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THE MOS SOCIAL SUPPORT SURVEY

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Abstract—This paper describes the development and evaluation of a brief, multidimensional, self-administered, social support survey that was developed for patients in the Medical Outcomes Study (MOS), a two-year study of patients with chronic conditions. This survey was designed to be comprehensive in terms of recent thinking about the various dimensions of social support. In addition, it was designed to be distinct from other related measures. We present a summary of the major conceptual issues considered when choosing items for the social support battery, describe the items, and present findings based on data from 2987 patients (ages 18 and older).

Multitrait scaling analyses supported the dimensionality of four functional support scales (emotional/informational, tangible, affectionate, and positive social interaction) and the construction of an overall functional social support index. These support measures are distinct from structural measures of social support and from related health measures. They are reliable (all Alphas >0.91), and are fairly stable over time. Selected construct validity hypotheses were supported.

Key words—social support, reliability and validity

INTRODUCTION

The importance of interpersonal relationships to our lives has become increasingly clear. Both seeking and receiving help from other people is a major form of coping activity [1]. The availability of someone to provide help or emotional support may protect individuals from some of the negative consequences of major illness or stressful situations [2]. Interest in the concept of social support has increased dramatically over the last few years due to the belief that the availability of support may impact favorably on a person's health and emotional well-being. Although we don't know yet how support improves health, there is some empirical evidence that has established its beneficial effects [3–6]. For those trying to understand the etiology and course of chronic diseases, social support must be considered as an important factor that may affect a patient's functioning and well-being. The challenge is to determine how social support contributes to health [7]. One approach to this issue is to break social support into its component parts and evaluate how different dimensions of social support relate to a variety of health outcomes.

Methods used to assess social support are quite varied due to different definitions of social support and to the lack of a clear conceptualization of the concept [8–11]. In recent years, however, investigators have attempted to measure the functional components of social support [11–19] under the belief that the most essential aspect of social support is the perceived availability of functional support [10, 20, 21]. Functional support refers to the degree to which interpersonal relationships serve particular functions. The functions most often cited are (1) emotional support which involves caring, love and empathy, (2) instrumental support (referred to by many as tangible support), (3) information, guidance or feedback that can provide a solution to a problem, (4) appraisal support which involves information relevant to self-evaluation and, (5) social companionship, which involves spending time with others in leisure and recreational activities [22–24].

A second approach to social support measurement has focused on the structure of interpersonal relationships. Structure refers to the existence and quantity of social relationships (e.g. marital status, group membership, the number of friends one has), and the interconnectedness of a person's social relationships or social network (e.g. the degree to which a person's friends know each other). This type of social support is most frequently measured in terms of the existence of or contact with potentially supportive persons [8, 25, 26]. One problem with this approach is that contact may be due to factors uncorrelated with support, such as need for contact or how busy a person is with work or other activities.

In spite of the numerous scales and questionnaires that purport to measure functional and structural aspects of social support, recent reviews of published social support measures have concluded that the psychometric properties for the majority of measures have not been convincingly documented [19, 27–29]. Not only do they differ in terms of length, focus, approach and the types of support that are evaluated, evidence for reliability and validity is often based on information from select samples, i.e. college students [18]; multidimensional measures are, in some cases, represented by single items, which are less reliable than multi-item scales [17]; and the length of many inventories may be burdensome for chronically ill patients [18]. There appears to be agreement on the need for psychometrically tested instruments that are multidimensional, applicable to patient populations (who may have greater than average needs for various forms of social support), yet brief enough to minimize respondent burden [10, 17, 21, 29].

This paper describes the development and evaluation of a brief, self-administered, multidimensional, social support survey that was developed for patients

in the Medical Outcomes Study (MOS), a two-year longitudinal study of the process and outcomes of care for patients with prevalent and treatable chronic conditions. In addition, we provide evidence related to the dimensionality of the MOS social support survey, i.e. the extent to which the various functions of support are empirically distinct.

