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ABSTRACT

In previous research, two major sets of variables have been identified as correlates of emotional well-being among the elderly: measures of physical health and of social support. To suggest variables predictive of in-hospital discharge planning, and of emotional well-being after a severe incident of ill health, the Posthospital Support Study examined emotional well-being among elderly patients (N=132) who had been hospitalized for arteriosclerotic heart disease or for an operation following hip fracture or for replacement of a hip joint. These conditions were chosen because patients required some help or services from others (both formal and informal) after hospital discharge. Patients were interviewed just prior to hospital discharge and again within three months, on the average, after discharge to the community. Emotional well-being was measured by the Bradburn Affect Balance Score and anxiety and depression were measured by the Profile of Mood States. Additional data were obtained from hospital medical records, informal interviews with hospital staff, and caregiver (N=80) interviews. The results showed that only the indicators of health and severity of problems directly predicted well-being. Ill health was associated with and predictive of a poorer mood state. Severity of health problems predicted negative mood in the form of high anxiety. Some measures of poor health predicted lessened emotional well-being. The provision of services, formal or informal, did not compensate for or relieve poorer physical health or more severe health problems; rather, these services appeared to be indicators of need. A six-page list of references is included. (NRB)

PREDICTORS OF EMOTIONAL WELL-BEING IN ELDERLY AFTER HOSPITALIZATION[1]

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PREDICTORS OF EMOTIONAL WELL-BEING AFTER HOSPITALIZATION

The association of measures of emotional wellbeing with those of physical health and social support has been the focus of many studies and literature reviews (e.g., the studies cited by Diener, 1984; Harris, 1975; Larson, 1978; Lawton, 1974; Linn, 1976; Lowenthal, 1964; Lowenthal, Burkman and Associates, 1967; Simon, 1974). While many studies have considered additional dimensions, two major sets of variables have generally been identified as correlates of emotional wellbeing: measures of health and those of social support.

Physical Health as a Predictor

Typical of studies concentrating on physical health as a predictor are those of Hankin and Locke (1982) and of Johnson and Ware (1976). Using medical records of a group of prepaid practice enrollees as sources of objective measures of physical illness, Hankin and Locke found these to be associated with depression, as measured by the C.E.S.-D., over a one-year time period. Using self-reported measures of health (and controlling for income), Johnson and Ware found strong associations between mental and physical health. The concept of physical health can also be extended to include level of function (or degree of functional impairment), as measured in various ways.

Social Support as a Predictor

The existence of social support structures, networks, or the evidence of social interaction are hypothesized to be predictors of emotional wellbeing

(Billings and Moos, 1982; Blazer, 1982; Kivett and Learner, 1982; Mugford and Lally, 1979). Many studies, however, have found frequency of interaction alone to be nonpredictive (c.f., Lee, 1979, 1980). Other studies have attempted to measure the quality of social interaction, such as emotional bondedness (c.f., Snow and Crapo, 1982). A number of studies (e.g., Beckman and Hauser, 1982; Brugha, et al, 1982; Conner, et al, 1979; Ward, 1979) have attempted to combine measures of frequency with those of quality of interaction, or of expressive social support, using emotional wellbeing as the outcome variable. A burgeoning literature on instrumental social support (contacts that have help or service performance as their focus of interaction) has usually employed dependent variables measuring health, or functional maintenance, or the keeping of elderly recipients out of institutions. Much of the earlier literature in this area has not differentiated among presence, frequency, or type of social support.

Multiple Predictors

More typically, studies of the predictors of emotional wellbeing have used a multivariate approach, although some of the classic earlier studies and literature reviews were done before the development of multivariate techniques that made it possible to consider the independent effects of predictor variables. For example, in separate analyses, Himmelfarb and Murrell (1984) and Murrell, Himmelfarb and Wright (1983) found symptoms of anxiety and depression to be associated with lower socio-economic status and poorer physical health, as well as with such other variables as urban residence and age. Harel, Sollod and Bognar (1982), using multiple regression techniques, found health variables, social integration variables, demographic and socioeconomic status variables (in that order) to account for almost half the variance in self-rated mental and emotional health. Larson, in his review of 30 years of research on the well-being of older Americans, found self-reported well-being to be most consistently related to health, followed by socio-economic status and degree of social interaction and to a lesser extent, marital status and aspects of living situations. Luke et al (1981) found psychological distress to be associated with health problems and social isolation. Palmore et al (1979) found better health and social resources (a combination of SES and social network characteristics) to be associated with social-psychological satisfaction. In previous analyses of the data set presented here, Lurie et al (1984) and Robinson and Barbaccia (1983) found that discharge planning in hospital, service provision after hospital, and sources of services received after hospital discharge, during the followup period, varied significantly across patients; and was at least as closely associated with hospital need to discharge patients in a timely manner and potential third party reimbursement for services as with assessed patient need.

RESEARCH MODEL

Given these considerations, a theoretical model of emotional well-being after hospitalization has been developed, involving the following components:

a) health and severity of problems;

b) support and receipt of services;

c) functional status; and

d) characteristics of informal caregivers.

In this model, measures of physical health and service are hypothesized to predict emotional well-being. It is hypothesized that better health, receipt of more support and services to compensate for impairment, and better functional status will be positively associated with better emotional well-being. Likewise, greater caregiver availability and involvement, lower caregiver strain, and better caregiver emotional well-being will be associated with patient well-being.

