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Social Network, Social Support, and Loneliness in Older Persons With Different Chronic Diseases

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Objectives: This study examines whether patterns of social network size, functional social support, and loneliness are different for older persons with different types of chronic diseases. **Methods:** In a community-based sample of 2,788 men and women age 55 to 85 years participating in the Longitudinal Aging Study Amsterdam, chronic diseases status, social network size, support exchanges, and loneliness were assessed. **Results:** Social network size and emotional support exchanges were not associated with disease status. The only differences between healthy and chronically ill people were found for receipt of instrumental support and loneliness. Disease characteristics played a differential role: greater feelings of loneliness were mainly found for persons with lung disease or arthritis, and receiving more instrumental support was mainly found for persons with arthritis or stroke. **Discussion:** The specifics of a disease appear to play a (small) role in the receipt of instrumental support and feelings of loneliness of chronically ill older persons.

Social network ties can be of particular significance for chronically ill people because they may serve both health-protective and coping

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functions (Berkman, 1985; Broadhead et al., 1983; Kaplan, Cassel, & Gore, 1977). Several epidemiological studies have pointed out the importance of a large social network for morbidity and mortality (Berkman & Syme, 1979; Penninx et al., 1997a; Vogt, Mullooly, Ernst, Pope, & Hollis, 1992). Especially in the case of chronic disease, the social network may provide the necessary support to enhance older persons' ability to live independently, which may constitute a cost-effective alternative to institutionalization.

Nevertheless, our insight into the actual social patterns among older persons with chronic diseases is incomplete. Some researchers found people with chronic diseases to have smaller social networks than people without chronic diseases (Arpin, Fitch, Browne, & Corey, 1990; Berkanovic & Hurwicz, 1990; Fitzpatrick, Newman, Lamb, & Shipley, 1988; Reed, McGee, Yano, & Feinleib, 1983; Vogt et al., 1992). These earlier studies, however, were mostly restricted to particular chronic diseases, such as arthritis (Berkanovic & Hurwicz, 1990; Fitzpatrick et al., 1988) or coronary heart disease (Reed et al., 1983). Moreover, the studies conducted mainly focused on structural social network characteristics. Other dimensions, such as the functional exchange of instrumental or emotional support and the perceived adequacy of support (e.g., measured by loneliness experience), hardly have been examined with regard to their association with chronic disease status.

There is some evidence that social network and support patterns are, at least partly, determined by the type of chronic disease. This may be due to differences in disease characteristics, which have a differential psychosocial impact (Moos & Schaefer, 1985). Some researchers indicated that disease characteristics, such as progression and visibility of symptoms (Tijhuis, 1994) and functional incapacitation (Fitzpatrick, Newman, Archer, & Shipley, 1991; Lyons, 1991), determine the support needed, given, received, and perceived by the patient to a great extent. Therefore, in understanding disease-specific differences and similarities in social network and support patterns, it is useful to be aware of these distinguishing characteristics.

Persons having diseases with much functional incapacitation, for example stroke with hemiplegia or arthritis, are shown to be less able to perform certain roles and tasks and require more instrumental support, whereas their possibilities to give instrumental support to others

are smaller (Janssen, 1992). As a result, their social relationships are more out of balance (Depner & Ingersoll-Dayton, 1988; Dowd, 1984). Furthermore, owing to difficulties in investing in one's social relationships and limited opportunities for making new contacts, individuals with functional incapacitation may have smaller social networks than those without functional incapacitation (Fitzpatrick et al., 1988; Schulz & Rau, 1985). This decrease concerns, in particular, relationships with friends and acquaintances rather than intimate relationships with partners and children, because the latter are more likely to persist due to strong positive concern, affection, and consensus (Adams, 1967; Fitzpatrick et al., 1988).