METHODS

Study population and data collection

The data are from patients participating in the Medical Outcomes Study (MOS), an observational study of variations in physician practice styles and patient outcomes in one of three different systems of care: health maintenance organizations (HMOs), large multispeciality groups (LMSGs), and solo fee-for-service practice. The sampling design was a staged process involving first selecting sites, then settings within sites, clinicians within settings, and patients from the practices of those clinicians (see Rogers, McGlynn, Berry, *et al.* [30], for a detailed description of sampling methods and population characteristics). Briefly, three study sites (Boston, Chicago, Los Angeles) were chosen from Standard Metropolitan Statistical Areas with mature forms of each system of care. Within each system of care a representative sample of physicians (general internists, family physicians, cardiologists, endocrinologists, diabetologists, psychiatrists), psychologists, and other mental health providers were selected. All eligible physicians associated with the HMOs and LMSGs were asked to participate in the study (85% were enrolled; $N = 226$). In the solo fee-for-service sector, clinicians were initially selected by stratified random sampling from lists provided by national professional associations ($N = 2219$). Of these, 69% were contacted. Telephone interviews identified 513 eligible physicians (e.g. were between the ages of 31 and 55 years; were board eligible/certified or licenced for independent practice: and had direct patient care as their primary professional activity) who agreed to a final selection interview. Of these, 298 (58%) participated in the main study.

Among participating providers, a representative cross-section of their patients was screened during an average 9-day period. The sampling frame was the log of all patients scheduled to visit the provider during each day of screening. Excluded were patients who were under age 18, did not speak English, or were physically impaired in a way that would prohibit completing forms (e.g. blind). Patients screened ($N = 21,481$) who appeared to have one or more of four chronic diseases (hypertension, diabetes, coronary heart disease, and depression) constituted the sampling frame for the longitudinal patient panel ($N = 8040$). Hypertensives were eligible based on systolic and diastolic blood pressure readings reported by physicians; cornary heart disease patients consisted of those who had suffered a myocardial infarction within 12 months before screening and/or had congestive heart failure; diabetics were selected on the basis of physician reports of current diabetes, age of onset, and complications; depressed patients were sampled in a two-stage screening procedure [31]. A telephone interview was then used to collect additional information, and ask eligible patients to enroll in the longitudinal panel. The final enrolled sample included those patients who agreed to enroll in the study and completed the initial patient assessment questionnaire, a physical health examination and a calendar diary ($N = 2349$). These requirements were occasionally relaxed to maintain adequate sample size in each tracer condition. Patients who enrolled in the MOS were younger, better educated, had a higher income, and were more likely to be married or employed than were patients who refused enrollment.

The information included in this paper is based on a sample of 2987 patients who had completed the enrollment self-report questionnaire at the time these analyses were conducted. This sample is larger than the final enrolled sample because it includes data from patients who completed the patient assessment questionnaire but did not satisfy other enrollment requirements (e.g. completion of the health exam). For purposes of scaling analyses, we wanted as much data as possible. For our sample, ages ranged from 18–98 (mean age was 55). Thirty-nine percent were male, 20% were nonwhite, 68% were married, and 46% had completed high school (average of 13.3 years of education).

Social support items

At the time our survey was developed (during 1985), we conducted a review of available support measures, focusing primarily on functional aspects of support [10, 12–16]. We decided to focus on the measurement of the perceived availability of functional support (if needed) as recommended by Cohen and Syme [10], Cohen and Wills [20], and House and Kahn [21] because of our belief that a person's perceptions about available support are most important. The fact that a person does not receive support during a given time period does not mean that the person is unsupported. Received support is confounded with need and may not accurately reflect the amount of support that is available to a person.

We generated a pool of 50 possible items based on support items and dimensions identified in the literature review. The selection of the pool of items was guided by a strong *a priori* conceptual framework regarding the important dimensions of functional support, dimensions that are common in most recent models of support [11–16, 21]. We restricted our items to perceptions of the availability of different functional aspects of support (e.g. the degree to which interpersonal relationships serve particular functions) rather than more objective structural measures of support due to limited measurement resources. We included measurement of multiple support functions so that we would be able to evaluate how different types of support relate to health outomes. The items were designed to be as comprehensive as possible in terms of recent thinking about the various dimensions of social support, yet short enough to reduce respondent burden. In addition, they were designed to be as distinct as possible from related measures of loneliness, mental health, family functioning and social activity limitations.

We reworded items and response categories to conform to our emphasis on measuring availability

of types of support. As a test of the items' face validity, six behavioral scientists were asked to designate the appropriate social support category for each of the items. This step allowed us to delete items that seemed to be difficult to categorize. A pilot study was then conducted in which the final set of 37 functional support items (along with validity variables) were administered to patients visiting a rural health clinic in Southern Illinois. Based on pilot study results, we eliminated items that were not internally consistent with their hypothesized support dimension and that did not discriminate social support from other dimensions of health and health-related behavior.