This study differs from other studies of emotional well-being among the elderly in that it examines this variable in the context of recovery from a discrete health episode which necessitated receipt of help from others in the initial stages. Accordingly, variables unique to this study included measures of both the number of services from formal providers (reimbursed for services rendered); from informal providers (family, friends, neighbors and other unpaid help); and the number of helps and services available from each source. Caregivers were asked about their commitment to providing such help in the future, the extent to which giving help strained them (Robinson, 1983), and for their own Affect Balance scores (Bradburn, 1969). Additionally, a measure was constructed of the respondent's total face-to-face contact once a week or more with the informal support system of family, friends and neighbors in the community two months after discharge. This level of contact was used because it appeared to be the minimum required to provide help or instrumental support. However, the content of this contact for each informal support system member was not ascertained.

The present study is exploratory in nature, with a relatively small number of respondents, drawn from three hospitals that represented different organizational types. The purposes of the study were to suggest variables predictive of in-hospital discharge planning and of emotional wellbeing after an incident of illness or ill health sufficiently severe to require acute hospitalization.

Emotional Wellbeing

Three measures of emotional wellbeing are employed as outcome variables: (1) Bradburn Affect Balance Score (Bradburn, 1969); (2) anxiety; and (3) depression -- the latter two as assessed by the Profile of Mood States (P.O.M.S.) (McNair, et al, 1971). The Bradburn Affect Balance score may be seen as measuring "mood ... a time-limited state of happiness or unhappiness" (M. Powell Lawton, 1977); in this case, both positive and negative moods over the past week. The P.O.M.S. uses an adjective checklist to represent more generalized mood states without a specified time limit; many of these, however, can also be seen as "intrapsychic symptoms such as anxiety, depression ..." (Powell Lawton, 1977). Mood or affect were seen as more appropriate measures in response to the illness episode and subsequent recuperation than were measures of "deeper pathology" or more long-lived psychological states. Separate analyses were run for each of these three outcome measures.

Measures of Health, Social Support and Function

Measures of health are: whether there were previous admissions to a hospital in the year prior to the target hospitalization; diagnosis at admission to hospital (for this sample, whether the patient was admitted for a hip or for a heart problem); and severity of illness before discharge from hospital (ie., at baseline). These factors are seen as prior to social support and functional status.

Measures of support encompassed both informal social support and receipt of formal services. Although such variables can also be seen as measures of response to need, or of severity of need, it was felt that the health measures already controlled for need. The support measures are: receipt of discharge planning in the hospital; number of people from informal support system seen once a week or more; number of types of formal services received in the period between discharge and followup interview; number of types of informal services received in the period between discharge and followup; and number of days of hospitalization between discharge and followup.

Functional status was measured at followup by a scale employing items, derived from the O.A.R.S. (Duke University, 1978), to measure the number of Instrumental Activities of Daily Living with which the respondent needed help. This is a measure of functional status at followup, and is considered an outcome of the illness, of the hospital care, and of the period between discharge and followup.

The model of health, social support, and function is hierarchical. In this model, health is antecedent to support, which is antecedent to function. The models of the subareas of health and of social support are also hierarchical. The variables are listed above in the assumed orders of priority (and see Table 1), except that severity and diagnosis are contemporaneous, as are formal and informal services (see order of entry of variables in Tables 3-7). The orders of priority represent the approximate temporal order in which events occurred. This ordering is, however, adapted to the concerns of the theoretical model. Thus, receipt of informal and receipt of formal services are considered contemporaneous without investigation of any actual differences in the chronology of receipt of such services, because both are seen as representing receipt of support in the followup period. Likewise, severity rating and diagnosis are seen as contemporaneous because they both reflect the state of health during hospitalization, without concern for the actual order in which the patient was diagnosed and then rated for severity.

The health, social support and function factors are seen as predicting and therefore correlating with one another, potentially raising the issue of multicollinearity among the independent variables. However, multicollinearity is addressed by the hierarchical nature of the model. Although one predictor (e.g., severity) should be associated with another (e.g., receipt of discharge planning), the common variance of the predictors is attributed to the prior variable (in this case, severity). Strong association of a prior measure such as severity with a subsequent variable such as discharge planning may create problems of estimation of the direct effect of the prior variable net the effect of the subsequent variable, but will not create problems of estimation of the total effect of the prior variable -- and it is with the latter that the analysis is concerned. Strong association of a subsequent variable with prior measures may create problems of estimation of the effect of the variable at the point of its entry into the model. However, this effect may also indicate (1) the effects of prior variables are mediated by the measure in question (e.g., discharge planning); and (2) the subsequent variable has little independent variability with which to explain outcomes. Both of these are germane to the present analysis.

Caregiver Variables

Previous analyses of this data set showed statistically significant correlations of caregiver well-being with ex-patient physical health and emotional well-being characteristics (c.f. Robinson, 1983). Therefore, caregiver variables were hypothesized to predict respondent emotional well-being. Where the primary caregiver is the patient's spouse, this is taken as generally indicating greater caregiver concern, involvement and availability. This is predicted to be positively related to respondent emotional wellbeing. The caregiver's involvement in taking care of the respondent, lower caregiver strain (Robinson, 1983) and the caregiver's Bradburn Affect Balance score were also hypothesized to be positively associated with respondent's emotional well-being. The caregiver variables are seen as hierarchically ordered, with order of priority as described (see Table 1). Likewise, the caregiver variables as a whole are seen as subsequent to patient health, social support, and functional status.

Control Variables

Five control variables were employed in the analysis for each outcome measure. These controls were of two types: (1) adjustments to the measurement of outcome, and (2) control for patient characteristics.