Likewise, the course of disease is a significant factor with distinct psychosocial impact. Progressive diseases, such as terminal cancer, fill the patient's social network members with continuous concern and make them aware of the possible consequences of the disease. The social network of persons with relatively constant-course diseases, such as stroke, myocardial infarction, and diabetes, is, after a sometimes long initial period of adaptation, faced with a change that is relatively stable and predictable over a considerable time span (Rolland, 1987). Patients with these diseases are shown to be satisfied with their support received (Irwin & Kramer, 1988; Kutner, 1987; Neuling & Winefield, 1988; Wilson et al., 1986). Lung disease (asthma and COPD), however, usually has an episodic course, with the result that the social environment is not continually aware of consequences or symptoms of the disease. This may sometimes be accompanied by mutual incomprehension in these patients (Williams, 1989). In sum, although some disease-specific differences in social network and support patterns can be anticipated, evidence supporting this disease specificity is largely lacking. The present study examines whether patterns of social network size, functional social support, and loneliness are different for older persons with different types of chronic diseases.

Method

Data were collected in the context of the Longitudinal Aging Study Amsterdam (LASA), a longitudinal, multidisciplinary research project focusing on predictors and consequences of changes in autonomy and well-being in the aging population (Deeg, Knipscheer, & van Tilburg, 1993). The cohort was originally recruited for the study "Living Arrangements and Social Networks of Older Adults" (LSN) ($N = 3,805$, response rate = 62.3%). A random sample, stratified by sex and age, was drawn from the registries of 11 municipalities in The Netherlands. Full details on the sampling procedure and response have been described before (Broese van Groenou, van Tilburg, de Leeuw, & Liefbroer, 1995; Penninx et al., 1997a). For LASA, the 3,805 LSN participants age 55 to 85 years were approached, and 3,107 (81.7%) took part in the face-to-face LASA interview. The interviews, carried out by 43 trained interviewers between September 1992 and September 1993, lasted on average 113 minutes and were tape recorded to control data quality. Of the LSN respondents who did not participate in LASA, 126 (3.3%) were deceased before approach, and 134 (3.5%) could not participate in the study because of severe physical or mental health problems. Furthermore, 394 (10.4%) refused to be interviewed, and 44 (1.2%) could not be contacted. The response rate was associated with age but not with sex. Older respondents tended to refuse to participate in the study more often ($p < .001$), and they also were more often ineligible for participation because of health problems ($p < .001$).

In the present analyses, respondents living in nursing or residential homes ($n = 126$) were excluded, because their social support is incomparable to that of independently living older people. Due to physical or mental frailty, 136 subjects took part in a shortened interview in which social networks and support were not measured. These subjects were older ($p < .001$) and more often reported a chronic disease ($p < .01$) than respondents obtaining the complete interview. Due to incomplete data, another 57 subjects were lost for further analyses, leaving a study sample of 2,788.

INSTRUMENTS

Chronic diseases. The presence of diseases was determined by asking the participants whether they had any of the following diseases: cardiac disease, peripheral vascular disease (of the abdominal aorta or the arteries of the lower limb), stroke (CVA), diabetes mellitus, lung disease (asthma or COPD), malignant neoplasms, and arthritis (rheumatoid arthritis or osteoarthritis). Participants were also asked whether they had any other chronic disease and, if they did, to indicate which disease. With this information, a category of "other major diseases" was computed, consisting of gastrointestinal diseases, serious kidney diseases, serious back and neck problems, endocrine diseases, and neurological diseases. Comparison of respondents' self-report disease data with data of their general practitioner yielded a satisfactory agreement. Kappa values were moderate for peripheral vascular disease and arthritis (0.3-0.4); substantial for stroke, lung disease, cardiac disease, and cancer (0.6-0.7); and excellent for diabetes mellitus (0.85) (Kriegsman, Penninx, van Eijk, Boeke, & Deeg, 1996). As some studies found the duration of disease to be associated with social support (Cassileth et al., 1984; Janssen, 1992), the duration of each specific disease was determined by asking from which age the respondent had had the specific disease.

Social network size. Social network size was measured using the procedure based on Cochran, Larner, Riley, Gunnarson, and Henderson (1990) and defined as the total number of network members with whom the respondent had important and regular contact. Network members of 18 years and older in seven domains (household members, children, other family members, neighbors, contacts through work and school, members of organizations, and others) were identified by name. Social network size was divided into number of family relationships (children, siblings, and parents) and number of nonfamily relationships (neighbors, friends, extended kin relationships, acquaintances, colleagues, and others).