Our final social support battery, then, contained 19 functional support items hypothesized to measure five dimensions of social support: (1) emotional support (the expression of positive affect, empathetic understanding, and the encouragement of expressions of feelings), (2) informational support (the offering of advice, information, guidance or feedback), (3) tangible support (the provision of material aid or behavioral assistance), (4) positive social interaction (the availability of other persons to do fun things with you), and (5) affectionate support (involving expressions of love and affection). Affectionate support has not been emphasized in the literature as a distinct type of support, but we felt that this type of support would be very beneficial to health outcomes of the chronically ill. To decrease respondent burden, we measured the various types of support without regard to the source (e.g. whether the support came from family, friends, community or others). For each item, patients were asked to indicate how often each kind of support was available to them if they needed it. Response choices were: none of the time, a little of the time, some of the time, most of the time, and all of the time. Specific item content is presented in the Appendix.

Because little is known about how structural measures are related to support functions [29], we included two single-item structural indicators of social support (e.g. the number of close friends and relatives and marital status) in our questionnaires. We did not intend, however, to develop a measure of structural support, primarily because of respondent burden constraints.

The social support items were included in self-administered questionnaires completed by the patient sample at enrollment in the study and one year later. Data from the first administration of the questionnaire are reported here.

Health status (validity) measures

We included a number of health and well-being measures in our analyses to test the discriminant validity of the social support items and to conduct preliminary analyses of the construct validity of the social support measures. Table 1 presents the definition and internal-consistency reliability of these validity measures. Physical health is operationalized in terms of four indicators: (1) physical functioning, which assesses the capacity to perform a variety of physical activities, (2) role limitations, measured in terms of the degree to which people are unable to perform usual daily activities because of physical health problems, and (3) and (4) pain defined in terms of the effects and intensity of pain.

Mental health is defined by a five-item affective measure of depression, positive affect, anxiety, and psychological well-being and a 3-item measure of role limitations due to the effects of emotional problems. Other health indicators, hypothesized to define physical and mental health about equally are: (1) current health, a generic rating of health in general, (2) social activity limitations, including limitations in visiting family, friends, neighbors and social groups due to physical health or emotional problems, (3) energy/fatigue which assesses positive and negative feeling states ranging from feeling full of pep to feeling worn out, and (4) physical symptoms, a count of the frequency of experiencing different physical and psychophysiologic symptoms. Finally, four variables (e.g. loneliness, family functioning, family happiness,

Table 1. Definitions and reliability of health concepts

Measure	No. of items	Definition	Reliability[a]
Physical functioning	10	Extent to which health interferes with a variety of activities (sports, walking)	0.92
Role limitations/physical	4	Extent to which physical health problems interfere with usual daily activities	0.86
Effects of pain	6	Behavioral and mood consequences of pain	0.91
Pain severity	5	Intensity of bodily pain in past 4 weeks	0.86
Mental health	5	General mood or affect, including depression, anxiety and psychologic well-being during past month	0.90
Role limitations/emotional	3	Extent to which emotional problems interfere with usual daily activities	0.83
Current health	4	Overall ratings of current health	0.87
Social activity	4	Extent to which health interferes with normal social activities	0.77
Energy/fatigue	5	General feelings of energy and lack of fatigue	0.88
Physical symptoms	8	General physical health symptoms that have physical or psychologic components	0.74
Loneliness	3	Feeling of belonging, of feeling loved and wanted	0.87
Family functioning	3	Satisfaction with family togetherness, support and communication	0.93
Family happiness	1	Overall satisfaction with family life	—
Marital functioning	6	Ratings of relationship with spouse in terms of togetherness, conflict and support	0.83

[a]Cronbach's [48] coefficient Alpha.

and marital functioning) hypothesized to be conceptually related to social support were included in the analyses in order to assure the discriminant validity of the support measures.

The MOS health and validity measures are based on the collective work of many investigators in the field of health assessment. The measures also build on our own experience in developing similar measures for the RAND Health Insurance Experiment (HIE) [9, 32–37]. However, the MOS measures are more comprehensive than those administered in the HIE, and many improvements in specific measures were achieved. For example, the MOS physical functioning measure obtains information on the degree of limitation for a broader set of functions [38]. The MOS role functioning measures define many levels of role limitations and distinguish between role limitations attributed to physical as opposed to mental health problems [39].