Outcomes are conceptualized as changes in emotional wellbeing over the period between hospitalization and followup. The measure of such change is defined as the deviations of the followup emotional wellbeing measure from what would be expected given emotional wellbeing in the hospital -- ie., regression adjustment of followup scores on the basis of baseline scores. Thus, in the analysis of each of the three measures of emotional wellbeing at followup, the equivalent baseline measure of emotional wellbeing is entered into the equations.

The study design had designated 60 days as the followup time point. In fact, however, time of followup interview varied between 39-194 days. Presumably, those interviewed later had recovered more from the target episode of illness so that their emotional well-being was less affected. There were, however, no statistically significant associations between other variables and time of followup, and no systematic biases associated with time of followup. Inspection of the interviews showed that reasons for date of followup, which were set by respondents in phone calls preceding the followup interviews, were diverse. They reflected greater mobility by respondents from their usual residence, but included both those who recovered quickly and were unavailable later, e.g., due to leaving town; and others who were unavailable earlier, e.g., either because they had recovered quickly and then left town, or had recovered slowly and moved into another residence to be taken care of during their earlier recuperative period. Nevertheless, since time between baseline and followup may have implications for emotional well-being not captured by either quantitative associations or qualitative inspection of the data, it is included in the equations. In effect, this adjusts the outcome score for differences in the length of the period between discharge and followup.

Age, sex and race are individual characteristics of patients that exist prior to episodes of hospitalization, that may affect likelihood of hospitalization and type of treatment, that may affect social support in the period between discharge and followup, and that may influence both emotional well-being and the consequences for well-being of the factors of theoretical interest. These are, of course, major stratifying or differentiating societal variables which may impact both directly and indirectly on emotional well-being through their associations with other independent variables (such as diagnosis). However, in this study age, sex and race were not of primary interest, and were not hypothesized to have directional associations with well-being. Thus, these variables are employed as controls in the analysis of each of the three outcome measures. Race is dichotomized as white/nonwhite, since there were too few non-whites to differentiate among them.

METHODOLOGY

Sampling

The Posthospital Support Study was a study of 170 patients aged 65 or over who were consecutively admitted to and then discharged from three San Francisco acute care hospitals during the course of one year. These patients had been hospitalized for arteriosclerotic heart disease or an operation following hip fracture or for replacement of a hip joint (hip arthroplasty). Both these conditions were chosen because they require a recuperative period after hospital, and because patients with hip conditions, and to a lesser extent patients with heart conditions, are not immediately capable of complete self-care and require some services or help from others for maintenance. Patients admitted from or discharged from nursing homes for maintenance care were excluded from the sample. Otherwise, patients who gave consent and whose physician also gave consent for interview, were included in the sample. The sample pool included all hip patients at all three hospitals, all heart patients at a University hospital, and every other heart patient at a community and health maintenance organization hospital. These patients were interviewed in hospital as close as possible to discharge; interviews were obtained with 132 (78%) approximately two months after discharge to the community. Patients in the three hospitals were essentially similar, except that the community hospital patients were older than others with a mean age close to 80 as compared to a mean and median age of 76 for the sample as a whole.

The three hospitals were selected because it was known that they differed in organizational structures, which it was thought would be reflected in the discharge planning process. There were, however, essentially no differences in discharge planning or types of services received after hospitalization. Discharge planning was partially determined by patient characteristics and partially by third-party reimbursement available for planned services at all three hospitals (Lurie, et. al., 1984; Robinson and Barbaccia, 1983).

At followup after hospital discharge, 100 patients named a main helper or caregiver from the informal support system. Another 18 named a caregiver from a formal agency, and another 14 insisted that they had no caregiver. In this group of respondents, there was a clear order of preference and substitution for those who named a main caregiver. Those with spouses of either sex, except for two men whose spouses were impaired physically, named spouses. Those with no spouses but daughters named a daughter. Those with no daughters but sons, with two exceptions who named their daughters-in-law, named sons. Those with no children named other relatives; including siblings, nephews and nieces, grandchildren, and the daughters-in-law. Finally, those with no relatives in the Bay Area named friends or neighbors (interchangeable categories to most respondents). Caregiver interviews were obtained for 30 patients.

Respondents being cared for by spouses were not significantly different from those being cared for by children in the number of services they received, but had the lowest number of formal services and the fewest other caregivers involved in their care (except for those who named no caregivers). The burden of caregiving, when there was a spouse, appeared to fall almost exclusively on that person; whereas children and other relatives appeared to function as mobilizers and managers as well (Lurie, et. al., 1984), obtaining services from other informal and formal providers.

Measurement

Measures are derived from five sources of data: (1) the hospital medical records of the respondent; (2) informal interviews with professional staff in hospital, and observation of patient-staff and intrastaff interaction; (3) the baseline interview, which occurred in-hospital; (4) the followup interview, which took place in the respondent's home; and (5) the interview with the caregiver, which took place at followup.

The dependent variables are measures of affect obtained through the followup interview. The same measures were obtained in the baseline interview for use as controls. These measures were also collected for the primary caregivers, to measure caregiver emotional wellbeing at followup, but only the Bradburn Scale scores are sufficiently complete to allow for the analysis of caregiver wellbeing. The Bradburn Affect Balance Scale (Bradburn, 1969) was used to measure affect balance. The Profile of Mood States (McNair, Lorr and Droppleman, 1971) was employed to measure anxiety and depression.