Functional support exchanges. Functional support exchanged within social relationships was measured by the mean amount of

instrumental and emotional support received from and given to respondents' network members. Questions about support exchanges were asked about 10 network members (or less, if fewer members were identified) with whom contact was most frequent. The instrumental support received and given was measured by asking how often it had occurred in the previous year that the respondent received and gave help with daily chores in and around the house, such as preparing meals, cleaning the house, transportation, and small repairs. For measuring emotional support received and given, it was asked how often it was in the previous year that the respondent told his or her network member about personal experiences and feelings, and vice versa. Answer categories and values were *never* (0), *rarely* (1), *sometimes* (2), and *often* (3). As described before (Penninx et al., 1997a, 1997b), for all four support questions, the mean of the support exchanges across the various relationships was computed, ranging from 0 (*no relationships or all relationships are never supportive*) to 3 (*all relationships are often supportive*). To ensure comparable values of the support of respondents with and without a partner, only the support within the nine relationships other than with the partner was included in these aggregated measures. Because it might be of influence whether all network members are equally supportive or whether a couple or even one network member only is greatly supportive, the individuals' standard deviations on the emotional and instrumental support measures were computed. These variables reflect the diversity in the amount of support exchanged by the various network members. However, because preliminary analyses showed no univariate associations between these measures and the presence of specific chronic diseases, they were not subsequently included in the analyses.

Loneliness. Loneliness is the unpleasant experience that occurs when a person's network of social relationships is deficient in some important way, either quantitatively or qualitatively (Peplau, 1985; Perlman & Peplau, 1981). It can be treated as a cognitive assessment of the adequacy of one's social network and support (Sugisawa, Liang, & Liu, 1994). Loneliness is measured by the de Jong Gierveld loneliness scale (de Jong Gierveld & Kamphuis, 1985), ranging from 0 (*not lonely*) to 11 (*extremely lonely*). The scale consists of five positive items assessing feelings of belonging and six negative items

applying to aspects of missing relationships. An example of a negatively formulated item is, "I experience a sense of emptiness around me." An example of a positively formulated item is, "I can rely on my friends whenever I need them." The scale has been used in several surveys and proves to be a rather robust, reliable, and valid instrument (van Tilburg & de Leeuw, 1991). Also in our sample, it was a reliable and homogeneous instrument (reliability coefficient = .83, Loevingers H = .34).

Control variables. Age, sex, and years of education were shown to be associated with both disease and social variables; these variables were taken into account in all analyses. Data on sex and age were derived from the municipal registries. For education, the respondents were asked about their highest educational level attained, which was measured in number of years of education. As partner status represents many things besides the possibility of a supportive relationship, such as family income, social status, and opportunities for social interaction (Dean, Holst, Kreiner, Schoenborn, & Wilson, 1994), it has to be considered as a separate factor and should not be included in composite support measures. Therefore, in all analyses, partner status was included as a separate variable. For partner status, respondents scored positive when they were married or had someone they considered as their partner.

DATA ANALYSIS

Descriptive analyses were conducted to show the distribution of the demographic, health, and social variables in the study population. Analyses of covariance were performed to calculate adjusted means of social network size, functional support exchanges, and loneliness in subjects with no chronic disease and those with a specific chronic disease. Within the analyses of covariance, each specific disease category was individually compared with the "no disease" (reference) group, using the t statistics for comparing parameter estimates. In addition, to study the relative strength of the associations between the specific diseases and the social variables, multiple linear regression analyses were conducted in the total sample. In these analyses, the covariates and all specific chronic diseases were entered simultaneously,

using dummy variables for each disease (0 = disease absent, 1 = disease present). In this manner, specific "risk" diseases were traced that, when compared to other types of diseases, were relatively strongly associated with the social variables. Because weighting for sampling design (stratification by age and sex) did not change the results, unweighted data are presented.

Results

Table 1 presents the characteristics of the study sample, consisting of 1,362 men and 1,426 women. In all, 4.4% of the sample had no chronic disease, 37.4% had one disease, and 28.2% had two or more diseases. The most frequently reported disease was arthritis (34.6%); the least frequently reported disease was stroke (4.7%).