As seen in Table 1 the reliability of our validity measures is high. The distinctness of the physical and mental health constructs has been supported [40], and preliminary evidence demonstrating the ability of the health measures to discriminate among clinically defined patients has been shown [41–43]. Extensive information about the development and validation of all of these measures is provided in Stewart and Ware [44].

Analysis plan

We hypothesized groups of items that could be combined to score five different functional support measures. The hypothesized measures were analyzed using multitrait scaling techniques, a straightforward methodology for scale analysis [45]. Multitrait scaling allows a test of the convergent validity of the items in a hypothesized scale. It also allows a test of the discriminant validity of items, in relation to other *a priori* scales that one expects to be independent. When theoretical progress has moved beyond the exploratory state of development and one has a fairly good hypothesis about the underlying structure of a concept, confirmatory analysis (as in the multitrait scaling confirmatory approach) is more informative than exploratory analysis, i.e. factor analysis.

Because many researchers are unfamiliar with this multitrait scaling approach, we replicated our findings using confirmatory factor analysis. We estimated a confirmatory factor model for the 19 indicators of the latent social support subscales. The fit between the model and data was evaluated using EQS [46]. Rho and delta were used to provide measures of practical fit because they represent the proportion of statistical information in the data that is accounted for by a model [47]. The discriminant validity of the social support subscales was examined by inspecting the correlations between factors. Large correlations indicate a lack of discrimination between traits.

Factor analysis was used to test the feasibility of constructing an overall social support index.

Internal-consistency reliability of scale scores was estimated using Cronbach's Alpha coefficient [48]. One year stability coefficients were estimated from Pearson Product Moment correlations between the support measures at enrollment and the same measures administered one year later.

We tested whether the single-item measures of structural support were distinct from the functional support concepts by evaluating the strength of their correlation.

Several types of validity (i.e. the extent to which the social support scales measure what they are intended to measure) were assessed. In addition to the discriminant validity of items described above, associations among the social support scales and a number of the measures defined in Table 1 were computed to test selected construct validity hypotheses. This method involves evaluating the strength of the relationships to see if they are consistent with plausible hypotheses. We expected the relationship between support and closely related concepts (e.g. loneliness) to be strongest, followed by that between support and measures that contain aspects of both physical and mental health (e.g. current health perceptions). Lowest correlations would be expected between support and measures of physical health (e.g. physical and role functioning).

Finally factorial validity was assessed by performing a higher order factor analysis containing the social support measures and the constructs of physical and mental health, each defined in terms of one or more indicators. This method determines the nature and number of dimensions that account for correlations among a given set of measures. Three important factors were hypothesized.

RESULTS

Item variability

Responses to the 19 functional support items were skewed toward the positive end of the distribution (i.e. more frequent availability of support when needed). For the two structural support items, 68% of respondents had a spouse or partner; only 2% said that they had no close friends or relatives. The variability of the social support items was adequate for purposes of scaling analyses. Item means and standard deviations are shown in Table 2.

Multitrait and factor analyses

We began by evaluating the following five functional support subscales: emotional support ($k = 4$), informational support ($k = 4$), affection ($k = 3$), tangible support ($k = 4$), and positive interaction ($k = 4$). Evaluation of the multitrait correlation matrix showed considerable overlap between the four emotional support items and the four informational support items. We thus combined the items into one emotional/informational support scale.

All but one of the positive interaction items discriminated from the emotional/informational support items. The one positive interaction item (someone to do things with to help you get your mind off things) that did not discriminate well was deleted from further analysis.

The multitrait correlation matrix for the social support items grouped according to the four subscales is presented in Table 2. Included in the matrix are the items hypothesized to measure functional support, one structural measure of support (the number of close friends and relatives), and items used to define a number of validity variables

Table 2. Pearson item-scale correlations corrected for overlap for coefficients followed by * (standard error = 0.02)

