Assessing social networks among elderly populations

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OVER THE PAST decade, considerable evidence has been accumulated showing that social networks influence health. What is most surprising about these findings is that they were obtained despite a lack of clarity in definitions of social networks and an inconsistency in measurements of health. As a reflection of this lack of clarity, researchers have variously referred to the social network construct as social supports, informal supports, social networks, and social connectedness. Furthermore, mortality rates, various morbidity indicators, and several different psychological well-being measures have been used as measures of health.

Although the diversity of these studies adds extra significance to the convergence of their findings, Berkman[1] suggests that any further advancement in understanding the relationship between social networks and health will probably have to await a refinement of the instruments used to measure social networks. To that end, this article briefly reviews the literature on social networks and health, then presents a new composite scale for measuring social networks among elderly populations, and examines the relationship of this social network scale to three distinct types of health indicators (subsequent hospital use, life satisfaction, and a checklist of health-related behaviors) to demonstrate the scale's potential usefulness among elderly populations. The new scale is a refinement of the Berkman-Syme Social

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Network Index,[2] which was developed for use in the general adult population.

THE LINK BETWEEN SOCIAL NETWORKS AND HEALTH

Berkman and Syme[2] were among the first to document a significant relationship between social networks and mortality rates. Other investigators have also supported the conclusion that an individual's social relationships are generally good for both the mental and physical health of that person.[3-7] Particularly among elderly populations, maintaining adequate social networks appears to be a health-related practice whose significance may be on par with that of regular exercise or not smoking.[8]

The most common explanation for an association between health and social networks states that social ties provide a buffering effect from stress, thereby reducing the vulnerability of an individual to stress-related illnesses.[9,10] Other theories have also been proposed to explain this relationship, however. For example, Berkman[11] suggested that the absence of social ties may have a direct physiologic effect, increasing the vulnerability to morbidity and mortality. Cohen and Syme[12] indicated that social networks may provide essential support at times of illness, thereby facilitating adaptation to infirmity and speeding recovery.

Social networks may also influence health status by encouraging compliance with other health-promoting behaviors and the cessation of bad practices.[11-13] For example, social networks can play an important role in helping an elderly person make life-style changes (eg, lose weight or start an exercise program). Additionally, an elderly person's social network may provide information and advice about health alternatives. For example, family members or friends may encourage and otherwise facilitate an elderly person's seeking timely medical attention for specific health problems. Because of the importance of social networks to the health of elderly persons, Crawford[13] advised that health professionals should regularly assess a client's social network and employ support network strategies in clinical practice.

THE NEED FOR BETTER MEASURES OF SOCIAL NETWORKS

Appropriate instruments for measuring social networks within elderly populations are difficult to find. Very few social network scales have been developed specifically for the elderly. Therefore, assessment instruments with demonstrated merit among younger populations have often been applied to older populations without consideration of whether such scales perform in the same way among the latter as they did among the former. For example, marital status has sometimes been used as an indicator of social connectedness among general adult populations, but it has limited utility for the elderly, as the distribution of marital status is quite different among the elderly than among younger adults. Widowhood, a more common marital state for elderly than for younger persons, seems to have a very different impact on the social

network structures of those adults who are widowed at a younger age than on those widowed later in life.[14]

The above example is indicative of another problem; researchers have tended to select a single item as an indicator of social networks. Single-item indicators are, however, generally unable to capture enough of an individual's social networks from which to evaluate and are further handicapped by failing to note whether a person might be compensating in one area for deficiencies in another. Furthermore, researchers have used a varied and inconsistent list of single-item indicators for social networks. For example, persons with extremely limited social networks have been defined as those who have no family in the area, no children, no meaningful contact with family or community, limited contact with family and friends, no confidant, less than three social contacts a day, and only casual contact or no contact. While there has been a growing tendency for social gerontologists to use the indicator "no or minimal contact with others," health service researchers are more apt to use "living alone" as their indicator of social isolation.[15-17]

Use of the indicator, "living alone," demonstrates many of the conceptual difficulties with single-item indicators. Although living alone may be a crude indicator of social networks, it is also a gross indicator of advanced age because older people are more likely to live alone. Living alone is also an indirect measure of good functional health, because an individual must be able to satisfy personal care needs in order to live alone successfully. Also, it cannot be assumed that elderly persons who live alone are isolated, because many who live alone get out of their homes often and have regular social contact with neighbors, friends, and relatives. Most other single-item indicators of social networks encounter similar problems with face validity.