Except for the correlation between mean emotional support received and given ($r = .65$), all correlations between the seven social variables were below .20, illustrating that they can be considered as empirically distinct dimensions. Univariate analyses showed that age, sex, partner status, and years of education were significantly associated with both disease and social variables. Therefore, these variables were included as potential confounders in all analyses. None of the correlations between the duration of (specific) diseases and the social variables was significant. Also, when duration of disease was categorized in five different categories to examine a nonlinear association, no significant associations were found. Consequently, duration of disease was not further considered in the analyses.

Differences in social variables between persons with specific chronic diseases and those with no chronic diseases were evaluated by analyses of covariance (Table 2). With regard to social network size, no significant associations with chronic disease status could be demonstrated. The mean numbers of family and nonfamily relationships, adjusted for sex, age, education, and partner status, did not differ between people without a chronic disease and those with a specific chronic disease. Likewise, differences in emotional support received and given between persons without chronic diseases and those with a specific chronic disease were rather small. The only significant differences were found for diabetes patients (less emotional support

Table 1
Characteristics of the Study Sample

Demographic and health variables	
Gender	
Men (%)	48.9
Age (%)	
55-64 years	34.4
65-74 years	32.2
75-84 years	33.4
Presence of partner (%)	
Yes	69.4
Years of education	
M (*SD*)	8.87 (3.32)
Number of diseases (%)	
0 disease	34.4
1 disease	37.4
2 diseases	18.2
3 or more diseases	10.0
Specific diseases (%)	
Cardiac disease	19.2
Peripheral vascular disease	9.2
Stroke	4.7
Diabetes mellitus	7.2
Lung disease (asthma and COPD)	11.2
Cancer	8.8
Arthritis	34.6
Other major diseases	11.9
Social variables: *M* (*SD*)	
Social network size	
Number of family relationships	5.69 (3.83)
Number of non-family relationships	7.56 (6.67)
Functional support	
Instrumental support received	0.80 (0.73)
Instrumental support given	0.69 (0.72)
Emotional support received	1.72 (0.76)
Emotional support given	1.59 (0.83)
Loneliness	1.99 (2.48)

received than persons with no diseases) and arthritis patients (more emotional support given than persons with no diseases).

By contrast, instrumental support exchanges and loneliness were more clearly associated with the presence of specific chronic diseases. Although the differences were relatively small in view of the range of these measures, persons with stroke ($M = 0.92$), diabetes ($M = 0.90$), arthritis ($M = 0.85$), and "other major diseases" ($M = 0.92$) had

Table 2
Adjusted Means[a] of Social Network, Social Support, and Loneliness in Persons With No or With Specific Chronic Diseases

| | *N* | *Social Network Size* | | *Instrumental Support* | | *Emotional Support* | | |
		Family Relationships	*Nonfamily Relationships*	*Received*	*Given*	*Received*	*Given*	*Loneliness*
No chronic disease	958	5.75	7.68	0.73	0.76	1.73	1.57	1.74
Cardiac disease	334	5.57	7.53	0.84*	0.63**	1.74	1.60	1.99*
Peripheral vascular disease	256	5.39	7.49	0.84*	0.60**	1.72	1.54	2.37***
Stroke	130	5.45	7.03	0.92***	0.55***	1.77	1.52	2.12*
Diabetes mellitus	199	5.67	7.79	0.90**	0.59***	1.61*	1.55	2.01
Lung disease	310	5.52	7.53	0.82	0.64**	1.65	1.55	2.44***
Cancer	244	5.44	7.42	0.80	0.63**	1.77	1.63	2.00
Arthritis	963	5.59	7.70	0.85**	0.68**	1.76	1.66*	2.19***
Other major diseases	331	5.78	7.54	0.92***	0.65**	1.74	1.61	2.05*

a. Adjusted for age, sex, educational level, and partner status using analysis of covariance.
*$p < .05$. **$p < .01$. ***$p < .00$. *p* values are based on comparisons of the mean for each disease category with the mean for no disease.