Data obtained from hospital medical records for each patient for the duration of the target admission, the year prior to admission, and the year subsequent to discharge were the source of the following measures: whether or not the respondent had been hospitalized in the year prior to the target admission; and the number of days spent in-hospital between discharge from the target admission and the followup interview. These variables are conservative estimates of actual hospitalization because only the records of the three target-admission hospitals were investigated. Additional data were derived from these hospital records on the in-hospital receipt of discharge planning, the system involved in the primary diagnosis (hip or heart), and the severity of impairment engendered by the primary-diagnosis problem.

Severity of impairment is assessed on a four-point scale, with four indicating greater impairment. Hip patients were evaluated using the Harris method (Harris, 1969), which is intended to be based primarily on patient self reports of experiences of pain and interference with daily activity. On this study, however, the Principal Investigator, a physician, used data from the medical records to rate each hip patient on a scale ranging from 0 to 91, with higher scores indicating better function. Scores were then assigned to the four-point scale in the method prescribed by Harris (1969): the top ten percent have "excellent" function (low severity of impairment); the function of the next ten percent is termed "good"; that of the next ten percent is termed "fair"; and the bottom seventy percent have "poor" function (high severity of impairment -- scored four on the scale). For the 52 of the 132 respondents in the final study sample who were hip patients, there is no variability on the hip scale -- only one patient was rated as having an impairment other than "poor." Heart patients were assessed directly on a four-point scale, using information from the medical records according to guidelines provided by the New York Heart Association (c.f., Krupp and Chatton, 1984: 177) -- this scale is also based upon patient self-reports of impairment of daily activity. For the analysis of severity, the hip and heart severity scales were assumed to be comparable. If this assumption is incorrect for average scores for hip and heart patients, estimates of the effect of diagnosis (hip or heart) will be biased; however, the lack of variability on the hip scale makes comparability of hip versus heart scale intervals moot.

Information on the age (in years), sex (female=1), and race (nonwhite=1) of the respondent was gathered in the baseline interview. At the followup interview, the respondent was also asked to identify the individual who had had primary responsibility for post-discharge care.

In the followup interview, the informal support system was assessed by asking the respondent to list all living brothers, sisters, and other relatives, as well as friends and neighbors, and how often they see these people. In the analysis, the informal-support contact variable is the number of people the respondent reported seeing at least once a week.

Receipt of services was assessed by asking the respondent at followup whether any assistance had been received at any time since discharge in each of the following areas: nursing, social work services, physical therapy, occupational therapy, other forms of instrumental therapy, psychological services, transportation, accompaniment on outings, in-home supervision (constant or periodic), fixing things around the home, shopping, doing laundry, household chores, meal preparation, management of business affairs, bathing or dressing, ambulation, toileting, and having someone visit to see if the respondent was alright. Respondents were asked about the sources of such assistance; and separate counts were kept of the number of types of services received from formal sources (recognized social agencies, building management, or individuals paid for services rendered) and from informal sources (family, relatives, friends, neighbors, or other individuals not paid for services rendered). Since some types of services were received from both formal and informal sources, summing the formal and informal scales would have overestimated the totals for types of services received.

The respondent's functional status, ability for self-maintenance at home, was measured at followup by an Instrumental Activities of Daily Living Scale (IADL), drawn from the OARS battery (Duke University, 1978). High scores on the IADL indicate that the respondent reports that more help is needed in the areas of transportation, shopping, doing laundry, household maintenance, meal preparation, and management of business affairs. Thus, the IADL is a measure of functional status at the time of followup.

Four variables are derived from the interview with the caregiver. The identity of the caregiver in relation to respondent was assessed -- for the present analysis this is dichotomized as spouse (=1) and other. Caregiver response regarding involvement in the care of the patient was rated low or high (high=1). The caregiver's affect was assessed by the Bradburn Affect Balance Scale. Strain on the caregiver was measured by the Caregiver Strain Index (Robinson, 1983), on which higher scores indicate greater self-perceived strain.

Table 1 reports the means, standard deviations, and ranges of the measures used in the analysis.

[insert Table 1 about here]

Data Analysis

To operationalize the hierarchical research model, stepwise OLS regression analysis was employed (NEW REGRESSION in SPSS). The five control variables were entered in the first three steps of the analysis. The health, support, and functional status variables were then entered on subsequent steps in the order noted above (see Tables 3, 5, and 7). Severity and diagnosis were entered on the same step, as later were formal and informal services; otherwise these variables were entered one by one. Tables 3, 5 and 7 report estimates for the variables of interest on the step in which they were entered. Hypotheses of the directions of the relationships were tested for all of the variables of interest, so one-tailed tests were used. Where a

Table 1

VARIABLES ENTERED INTO THE REGRESSION EQUATIONS PREDICTING EMOTIONAL WELL-BEING AFTER HOSPITALIZATION

	(N)*	Range	Mean	Standard Deviation
Bradburn Affect Balance Score at Baseline	(124)	1-24	13.89	4.40
Bradburn Affect Balance Score at Followup	(118)	2-22	13.80	4.20
P.O.M.S. Anxiety Score at Baseline	(117)	0-3	.72	.80
P.O.M.S. Anxiety Score at Followup	(115)	0-3.33	.62	.73
P.O.M.S. Depression Score at Baseline	(115)	0-2.73	.40	.57
P.O.M.S. Depression Score at Followup	(115)	0-2.56	.35	.48
Number of Days from Hospital Discharge to Followup Interview	(132)	39-194	81.24	28.03
Age	(132)	65.16-91.31	76.08	6.38
Sex:	(132)			
Male	(54)	0		
Female	(78)	1		
Race:	(132)			
White	(104)	0		
Other	(28)	1		
Previous Admissions in Year Prior to Current Hospitalization:	(132)			
None	(88)	0		
Admissions	(44)	1		
Severity of Illness at Baseline	(131)	1-4	3.15	.85
Diagnosis:	(131)			
Hip	(52)	0		
Heart	(79)	1		
Discharge Planning in Hospital:	(118)			
No Planning	(59)	0		
Had Planning	(59)	1		
Contact:				
Number of People from Informal System Seen Once a Week or More	(127)	0-15	3.34	2.71