Support item	Mean	SD	Scales TAN	AFF	POS	EMI	CLO	SOC	MHI	LON	FAM	MAR	HAP	CUR
Availability of someone to:														
Help if confined to bed	3.7	1.2	0.81*	0.57	0.57	0.59	0.18	0.21	0.30	−0.44	0.35	0.32	0.36	0.13
Take to doctor	4.1	1.1	0.72*	0.59	0.59	0.61	0.15	0.24	0.34	−0.46	0.37	0.33	0.36	0.15
Prepare meals	3.8	1.3	0.86*	0.67	0.65	0.63	0.17	0.24	0.35	−0.49	0.40	0.38	0.42	0.17
Help with daily chores	3.7	1.3	0.87*	0.67	0.68	0.65	0.17	0.23	0.34	−0.48	0.40	0.38	0.41	0.15
Show love and affection	4.2	1.0	0.67	0.83*	0.75	0.72	0.16	0.28	0.42	−0.67	0.54	0.54	0.53	0.19
Hug you	3.8	1.3	0.62	0.80*	0.75	0.67	0.17	0.24	0.35	−0.60	0.50	0.49	0.48	0.18
Love you	4.0	1.2	0.64	0.86*	0.78	0.73	0.17	0.27	0.42	−0.68	0.55	0.54	0.55	0.17
Have good time with	3.9	1.0	0.65	0.77	0.87*	0.77	0.19	0.31	0.43	−0.60	0.48	0.49	0.49	0.22
Get together for relaxation	3.8	1.1	0.65	0.78	0.87*	0.78	0.17	0.32	0.44	−0.61	0.50	0.49	0.49	0.22
Do something enjoyable with	3.9	1.1	0.67	0.78	0.88*	0.78	0.21	0.32	0.45	−0.61	0.50	0.49	0.51	0.24
Listen to you	4.0	1.0	0.64	0.66	0.70	0.82*	0.21	0.27	0.38	−0.53	0.43	0.42	0.41	0.19
Confide in	3.9	1.1	0.61	0.69	0.75	0.89*	0.21	0.26	0.38	−0.54	0.44	0.44	0.42	0.19
Share worries with	3.7	1.3	0.64	0.72	0.76	0.87*	0.21	0.24	0.39	−0.56	0.46	0.48	0.44	0.17
Understand your problems	3.8	1.2	0.60	0.72	0.76	0.86*	0.21	0.26	0.42	−0.58	0.49	0.49	0.45	0.18
Give you good advice	3.8	1.1	0.59	0.59	0.65	0.83*	0.22	0.24	0.37	−0.50	0.41	0.38	0.38	0.16
Give you information	3.8	1.0	0.62	0.65	0.74	0.83*	0.20	0.25	0.39	−0.52	0.43	0.42	0.40	0.18
Give advice you really want	3.7	1.2	0.61	0.69	0.74	0.84*	0.21	0.23	0.36	−0.54	0.45	0.42	0.42	0.15
Turn to for suggestions	3.8	1.2	0.62	0.69	0.74	0.90*	0.21	0.24	0.36	−0.53	0.44	0.45	0.41	0.17

Note: TAN = tangible support; AFF = affectionate support; POS = positive social interaction; EMI = emotional/informational support; CLO = number of close friends/relatives; SOC = social activity limitations; MHI = mental health index; LON = loneliness or emotional ties; FAM = family satisfaction; MAR = marital satisfaction; HAP = happiness with family life; CUR = current health perceptions.

hypothesized to be closely related to social support. We wanted to assure that the support measures were empirically distinct from these concepts. Row entries in the matrix represent correlations between each item and the sum of the items in each scale grouping. Asterisks indicate the hypothesized scale placement of each item and also indicate item-scale correlations that were corrected for overlap (i.e. each item is correlated with the sum of the other items in the scale).

All the items correlated highly (at least 0.72 or greater) with their hypothesized scales, exceeding our convergent validity criterion (i.e. correlations should be greater than $r = 0.30$). Item-scale correlations ranged from 0.72 to 0.87 for the tangible support scale, 0.80–0.86 for the affection scale, 0.82–0.90 for the emotional/informational scale, and 0.87–0.88 for the positive interaction scale.

All items in the four functional social support subscales met our criteria of discriminant validity, that is, correlated higher by two standard errors with their own scale than with any other social support scale. They also discriminated well from the validity measures, supporting their distinction from measures of loneliness or feelings of belonging, mental health, current health perceptions and other aspects of family and social functioning.

Confirmatory factor analysis produced similar results. The correlations between emotional and informational support were high (0.99). A model was estimated fixing the correlation between these two support subscales at 1.00. This model was statistically rejectable (due to the large sample size) but fit the data fairly well according to practical fit criteria (delta = 0.96, rho = 0.95). The standardized parameter estimates were statistically significant and large in magnitude. Standardized factor loadings ranged from 0.76 to 0.93 for the tangible support factor, 0.86–0.92 for the affection factor, 0.82–0.92 for the emotional/informational factor, and 0.91–0.93 for the positive interaction factor. Other models were estimated fixing the correlations between other pairs of support subscales. These models fit the data significantly less well, suggesting that the 4 social support subscales are distinguishable.