Although the solution of these problems has generally been to develop composite measures of social networks, they can present other, equally important problems. Composite measures are generally more reliable than single-item indicators or indexes constructed from just a few items,[18] but they can be too lengthy and unwieldy for many research and clinical applications. For example, Mangen and Peterson[19] have accumulated an impressive list of social network measures that are very suitable for settings where social roles and participation are the major consideration. However, most of the listed instruments are too long or too narrowly focused for applications where there is merely a need to control for social networks or to screen for possible risk factors. Although researchers and clinicians have come to recognize the importance of social networks to health, any systematic assessment of social networks that gets in the way of the major goals of a research study or a health program will not be adopted. Specifically, no social network scale will gain much acceptance if it takes too long to administer or has too complicated an algorithm for scoring.

ISSUES IN DEVELOPING A COMPOSITE MEASURE OF SOCIAL NETWORKS

Ell[6] argued that, as a starting point for greater clarity and increased consistency

of measurement, researchers should distinguish social supports from social networks, as the overlapping of the terms only creates confusion. Ell defined social networks as including all of an individual's social contacts. Social networks can be "described along structural and interactional dimensions including size, source of ties, member homogeneity, frequency of contacts, and opportunity for reciprocal exchange of support."[6(p134)]

Thoits[10] indicated that a social support system is that subset of persons within an individual's social network on whom that individual can rely for support. Social support is a more complex and difficult construct to measure than social networks because any measure of social support must assess both a need for support as well as evidence of an exchange of instrumental or emotional support in response to that need. The absence of support may imply either that none was needed or that none was available. Any measure of social networks or support must clarify which construct is being measured: social networks or social supports.

Another important distinction to be made is that between family networks and friend or peer networks. Many of the early gerontologic studies emphasized what Ell called social supports, and these studies concentrated on the family, because it is usually the major source of instrumental support at times of infirmity.[20] However, recent studies have suggested that friends or peers may be more important than family when it comes to providing emotional support to an elderly person.[21] Indeed, Larson and associates recently noted that "one of the major puzzles found in the gerontology literature is the apparent superiority of friends over family as sources of psychological well-being."[22(p117)] Thus, any assessment of social networks should distinguish interaction with friends from that with family.

Other factors have also been suggested as being especially important to social networks. For example, some researchers have suggested that size of a network was an important consideration, whereas others have stressed quality.[23] Confidant relationships have also been suggested as being especially important to elderly persons.[24] Social exchange theorists have indicated that reciprocity of helping behavior is important to network strength and durability.[13,23]

A COMPOSITE MEASURE OF SOCIAL NETWORKS AMONG ELDERLY POPULATIONS

A composite social network scale that addresses many of these issues was developed by Lubben,[25] who modified the Berkman-Syme Social Network Index (BSNI) specifically for use with older populations. The BSNI consists of four major components:

1. marital status;
2. nature of relationships with relatives and friends;
3. church membership; and
4. membership in other organizations and clubs.

However, Lubben noted that there was very limited variation in the organizational participation and marital status variables among an elderly population. Therefore, he dropped these items but kept the extensive BSNI inquiry regard-

ing the nature of relationships with family and friends. Lubben also developed a more simplified scoring algorithm than the quite complicated one used for the BSNI. For example, the BSNI uses a contingency table to merge marital status scores with scores on the relative and friends component to get an intermediate index of social contact. Church and group membership are used as a final adjustment to scores and matter only for respondents with low scores on the intermediate index.

The BSNI collapses scores into only four categories, whereas Lubben's Social Network Scale (LSNS) records more distinct levels of social interaction with relatives and friends. The LSNS score is obtained from an equally weighted sum of ten items, each of which range in value from 0 to 5. Therefore, the total LSNS scores can range from 0 to 50. The ten components that make up the LSNS are shown in the box and the actual items are listed in the appendix. Three items deal with family relationships (size of active family network, size of intimate family network, and frequency of contact with a family member). There are three similar items on the LSNS dealing with relationships with friends. The four remaining items address interdependent relationships, such as having a confidant and the reciprocity of giving help. All ten items of social networks are highly intercorrelated, which indicates that they are tapping into a common construct (Cronbach Alpha = 0.70).