Total Number of Services Received from Formal Sources (Formal Services)	(132)	0-13	2.17	2.7
Total Number of Services Received from Informal Sources (Informal Services)	(132)	0-13	4.66	3.0
Number of Days in Hospital Between Discharge and Followup Interview (FU)	(132)	0-33	3.03	7.04
Needs Help with Instrumental Activities of Daily Living (IADL)	(129)	0-12	4.46	4.15
Identity of Caregivers from Informal System Interviewed at Followup:	(80)			
Spouse	(31)			
Daughter	(16)			
Son	(9)			
Relative	(11)			
Friend, Neighbor	(13)			
Spouse	(31)			
Other	(49)			
Caregiver's Involvement in Taking Care of Respondent:	(79)			
Rarely, Sometimes	(27)			
A Lot	(52)			
Caregiver Strain Index	(76)	0-12	3.46	3.45
Caregiver's Bradburn Balance Score	(74)	4-25	15.61	4.80

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* 132 respondent and 80 caregivers from the informal support system were interviewed at followup. Ns vary because of missing data on given variables.

hypothesis was not supported, a two-tailed test was applied to test for association in the direction opposite to the hypothesis. Variables significant at $P < .05$ two-tailed were retained for the caregiver analysis. Separate stepwise analyses were conducted for each of the three outcome variables. The sample sizes differ for these three analyses, due to missing values on the outcome variables.

The hierarchical model specified not only that certain variables would significantly predict outcomes on the steps in which they were entered but also that the effects of prior variables would be in part mediated by subsequent variables. (It did not, however, specify the patterns of such mediation.) Evidence of mediation includes a substantial decline in the magnitude of the coefficient for a variable that had a significant coefficient on the step in which it was entered, resulting in a nonsignificant coefficient in the full model. (Becoming nonsignificant in itself could be due merely to loss of degrees of freedom.) If a variable entering on a step in which a prior variable's coefficient declined had a significant coefficient itself, this result strengthened, but was not essential to, an interpretation of mediation. Only the full model (the last equation with all predictors entered) is reported, in Tables 3, 5 and 7.

A different procedure was employed for the caregiver analysis, because the caregiver variables could be measured for only 80 of the respondents. The smaller sample sizes mean that fewer variables could be included in the analyses.

For each of the three outcome measures, a separate stepwise caregiver analysis was run, entering the following variables as a block on the first step:

1) the baseline measure corresponding to the followup outcome measure;

2) the number of days between discharge and followup interview;

3) any of the sex, race or age variables that had coefficients significant at the .05 level (two-tailed test) when entered in first step of the original analysis;

4) any of the health, support or functional variables for which the hypothesized relationship was supported (significant at .05 level with a one-tailed test);

5) any of the health, support or functional variables for which the coefficient was in the direction opposite that hypothesized but was "significant" (two-tailed test).

All of these measures were considered control variables for this analysis.

Subsequent to the entry of the controls variables on the first step, the following variables were entered on separate steps in this order: (1) whether or not the primary caregiver was the patient's spouse; (2) caregiver involvement; (3) caregiver strain; and (4) caregiver Bradburn Affect Balance Scale. Because of missing values on the outcome measures and their baseline counterparts, the actual sample sizes differ for the three outcome analyses and are all below 80.

RESULTS

Effects of Health, Support and Functional Status

Table 2 shows moderately high zero-order correlations between previous admissions to hospital, receiving formal services after hospital; and help with IADL after hospital. These associations suggest that respondents with this constellation of problems had been at a lower level of health and function for some time. Supporting this interpretation is a previous analysis by Lurie, et. al. (1984), showing that the areas in which respondents in hospital anticipated needing help, and those with which they actually received help after discharge, were the same as those with which they had received help before hospitalization. Additionally, there were relatively high zero-order correlations between severity of health problem, being a hip patient, receiving formal services after hospital, and IADL. Previous analyses, (e.g., Lurie et. al., 1984) as well as these zero-order correlations, showed that hip patients, who remained longer in hospital, were more likely to receive discharge planning and needed more help with instrumental activities of daily living immediately posthospital. Discharge planners in hospital mobilized formal services, rather than those from informal providers. Hip patients, however, also had moderately high levels of informal services and moderately high levels of help with IADL. Indeed, people needing help with IADL in general received relatively high levels of informal as well as formal services.