Results of a principal components factor analysis of the 19 support items supported the construction of an overall index. The first unrotated factor showed high loadings for each of the items, ranging from 0.67 to 0.88. Thus, in addition to four subscales, an overall support index which reflects a common higher order support factor can also be constructed.

A score for each social support scale was computed by averging across items to calculate the scale score. Scales were then transformed so that the lowest possible score was 0 and the highest possible score was 100, indicating more frequent availability of different types of support, if needed.

Reliability

Internal-consistency reliability and one-year stability coefficients for four social support subscales and the overall support index are presented in Table 3. As can be seen, internal-consistency reliability estimates are high for all support measures, exceeding a 0.50 standard [49].

Descriptive statistics

Table 3 presents descriptive statistics for the social support measures. As seen there, the full range of scores was observed for all measures. The mean level of support of all types (results not shown here) was significantly higher in males than females, the married than the unmarried; and older patients (ages 45 or greater) rather than younger patients (less than 45).

Structural measures of support

The single-item structural support measure of number of close friends and relatives appears to be distinct from the functional support items. The single-item measure correlated low to moderately with the measures of tangible support (0.19), affection (0.18), emotional/information (0.24), positive interaction (0.20), and the overall support index (0.23).

Table 3. Descriptive statistics for social support measures

Measure	k	Mean	Standard Deviation	Observed Range	Alpha	Stab
Emotional/info support (+)	8	69.6	25.5	0–100	0.96	0.72
Tangible support (+)	4	69.8	28.5	0–100	0.92	0.74
Positive interaction (+)	3	69.8	26.0	0–100	0.94	0.72
Affection (+)	3	73.7	28.3	0–100	0.91	0.76
Overall support index (+)	19	70.1	24.2	0–100	0.97	0.78

k = Number of items; Alpha = Cronbach's [48] internal-consistency reliability coefficient; Stab = one-year stability coefficient (note: because two emotional/informational support items were not administered on the year-one questionnaire, the stability coefficients are based on 6-item emotional/informational support and 17-item overall support scales).
+ A high score indicates more support.

The indicator of marital status (i.e. spouse or partner) was not related to the number of close friends/relatives item ($r = 0.01$). It was moderately related to the measures of functional support, such that those respondents who had a spouse or partner had more functional support available. Correlations between marital status and the functional support measures ranged from 0.20 to 0.33, suggesting that marital status is distinct from the functional support measures. The correlations among the functional support measures themselves were much higher (r's were as follows: tangible with affection = 0.70, tangible with emotional/information = 0.69, tangible with positive interaction = 0.70, affection with emotional/information = 0.76, affection with positive interaction = 0.80, emotional/information with positive interaction = 0.82).

Validity

Table 4 presents Product Moment Correlations between the social support measures and the validity variables defined in Table 1. The social support measures correlated most highly with the measure of loneliness or emotional ties, followed by measures of family and marital functioning and mental health, all concepts hypothesized to be closely related to social support. Lowest correlations were with the more pure measures of physical health status, including physical functioning and pain intensity. Health measures that had components of both physical and mental health (e.g. current health, role limitations due to emotional reasons, energy and physical symptoms) correlated slightly higher with social support. All correlations were significant at $P < 0.01$.

Table 5 presents a higher order factor anlaysis of physical and mental health and social support measures. Three factors were associated with eigenvalues equal to or greater than unity. The measures have been organized (by rows) in terms of the factors they correlated highest with. The first rotated factor correlated highly (>0.83) with the social support measures. The only other measure that correlated with this factor was loneliness, which also had high loadings on the mental health factor. The second factor correlated very highly with the physical health measures, while the third factor correlated highly with the mental health-related measures. The structural support measure of number of close friends and relatives did not correlate highly with any of the three factors. The measures of energy and social activity correlated with both the physical and mental health factors.