Table 3

Standardized Linear Regression Coefficients Relating Demographics and Disease Variables to Social Network, Social Support, and Loneliness

	Social Network Size		Instrumental Support		Emotional Support		
	Family Relationships	*Nonfamily Relationships*	*Received*	*Given*	*Received*	*Given*	*Loneliness*
Age (years)	−.036	−.094***	−.010	−.287***	−.061**	−.057**	.066***
Sex (men = 0, women = 1)	.041*	.080***	−.086***	−.134***	.183***	.162***	−.054**
Partner (no = 0, yes = 1)	.129***	.062**	−.108***	.052**	−.049*	−.039	−.295***
Education (years)	−.104***	.206***	−.053**	.002	.141***	.106***	−.033
Specific diseases[a]							
Cardiac disease	−.009	.000	.015	−.033	.013	.008	−.009
Peripheral vascular disease	−.021	−.002	.006	−.024	−.003	−.020	.042*
Stroke	−.011	−.035	.029	−.035*	.017	−.016	.007
Diabetes mellitus	.004	.012	.034	−.030	−.034	−.013	−.005
Lung disease	−.012	−.002	−.001	−.021	−.033	−.020	.057**
Cancer	−.019	−.007	−.008	−.021	.021	.018	−.002
Arthritis	−.017	.015	.053**	−.011	.035	.065***	.053**
Other major diseases	.008	.001	.063***	−.024	.012	.014	.010

a. For each chronic disease category: present (1) vs. absent (0).

*p < .05. **p < .01. ***p < .001.

significantly higher adjusted means for instrumental support received than persons without any disease ($M = 0.73$). This did not apply to persons with lung disease and cancer. Furthermore, the presence of each specific chronic disease was associated with less instrumental support given. Persons with stroke ($M = 0.55$) and diabetes ($M = 0.59$) reported the lowest mean instrumental support given. Finally, there were some differences in loneliness across the different disease groups. Especially people with lung disease ($M = 2.44$), arthritis ($M = 2.19$), and peripheral vascular disease ($M = 2.37$) experienced more loneliness, whereas diabetes and cancer patients did not differ from people without a disease ($M = 1.74$).

To test the unique contribution of each specific disease, multivariate linear regression analyses including all 2,788 respondents were conducted in which, controlled for age, sex, education, and partner status, all specific diseases were entered simultaneously (Table 3). Again, none of the specific chronic diseases was associated with a significantly smaller number of family and nonfamily relationships. As to instrumental support, these analyses confirmed that persons having arthritis ($\beta = .053$) or other major diseases ($\beta = .063$) received significantly more instrumental support than people without diseases. The mean instrumental support given within relationships was negatively associated with stroke ($\beta = -.035$). As to emotional support, none of the chronic diseases was associated with emotional support received, but arthritis patients reported that they gave significantly more emotional support to others ($\beta = .065$). Finally, the regression results for loneliness confirmed that especially persons with peripheral vascular disease ($\beta = .042$), lung disease ($\beta = .057$), and arthritis ($\beta = .053$) had a higher risk for feelings of loneliness.

Discussion

This study represents a further step toward explication of disease-specific social network, social support, and loneliness patterns by comparing these variables in healthy persons and persons with various chronic diseases. Our study indicates that having a chronic disease affects instrumental support exchanges and feelings of loneliness but does have less impact on persons' social network size or exchanges of

emotional support. For social network size, our findings were in contrast with those in younger patients, showing that contacts with diffuse relationships, such as with friends and acquaintances, were negatively affected (Fitzpatrick et al., 1988, 1991) but in line with findings of Weinberger, Hiner, and Tierney (1987). Also, in a 3-year longitudinal study among persons older than age 65 years, prevalent major illnesses were not important in determining the decline in social relationships (Cerhan & Wallace, 1993). Probably, consequences of a chronic disease for the social network are less severe for older people because they are likely to have more long-standing, stable relationships (Fischer, 1982). Moreover, illness in old age is more normative and usual in that part of the life cycle than in younger age and may, therefore, be less disruptive (Neugarten, 1976).