Table 2

ZERO-ORDER CORRELATION MATRIX OF INDEPENDENT VARIABLES WITH AFFECT BALANCE AS THE DEPENDENT VARIABLE (N=97)

	Control Variables				
	Affect Balance (Baseline)	# Days	Age	Sex	Race
Affect Balance (Baseline)					
Number of Days from Discharge to FU Interview	-.122				
Age	-.014	.066			
Sex	.041	-.008	.115		
Race	-.001	-.007	-.144	-.310	
Previous Admissions	-.259	-.082	.039	.170	.094
Severity	.026	.195	.211	.184	-.286
Diagnosis: Hip/Heart	-.134	-.233	-.125	-.206	.334
Discharge Planning	-.125	.050	.184	.284	-.230
Contact	.086	-.138	-.145	-.061	.156
Formal Services	-.214	.064	.245	.292	-.086
Informal Services	.157	.069	-.104	.091	.034
Days in Hospital Between Discharge and FU	.032	.165	-.130	-.197	-.053
Help with IADL	-.180	.124	.229	.314	-.056
Affect Balance (Followup)	.397	-.199	-.038	-.102	.120

	Independent Variables								
	Previous Admissions	Severity	Diagnosis: Hip/Heart	Discharge Planning	Contact	Formal Services	Informal Services	Days in Hospital Between Discharge and FU	with IADL
Severity	.042								
Diagnosis: Hip/Heart	.092	-.779							
Discharge Planning	.109	.504	-.490						
Contact	.053	-.098	.177	-.168					
Formal Services	.333	.354	-.218	.494	-.049				
Informal Services	.026	.275	-.321	-.037	.148	-.222			
Days in Hospital Between Discharge and FU	.065	.237	-.127	.124	.174	.144	.080		
Help with IADL	.403	.434	-.316	.366	.013	.488	.427	.238	
Affect Balance (Followup)	-.330	-.220	.055	-.179	-.011	-.354	-.029	-.248	-.354

-- insert Table 2 about here --

Bradburn Affect Balance. Surprisingly, relatively few of these variables predicted emotional well-being as measured by Bradburn Affect Balance. Table 3 shows that the results for Bradburn Balance did not conform to expectation for our model, with the exceptions of numbers of previous admissions and of severity of hip/heart problem. Having a previous admission (so presumably being in worse health the previous year than the rest of the sample), and having a more severe problem at baseline, predicted a lower Bradburn Balance score. Thus, in this study as in others, ill health is associated with and predictive of poorer mood state. Having discharge planning in hospital, more contact with one's social support system, and more services from the informal system do not compensate for poorer health. Indeed, the negative associations with Bradburn Balance suggest that these variables may be reflecting poorer health and function rather than compensating for it. This interpretation is supported by the high zero-order correlation of severity of health problems with discharge planning and moderately high correlations with formal and informal services. The only other variable which approaches significance in predicting Bradburn Balance is formal services, which is also negatively associated with Bradburn Balance.

-- insert Table 3 about here --

Anxiety. Table 4 shows that zero-order correlations of the independent variables by P.O.M.S. Anxiety were essentially of the same magnitude and direction as for Bradburn Balance. Table 5 shows that severity of health problem again predicts negative mood, in this case higher anxiety. Hip

Table 3

HIERARCHICAL REGRESSION WITH AFFECT BALANCE AS THE DEPENDENT VARIABLE (N=97)

Step*	Variable Entered	b	Beta	T	p	Adjusted R2
1	Affect Balance (Baseline)	.389	.397	4.213		.148
2	Number of Days from Discharge to Followup Interview	-.024	-.153	-1.622		.163
3**	Age	.001	.001	.013	.990	.158
	Sex	-.786	-.091	-.924	.358	
	Race	.926	.091	.915	.363	
4	Previous Admissions	-2.427	-.274	-2.822	.006	.218
5***	Severity	-1.605	-.319	-2.169	.033	.242
	Diagnosis: Hip/Heart	-1.848	-.211	-1.396	.166	
6	Discharge Planning	-.312	-.036	-.328	.744	.234
7	Contact	-.106	-.063	-.667	.507	.229
8****	Formal Services	-.357	-.232	-1.920	.058	.245
	Informal Services	-.159	-.110	-1.026	.308	
9	Days in Hospital Between Discharge and FU	-.089	-.164	-1.612	.111	.260
10	Help with IADL	-.045	-.044	-.295	.769	.251

* In steps where only one variable is entered, the F-test for significance of change in R2 is equivalent to the T-test reported for the variable entered.

** Test for significance of change in R2: F=.82282, p=.485

*** Test for significance of change in R2: F=2.41668, p=.095

**** Test for significance of change in R2: F=1.92571, p=.152

Table 4

ZERO-ORDER CORRELATION MATRIX OF INDEPENDENT VARIABLES WITH ANXIETY AS THE DEPENDENT VARIABLE (N=89)

	Control Variables				
	Anxiety (Baseline)	# Days	Age	Sex	Race
Anxiety (Baseline)					
Number of Days from Discharge to FU Interview	.157				
Age	-.149	.050			
Sex	.159	.029	.151		
Race	-.005	-.012	-.176	-.244	
Previous Admissions	.112	-.071	.003	.297	.043
Severity	.100	.201	.235	.218	-.288
Diagnosis: Hip/Heart	-.071	-.252	-.195	-.22[illegible]	.368
Discharge Planning	.065	.042	.289	.302	-.241
Contact	-.109	-.121	-.161	-.094	.192
Formal Services	.222	.071	.278	.332	-.062
Informal Services	.086	.068	-.093	.207	-.091
Days in Hospital Between Discharge and FU	.089	.166	-.148	-.196	-.007
Help with IADL	121	.128	.220	.487	-.121
Anxiety (Followup)	.485	.053	-.138	.096	-.159