SUMMARY AND DISCUSSION

We developed a relatively short, 19-item survey of functional social support that represents multiple dimensions of support: emotional/informational, tangible, affectionate, and positive social interaction. The choice of measures was guided by current theory as to the most important dimensions of support [22–24]. Consistent with recommendations, we focused the MOS items on the most essential aspects of social support—the perceived availability, if needed, of various components of functional support [10, 20, 21]. The MOS survey appears to be easy to administer to chronically ill patients. Items were designed specifically to be short, simple

Table 4. Pearson product-moment correlations of health measures with social support measures

Validity variables[a]	Support measure: Tangible	Affection	Positive interaction	Emotional/ information	Overall
Loneliness (−)	−0.53	−0.69	−0.63	−0.60	−0.67
Family functioning (+)	0.38	0.56	0.51	0.49	0.53
Marital functioning (+)	0.44	0.57	0.52	0.50	0.56
Mental health (+)	0.36	0.41	0.45	0.40	0.45
Current health (+)	0.16	0.19	0.25	0.20	0.22
Physical functioning (+)	0.08	0.07	0.15	0.10	0.11
Role limitations (physical) (−)	−0.18	−0.14	−0.22	−0.19	−0.20
Role limitations (emotional) (−)	−0.25	−0.26	−0.30	−0.25	−0.29
Energy/fatigue (+)	0.22	0.24	0.30	0.26	0.28
Effects of pain (−)	−0.17	−0.15	−0.23	−0.18	−0.20
Pain severity (−)	−0.16	−0.14	−0.21	−0.18	−0.19
Social activity (+)	0.24	0.28	0.33	0.27	0.30
Physical symptoms (−)	−0.18	−0.18	−0.25	−0.22	−0.23

[a]Direction of scoring is indicated in parentheses (e.g. a negative sign indicates poorer health or functioning, a positive sign indicates better health or functioning).
Note: All correlations are significant at $P < 0.01$.

Table 5. Higher order factor analysis of physical and mental health and social support measures

Measure[a]	Social support factor	Physical factor	Mental factor	Ho[b]
Tangible support (+)	0.83	−0.10	0.09	S
Affectionate support (+)	0.89	−0.06	0.20	S
Positive interaction support (+)	0.88	−0.16	0.20	S
Emotional/information support (+)	0.88	−0.12	0.15	S
Number friends/relatives (+)	0.22	0.06	0.28	S
Physical functioning (+)	0.03	−0.80	−0.11	P
Role limitations/physical (−)	−0.08	0.80	−0.13	P
Energy/fatigue (+)	0.13	−0.68	0.43	PM
Effects of pain (−)	−0.08	0.85	−0.16	P
Pain severity (−)	−0.08	0.87	−0.11	P
Physical symptoms (−)	−0.13	0.75	−0.19	PM
Current health (+)	0.09	−0.73	0.29	PM
Mental health (+)	0.32	−0.28	0.80	M
Role limitations/emotional (−)	−0.12	0.34	−0.73	M
Loneliness (−)	−0.64	0.11	−0.57	M
Social activity (+)	0.14	−0.57	0.58	PM

Note: Entries are rotated factor loadings based on Varimax Rotation.

[a]Direction of scoring is indicated in parentheses (e.g. a negative sign indicates poorer health or functioning, a positive sign indicates better health or functioning).

[b]Hypothesized *a priori* to measure social support (S), physical health (P), mental health (M), or a combination of physical and mental health (PM).

and easy to understand, restricted to one idea in each stem. Response choices were chosen to maximize the sensitivity of our measures, based on previous study findings which suggest that five to seven response categories provide a lower bound necessary for optimal assessment of a measurement domain [50–52].

Our results showed high convergent and discriminant validity of items, supporting the dimensionality of our measures. Although the support subscales are highly correlated (r's range from 0.69 to 0.82), as would be expected if they represent dimensions of a common higher order factor (i.e. social support), results from the multitrait and confirmatory factor analyses support the scoring of subscales. Further support for this conclusion is the finding that the observed correlations between subscales is consistently less than the square root of the product of their reliabilities (theoretically the maximum correlation between two measures). When this occurs, it suggests that there is unique variance in each social support subscale. For those interested in using only one overall support measure, results also supported the construction of an overall index that combines the 19 items.

The empirical distinction of the support measures from measures of physical and mental health status was confirmed, as was the distinction between support and closely related concepts such as loneliness and family functioning. The reliability of the measures was high and the measures were fairly stable over a one-year interval.