THE STUDY SAMPLE

Data for the present analysis were drawn from the California Senior Survey (CSS), a random sample of elderly Medi-Cal (Medicaid) recipients from eight representative communitites within California. CSS respondents were interviewed in person in 1982 and were paid $15 for participating in the interview. Details of the sampling method and the CSS

Composite Measure of Social Networks, Lubben Social Network Scale (LSNS)*

Family networks	Friends networks	Interdependent social supports
Number seen monthly	Number feels "close to"	Has a confidant
Frequency of social contact	Number seen monthly	Is a confidant
Number feels "close to"	Frequency of social contact	Relies upon and helps others
		Living arrangements

*The LSNS reported a Cronbach Alpha = 0.70

respondent characteristics have been extensively published elsewhere.[25-27]

The present analysis was restricted to noninstitutionalized CSS respondents (N = 1,037). Reflecting California's ethnically diverse population, the sample included a sizable proportion of blacks (17%), Hispanics (13%), and Asians (12%), although the majority (58%) was white. There were approximately two women for every man. The average age was 77.2 years, and a large majority (61%) of the respondents lived alone.

Life satisfaction was measured with the Life Satisfaction Index (LSI) as revised by Adams,[28] who suggested dropping two items from the original LSI, thus creating the LSI-A, which has been used in large national surveys of elderly populations.[29] Health practices were measured using the "Alameda 7," a list of seven practices identified by Belloc and Breslow[30] as being important to health status.

These seven health habits were defined as

- having never smoked;
- drinking less than five drinks at one sitting;
- exercising;
- sleeping 7 to 8 hours a night;
- maintaining desirable weight for height;
- avoiding snacks; and
- eating breakfast regularly.

Inquiry regarding compliance with these practices has been included in the National Health Interview Surveys (NHIS) of the adult population in the United States in 1977, 1983, and 1985.[31]

Due to the ages of the people in the sample, this study tolerated somewhat lower levels of exercise than did the original Belloc and Breslow study. Engaging in some form of exercise (walks, gardening, and so on) at least once a week was considered a good health practice. The present study also tolerated slightly heavier body weights than did Belloc and Breslow. The standards for desired height/weight balance used here conformed with a more recent study from the Human Population Laboratory.[32] An elderly person whose weight was between 10% under and 30% over the standard on the Metropolitan Life Tables[33] was considered to have desired weight control.

The results

The present study tested the relationship between the LSNS and three health indicators. The first health indicator was a dichotomous variable indicating whether a respondent was hospitalized for six or more days in the year following the survey. The figure of six days was selected because it was slightly higher than the average length of stay for all respondents (mean length of stay, 5.2 days). Slightly more than one fifth (21%) of the sample experienced such hospital stays. The LSI-A was used as a measure of mental health, and the average LSI-A score was 22.2 (standard deviation, 7.6). The Belloc-Breslow checklist of seven health practices was the final health indicator used, and the average number of good health practices found was 4.7 (standard deviation, 1.2). The average LSNS score was 25.1 (standard deviation, 9.6).

The LSNS correlated significantly with all three health measures. The relation-

ship of social networks was strongest with the mental health measure ($r = 0.21$; $p < 0.001$). The next strongest relationship was with the Belloc-Breslow checklist ($r = 0.13$; $p < 0.001$), followed by the hospital use variable ($r = 0.10$; $p < 0.01$). The association between the LSNS and all three health measures continued to be significant even when multivariate models were adjusted for age, self-reported health at time of survey, and any hospitalizations during a six-month period preceding the interview.

DISCUSSION

The present analysis builds upon Crawford's argument that social network assessments ought to be a regular part of a health professional's practice. However, few valid and reliable instruments exist for assessing social networks among elderly populations. To overcome this deficiency and to facilitate the implementation of Crawford's recommendation, a new social network assessment scale was presented. The new scale, the LSNS, provided a composite measure of social networks and it demonstrated adequate internal consistency for research purposes. The LSNS also correlated significantly with selected health variables.

Because the LSNS is built upon the original Berkman-Syme inquiry, it is not surprising that it is also significantly correlated with the BSNI. However, the LSNS is better than the BSNI for use with elderly persons, because the LSNS eliminated BSNI items that have very limited variation within elderly populations. The LSNS also gives greater importance to subtle differences in the nature and extent of social interaction with family and friends than the BSNI, which enables the LSNS to have greater variation in scores, thereby increasing its explanatory power in research studies. Finally, the LSNS has a much simpler scoring algorithm than the BSNI.