	Independent Variables								
	Previous Admissions	Severity	Diagnosis: Hip/Heart	Discharge Planning	Contact	Formal Services	Informal Services	Days in Hospital Between Discharge and FU	with IADL
Severity	.075								
Diagnosis: Hip/Heart	.042	-.800							
Discharge Planning	.141	.468	-.451						
Contact	.016	-.122	.203	-.217					
Formal Services	.346	.379	-.216	.497	-.055				
Informal Services	-.055	.355	-.406	-.029	.175	-.221			
Days in Hospital Between Discharge and FU	.040	.216	-.154	.073	.156	.158	.091		
Help with IADL	.348	.502	-.436	.430	.001	.513	.427	.212	
Anxiety (Followup)	-.007	.184	-.014	.187	.091	.325	.078	.292	.271

Table 5

HIERARCHICAL REGRESSION WITH ANXIETY AS THE DEPENDENT VARIABLE (N=89)

Step*	Variable Entered	b	Beta	T	p	Adjusted R2
1	Anxiety (Baseline)	.444	.485	5.179		.227
2	Number of Days from Discharge to Followup Interview	-.006	-.024	-.249		.218
3**	Age	-.011	-.097	-.989	.326	.226
	Sex	-.010	-.006	-.066	.948	
	Race	-.332	-.176	-1.801	.075	
4	Previous Admissions	-.092	-.058	-.578	.565	.220
5***	Severity	.419	.485	3.160	.002	.294
	Diagnosis: Hip/Heart	.713	.463	2.926	.005	
6	Discharge Planning	.304	.200	1.882	.064	.316
7	Contact	.050	.166	1.800	.076	.334
8****	Formal Services	.084	.313	2.534	.013	.371
	Informal Services	.039	.150	1.316	.192	
9	Days in Hospital Between Discharge and FU	.017	.173	1.826	.072	.390
10	Help with IADL	.045	.244	1.704	.093	.405

* In steps where only one variable is entered, the F-test for significance of change in R2 is equivalent to the T-test reported for the variable entered.

** Test for significance of change in R2: F=1.27977, p=.287

*** Test for significance of change in R2: F=5.30333, p=.007

**** Test for significance of change in R2: F=3.26129, p=.044

patients were more anxious than heart patients. Contrary to original expectation but similar to results for Bradburn Balance, formal services are predictive of higher anxiety.

-- insert Tables 4 and 5 about here --

Depression. Table 6 shows similar zero-order correlations for P.O.M.S. Depression as for Bradburn Balance and P.O.M.S. Anxiety. Table 7 shows that being a Heart Patient, having Discharge Planning and Formal Services are associated with higher P.O.M.S. Depression. Again contrary to the hypothetical model, these variables consistently predict poorer affect.

-- insert Tables 6 and 7 about here --

Emotional well-being overall. Some measures of poor health -- previous admissions to hospital the preceding year, and severity of health problem -- predict lessened emotional well-being. The provision of services, whether formal services provided in accordance with discharge planning or informal services, does not compensate for or relieve poorer physical health or more severe health problems. Rather, these services appear to be indicators of need (which is not completely controlled for by diagnosis, severity, or needing help with instrumental activities of daily living). Although predictive of emotional well-being, discharge planning and formal service provision do not appear to "cause" poorer emotional well-being, but rather to reflect the associated physical health conditions and the likelihood that hip patients will receive discharge planning. Indeed, when formal services are entered into the hierarchical regression equation predicting anxiety, severity

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Table 6

ZERO-ORDER CORRELATION MATRIX OF INDEPENDENT VARIABLES WITH DEPRESSION AS THE DEPENDENT VARIABLE (N=88)

	Control Variables				
	Depression (Baseline)	# Days	Age	Sex	Race
Depression (Baseline)					
Number of Days from Discharge to FU Interview	.005				
Age	.095	.047			
Sex	.181	.027	.138		
Race	-.156	-.011	-.170	-.240	
Previous Admissions	.207	-.070	.016	.307	.039
Severity	.196	.200	.221	.210	-.285
Diagnosis: Hip/Heart	-.116	-.252	-.177	-.212	.365
Discharge Planning	.185	.040	.277	.295	-.237
Contact	-.202	-.121	-.162	-.083	.192
Formal Services	.370	.069	.256	.322	.054
Informal Services	-.017	.069	-.090	.211	-.092
Days in Hospital Between Discharge and FU	.030	.168	-.213	-.236	-.010
Help with IADL	.286	.126	.197	.481	-.114
Depression (Followup)	.558	.019	.002	.264	-.104

	Independent Variables								
	Previous Admissions	Severity	Diagnosis: Hip/Heart	Discharge Planning	Contact	Formal Services	Informal Services	Days in Hospital Between Discharge and FU	with IADL
Severity	.083								
Diagnosis: Hip/Heart	.033	-.797							
Discharge Planning	.150	.462	-.443						
Contact	.016	-.122	.204	-.217					
Formal Services	.366	.369	-.199	.489	-.055				
Informal Services	-.057	.360	-.414	-.026	.175	-.220			
Days in Hospital Between Discharge and FU	.066	.196	-.123	.044	.166	.114	.104		
Help with IADL	.367	.495	-.424	.421	.003	.500	.438	.173	
Depression (Followup)	.237	.080	.040	.289	-.053	.433	-.009	.070	.393

Table 7

HIERARCHICAL REGRESSION WITH DEPRESSION AS THE DEPENDENT VARIABLE (N=88)

Step*	Variable Entered	b	Beta	T	p	Adjusted R2
1	Depression (Baseline)	.487	.558	6.243		.304
2	Number of Days from Discharge to Followup Interview	.000	.016	.182		.312
3**	Age	-.006	-.073	-.797	.428	.305
	Sex	.182	.179	1.917	.059	
	Race	.013	.010	.110	.912	
4	Previous Admissions	.090	.086	.888	.377	.303
5***	Severity	.078	.137	.898	.372	.314
	Diagnosis: Hip/Heart	.271	.160	1.700	.093	
6	Discharge Planning	.277	.276	2.691	.009	.364
7	Contact	.014	.070	.760	.450	.361
8****	Formal Services	.048	.271	2.204	.031	.389
	Informal Services	.031	.180	1.607	.112	
9	Days in Hospital Between Discharge and FU	.002	.029	.297	.767	.381
10	Help with IADL	.030	.245	1.716	.090	.397

* In steps where only one variable is entered, the F-test for significance of change in R2 is equivalent to the T-test reported for the variable entered.