Our multidimensional model of social support is similar to a number of models reviewed by Cutrona and Russell [53]. Although named differently, many of the components of social support converge on a common set of dimensions that are represented in our model; emotional support (also referred to as attachment or affect), informational support (i.e. guidance or appraisal support), tangible support (i.e. material support, aid, reliable alliance), and positive social interaction (similar to the concept of social integration, belonging or social companionship). The only concept that is not represented in our model is that of self-esteem support, defined by others in terms of a positive comparison between one's self and others [11]. This type of support may be more relevant for populations other than the chronically ill (e.g. college students).

Empirical evidence for the multidimensionality of social support, however, has been conflicting. Some studies have reported that their social support components are too highly correlated to be distinguished empirically [16, 21]. Others, like this study, have reported some evidence of independence between measures [23, 54–56]. Conflicting results may be due to the fact that published support measures contain different sets and numbers of items that vary not only in content but in the way questions are asked, the response codes used, and the emphasis on received or available support provided by different sources. In most cases, social support components, even though they discriminate from one another, are still highly intercorrelated. This may be expected since people who provide one type of support are often likely to provide other types of support. However, in spite of substantial correlations among dimensions, different types of support may be more beneficial for certain health outcomes. Recent findings that specific social support components do not necessarily exhibit the same patterns of correlations with other variables and that different types of support are helpful for different problems supports the importance of attempts to document the dimensional structure of social support measures [53, 56].

Further improvements of our social support measures may be warranted. Further empirical study is needed to determine whether emotional and informational support can be differentiated. Findings from our research did not support their distinctness from one another, in contrast to the findings of others [54, 55]. Inspection of our items after the fact suggest that both the emotional and informational support items are indicative of supportive communication between the respondent and someone that he or she feels very close to. Further study should determine whether a measure of emotional support can be developed that more closely matches the definition of

'caring, love and empathy.' The degree to which it can be distinguished from 'affectionate' support, which we defined as behavioral manifestations of love (e.g. hugging someone), would also need to be determined. It may be that what we labeled 'affection' is really emotional support. We also would suggest developing a more comprehensive measure of the structural dimension of social support to use in addition to our measures of functional support. Our findings showed that the two measures of structural support (the number of close friends and relatives and marital status) appear to be very distinct from the functional dimensions of support, a confirmation of previous findings [29]. Future analyses using a more comprehensive measure of the structural dimension of social support would further clarify the extent to which there are differences in results when structural as opposed to functional measures of social support are assessed.

In conclusion, due to the evidence of some independence among the support subscales and because use of an overall index to test analytic hypotheses would make it difficult to determine which functions of support lead to different outcomes, we recommend scoring and using the support subscales separately. Ultimately, the issue of whether or not to score and use the subscales separately will be resolved in tests of which models best predict health outcomes, controlling for sociodemographic variables, disease status and disease severity, and other theoretical variables of interest.

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APPENDIX

MOS Social Support Survey

Next are some questions about the support that is available to you.

1. About how many close friends and close relatives do you have (people you feel at ease with and can talk to about what is on your mind)?

Write in number of close friends and close relatives: ☐☐

People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?

(Circle One Number On Each Line)

	None of the Time	A Little of the Time	Some of the Time	Most of the Time	All of the Time
2. Someone to help you if you were confined to bed.....	1	2	3	4	5
3. Someone you can count on to listen to you when you need to talk	1	2	3	4	5

4. Someone to give you good advice about a crisis.....	1	2	3	4	5
5. Someone to take you to the doctor if you needed it	1	2	3	4	5
6. Someone who shows you love and affection	1	2	3	4	5
7. Someone to have a good time with	1	2	3	4	5
8. Someone to give you information to help you understand a situation.....	1	2	3	4	5
9. Someone to confide in or talk to about yourself or your problems	1	2	3	4	5
10. Someone who hugs you	1	2	3	4	5
11. Someone to get together with for relaxation	1	2	3	4	5
12. Someone to prepare your meals if you were unable to do it yourself.....	1	2	3	4	5
13. Someone whose advice you really want.....	1	2	3	4	5
14. Someone to do things with to help you get your mind off things	1	2	3	4	5
15. Someone to help with daily chores if you were sick	1	2	3	4	5
16. Someone to share your most private worries and fears with.....	1	2	3	4	5
17. Someone to turn to for suggestions about how to deal with a personal problem	1	2	3	4	5
18. Someone to do something enjoyable with	1	2	3	4	5
19. Someone who understands your problems	1	2	3	4	5
20. Someone to love and make you feel wanted	1	2	3	4	5