The LSNS can be readily adapted for use in practice settings, because it is easy to score and takes only five to ten minutes to administer. Moreover, many of the LSNS items are already included in many geriatric assessments, thereby making it easier to incorporate the remainder of the LSNS into such assessment instruments. The LSNS is currently being used by California's Multipurpose Senior Services Program (MSSP), which serves more than 4,000 elderly persons. The LSNS has also been included in a number of research instruments at the University of California, Los Angeles (UCLA), such as the UCLA Neuropsychiatric Institute, where it is being used to assess the social networks of depressed elderly patients.

In clinical practice, a cutoff point is often desired for screening at-risk populations. Although more research needs to be done, Lubben and associates[8] have shown that scores in the lower quartile of the LSNS are associated with significantly increased risks of extended hospital stays. Using this standard, scores below 20 (out of a possible 50 points) on the LSNS would qualify as a preliminary cutoff point for screening those elderly who are apt to be at greater risk of extremely limited social networks. Crawford's network strategies,[13] including linking the elderly client with potential formal

and informal supports, would seem most appropriate for those elderly persons identified as high risk by the LSNS.

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This article has briefly recounted a growing recognition of the importance of social networks to health. As gerontologists and geriatricians begin to identify the means to increase *active* life expectancy, rather than mere life expectancy, it is likely that an elderly person's social networks will be shown to be even more indispensable to health and successful aging.[34,35] However, the importance of social networks will not be fully documented nor understood unless better measures, such as the LSNS, are implemented in research and clinical settings.

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APPENDIX
Lubben Social Network Scale

Family networks

Q1. How many relatives do you see or hear from at least once a month? (NOTE: Include in-laws with relatives.) Q1 ____

0 = zero	3 = three or four
1 = one	4 = five to eight
2 = two	5 = nine or more

Q2. Tell me about the relative with whom you have the most contact. How often do you see or hear from that person? Q2 ____

0 = < monthly	3 = weekly
1 = monthly	4 = a few times a week
2 = a few times a month	5 = daily

Q3. How many relatives do you feel close to? That is, how many of them do you feel at ease with, can talk to about private matters, or can call on for help? Q3 ____

0 = zero	3 = three or four
1 = one	4 = five to eight
2 = two	5 = nine or more

Friends networks

Q4. Do you have any close friends? That is, do you have any friends with whom you feel at ease, can talk to about private matters, or can call on for help? If so, how many? Q4 ____

0 = zero	3 = three or four
1 = one	4 = five to eight
2 = two	5 = nine or more

Q5. How many of these friends do you see or hear from at least once a month? Q5 ____

0 = zero	3 = three or four
1 = one	4 = five to eight
2 = two	5 = nine or more

Q6. Tell me about the friend with whom you have the most contact. How often do you see or hear from that person? Q6 ____

0 = < monthly	3 = weekly
1 = monthly	4 = a few times a week
2 = a few times a month	5 = daily

Confidant relationships

Q7. When you have an important decision to make, do you have someone you can talk to about it? Q7 ____

Always	Very Often	Often	Sometimes	Seldom	Never
5	4	3	2	1	0

Q8. When other people you know have an important decision to make, do they talk to you about it? Q8 ____

Always	Very Often	Often	Sometimes	Seldom	Never
5	4	3	2	1	0

Helping others

Q9a. Does anybody rely on you to do something for them each day? For example: shopping, cooking dinner, doing repairs, cleaning house, providing child care, etc.

NO—if no, go on to Q9b. YES—if yes, Q9 is scored "5" and skip to Q10

Q9b. Do you help anybody with things like shopping, filling out forms, doing repairs, providing child care, etc.? Q9 ____

Very Often	Often	Sometimes	Seldom	Never
4	3	2	1	0

Living arrangements

Q10. Do you live alone or with other people? (NOTE: Include in-laws with relatives.) Q10 ____

5 Live with spouse
4 Live with other relatives or friends
1 Live with other unrelated individuals (e.g., paid help)
0 live alone

TOTAL LSNS SCORE: ____

SCORING:

The total LSNS score is obtained by adding up scores from each of the ten individual items. Thus, total LSNS scores can range from 0 to 50. Scores on each item were anchored between 0 and 5 in order to permit equal weighting of the ten items.