** Test for significance of change in R2: F=1.36752, p=.259

*** Test for significance of change in R2: F=1.64179, p=.200

**** Test for significance of change in R2: F=2.76268, p=.070

is no longer significant (at the .05 level); and when needing help with IADL is entered, formal services are no longer significant.

Contrary to expectation, contact with the informal support system and days in hospital between baseline and followup Interviews (which presumably reflected continuing episodes of illness or continued health impairment) were never significant predictors of emotional well-being in this analysis. Other studies have suggested that higher levels of contact with family are not necessarily associated with greater life satisfaction in the elderly. In this study, respondents were not asked about what transpired in their contacts; they may simply have been occasions for the receipt of informal services.

Effects of Caregiver Measures

As noted above, a separate set of analyses were carried out using caregiver variables. In these analyses, the original control variables and certain health, support and functional status variables were employed as control variables, all entered as a block on each first step. The caregiver variables were expected to be directly associated with respondent wellbeing. In fact, zero-order correlations indicate moderate associations of P.O.M.S. anxiety with caregiver involvement, caregiver strain, and Bradburn Balance.

In keeping with earlier findings, however, when the caregiver measures were employed in the third phase of the analysis, they were not predictive of emotional well-being. The only exception was for involvement in caring for respondents -- when it was entered into the stepwise regression model predicting respondent anxiety, its coefficient was significantly positive (b =

.427, Beta = .258, t = 2.044, $p < .05$) -- greater involvement indicated greater anxiety. It may be that involvement reflects the respondent's greater need for services because of more severe health problems and greater impairment. In general, however, the absence of predictive relationships between these caregiver variables and respondent emotional wellbeing (after controlling for health and service/support variables) was surprising. (Therefore, the findings in this section are not presented in tabular form.)

DISCUSSION

Overall, the theoretical model of prediction of emotional wellbeing was not confirmed. Only the indicators of health and severity of problems directly predicted wellbeing. The negative association of formal services with emotional wellbeing suggests that both services and wellbeing are essentially dependent upon level of need (and if so, there are probably dimensions of need that are not tapped by the indicators of health and severity). The absence of association of wellbeing with measures of help with instrumental activities of daily living was surprising -- again suggesting that need is prior in its effects on wellbeing.

Many previous studies of support have not distinguished between instrumental and emotional support, nor between the existence of a network of people who could provide support and actual supportive behaviors by network members. Although this exploratory study clearly focused on instrumental support, it addressed only the frequency of contact, not its content or quality. The findings fail to show that, in the presence of severe illness, instrumental support and contact alone lead to greater emotional wellbeing.

Implications for Future Research

Because this analysis is exploratory in nature, a major consideration is what implications it has for future research. A number of recommendations can be made.

In future studies, sample bases should be widened to employ larger samples, inclusive of multiple physical health conditions and states of severity -- including sample members who are essentially "well." Further, the sample for the present study contained members who were initially physically ill or impaired but who were non-psychotic and essentially "mentally well." Replication with a sample known to have some mental health morbidity might produce different results.

The present study measured emotional wellbeing within a relatively short period following hospitalization for an acute illness episode. Although the length of the followup period was controlled for, the mean is 81 days (less than three months) and many respondents were followed-up much earlier. It is possible that with greater passage of time, the effects of importance of severity of the physical health condition at the time of the event might have receded, and that the effects of the nature of formal and informal support, as well as of functional status, might have taken precedence. For example, greater effects of support and contact might have been found had the period between discharge and followup been longer (e.g., one year). Further, greater passage of time may permit contact and support to act as compensations to need, rather than as reflections of need. The result would be a positive relationship bewteen affect and support, which is opposite to the current findings but conforms to theroretical expectations stated at the beginning of this paper.

Studies of predictors of emotional wellbeing among the eldery have reported associations among diverse measures. Sometimes measures of health or function are based upon objective measures, sometimes on self-report; sometimes standardized measures are used, sometimes not. It is noteworthy that in this analysis objective measures were the predictors of emotional wellbeing (measured here with standard instruments). Except for formal services, measures based on self-report did not predict outcomes. It must be noted, however, that four of the five objective variables were the first independent variables entered into the analysis (after the controls), and that the objective measures operationalized different concepts than did the self-report measures. Future analyses should examine relations among and differences between self-report-based and objective measures, since the nature of the variables may have more to do with outcome than previous studies have taken into account.

This analysis operationalized a theoretical model by use of a stepwise regression analysis. Such a hierarchical model explicitly accounts for the high associations found among predictors of wellbeing, rather than simply treating them as a multicollinearity problem. Future multivariate analysis of the predictors of well-being may benefit from greater use of hierarchical models in which assumptions about priority of variables are specified according to theoretical models.

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