For emotional support, the association with chronic disease status was also rather small. This might be explained by the fact that on the basis of age and experience, older patients may have developed more effective skills with which to manage stressful life events and to reduce emotional distress (Schulz & Rau, 1985). Their perspectives and expectations may be more easily adaptable to illness and death than is the case for younger patients. Also, emotional support may be greatest in the early stages of an illness and may dissipate if the illness is prolonged (Tempelaar et al., 1989), but in our community-based sample, only a few people reported a very recent onset of their chronic condition. In addition, it has been suggested that emotionally supportive relationships of chronically ill older persons may reflect those of the overall population because they represent not the demands of particular stress, such as a disease, but rather the manifestations of enduring personality constructs and capacities (Arpin et al., 1990; Cassileth et al., 1984). Finally, it should be mentioned that nonresponse in our sample was higher among the oldest age groups and associated with physical ill health, which may have caused a weakening of the associations studied. The only clear association with emotional support was found for arthritis patients. These patients reported more emotional support given when compared to persons with other chronic diseases and persons with no disease. Because arthritis is associated with much receipt of instrumental support, the finding of giving more emotional support might be due to the attempts of arthritis patients to retain reciprocity in their relationships (Gouldner, 1960).

The most obvious differences between persons with and without chronic diseases were found for exchanges in instrumental support and feelings of loneliness. The chronically ill had relationships that were less reciprocal with regard to instrumental support due to both less giving and more receiving of instrumental support within social relationships. Our findings that chronically ill persons receive more instrumental support and are more lonely are largely due to some specific types of chronic diseases, because associations were found mainly for a few types of chronic diseases. This supports our initial hypothesis of a disparity in social support among different patients: The specifics of a disease seem to play a differential part in the social support of chronically ill older persons. Compared to healthy persons, more instrumental support was received by diabetes and stroke patients and, most clearly, by patients with arthritis and other major diseases, which largely consisted of patients with serious chronic back problems and neurological diseases (e.g., Parkinson's disease). The most likely explanation for these findings is that these diseases accompany more functional incapacitation than diabetes, cancer, lung disease, peripheral vascular disease, and heart disease (Boult, Kane, Louis, Boult, & McCaffrey, 1994; Johnson & Wolinsky, 1993). Previous analyses of the LASA study confirmed that arthritis and stroke were indeed the diseases with the strongest associations with physical disability (Kriegsman, Deeg, van Eijk, Penninx, & Boeke, 1997). Taken together, our findings suggest that the extent of functional incapacitation is likely to be the most important determining disease characteristic for receiving more instrumental support and, consequently, for less reciprocity of instrumental support within relationships.

The distinguishing influence of chronic diseases on feelings of loneliness may partly be explained by differences in the course of the various chronic diseases. For diseases that are progressive or relatively stable (e.g., cancer, diabetes, cardiac disease, and stroke), patients did not differ in feelings of loneliness compared to healthy persons. These findings are consistent with the prior observations of Grant, Patterson, and Yagher (1988); Irwin and Kramer (1988); Kutner (1987); Neuling and Winefield (1988); and Wilson et al. (1986). More severe loneliness, however, was experienced in persons with peripheral vascular disease, lung disease, and arthritis, suggesting a less favorable perceived adequacy of support among these persons.

The episodic course of these diseases may have played a part in these findings. Because of the alternation of periods with and without disease symptoms, the social environment of persons with these diseases is not continually confronted with, and conscious of, the disease (Tijhuis, 1994). This might lead to relatively little appeal to empathy and identification (Dudley, Wermuth, & Hague, 1973; Rolland, 1987; Williams, 1989). Furthermore, due to the episodic course, there may be a wide variability in the support needed, which requires a more flexible attitude of the social network. This may sometimes lead to mutual incomprehension and frictions, because of which these patients may not attain their desired degree of intimacy and thus may experience more feelings of loneliness.

The value of the present study lies in the unique opportunity to compare social network, social support, and loneliness patterns in people with and without different chronic diseases. Our study indicates that, unlike social network size and exchanges of emotional support, exchanges of instrumental support and feelings of loneliness were different for persons with and without chronic diseases. The specifics of disease seem to matter in this respect. Especially older people with lung disease or arthritis had a higher risk for feelings of loneliness, whereas mainly older people with arthritis or stroke had a higher risk of receiving more instrumental support. This implies that the awareness of the disease specifics—for example, much functional incapacitation and reduced illness controllability—can be helpful for tracing older persons who are at risk for experiencing a more profound impact on their social relationships. As we understand more about the different disease specifics, we will be in a position to plan more effective interventions to facilitate and encourage the supportive functions of older persons' social networks.

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