forms the dominant factor underlying the UCLA loneliness scale (Adams, Openshaw, Bennion, Mills, & Noble, 1988; Russell, Peplau, & Cutrona, 1980). As such, loneliness is not so much an objective deficit in social ties as it is a perceived discrepancy between desired and actual social relationships (Jylhä & Jokela, 1990; Peplau & Perlman, 1982).