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Predictors of General Medical Use Among Individuals Seeking Therapy for Marital and Family Problems

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PREDICTORS OF GENERAL MEDICAL USE AMONG INDIVIDUALS
SEEKING THERAPY FOR MARITAL AND FAMILY PROBLEMS

by

Jacob D. Christenson

A thesis submitted to the faculty of

Brigham Young University

in partial fulfillment of the requirements for the degree of

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ABSTRACT

PREDICTORS OF GENERAL MEDICAL USE AMONG INDIVIDUALS SEEKING THERAPY FOR MARITAL AND FAMILY PROBLEMS

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A number of studies have examined variables associated with medical use. However, most of the studies deal with samples that are not easily generalizable to other populations. In particular, no study is known to have looked at general medical use among people seeking services for marital and family problems. In this study, medical use of participants from the marriage and family therapy services at Brigham Young University Comprehensive Clinic was investigated to determine the best predictors of general medical use. Best subsets multiple linear regression showed that the best overall predictors of general medical use were anxiety and hostility.

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Table of Contents

List of Tables	viii
Introduction.....	1
Literature Review	2
Marriages, Families, and Health	2
Effect of MFT on General Health Care Use.....	4
Predictors of General Medical Use	6
Research Questions	8
Methods.....	9
Sample	9
Procedure	10
Measures	11
Multidimensional Health Profile-Psychosocial Functioning (MHP-P).....	11
Patient Assessment Questionnaire (PAQ)	11
Family Emotional Involvement and Criticism Scale (FEICS)	12
Revised Dyadic Adjustment Scale (R-DAS).....	12
Family Assessment Device (FAD)	12
Brief Symptom Inventory (BSI)	13
Analysis of Data	13
Research Question 1.....	13
Research Question 2.....	13
Results.....	14

Research Question 1	15
Research Question 2	16
Within-Component Analyses.....	16
Across-Component Analysis	17
Discussion	18
Limitations	23
Recommendations	23
References	25
Appendix A: Measures	32
Appendix B: Consent to Be a Research Subject.....	47
Tables	49

List of Tables

Table 1-Summary statistics for the variables within each of the four components.	49
Table 2-Results from the within-component multiple regression analyses with the standardized coefficient and the amount of variance for each variable.....	51
Table 3-Results from the full model multiple regression analysis with the standardized coefficient and the amount of variance for each variable	52

Introduction

For several years a leading view in both mental health and medicine has been that functioning of the mind and body are independent of one another (Pelletier, 2002). Nonetheless, with the advent of techniques such as brain scanning and cognitive mapping, many have come to believe that this view “does not do justice to the lived reality of human experience” (Bracken & Thomas, 2002, p.1434). Some support for an integrated view of health has been found in studies which show that psychosocial functioning can have a significant impact on physical health (e.g., Kiecolt-Glaser & Newton, 2001). Nevertheless, mental health services have largely been considered less important than general medical care when considering an individual’s overall well-being (Pelletier, 2002). Consequently, marriage and family therapists, like those in other mental health professions, are in a position of defending their place in the greater health care market.

According to Cummings (1997) one of the most compelling ways to show the benefit of mental health services is to demonstrate what has been termed an “offset effect” (Shemo, 1985-86). The basic premise of the offset effect (also referred to as medical offset) is that the cost of mental health treatment is “offset” by reductions in use of other medical services following intervention (Cummings, 1997). In a review of 91 articles examining the ability of individual psychotherapy to reduce medical service use, Chiles, Lambert, and Hatch (1999) reported that 90% of these studies showed decreases in medical use, with an average reduction of 23.6%.

While a number of studies have investigated this phenomenon for individual therapy (e.g., Kessler, Steinwachs, & Hankin, 1982), few studies are known to have expressly studied the effect of marriage and family therapy (MFT) on general health care use. Those that have attempted to show an offset effect for MFT have reported encouraging results (e.g., Law & Crane, 2000; Law, Crane, & Berge, 2003). For example, Law and Crane (2000) reported that those who participated in marriage and family therapy reduced health care utilization by an average of 21.5%. Law et al. (2003) found that high utilizers of health care showed a 53% reduction in health care use following MFT.

Although studies demonstrating offset with MFT provide evidence of a relationship between medical use, marital functioning, and family functioning, the specific variables affecting medical use for this population are not well understood. As a result, practitioners are limited in their ability to intervene in ways that would decrease potential overuse of medical services and at the same time enhance their standing in the greater health care market. Therefore, the purpose of this research was to identify predictors of general health care use among clients seeking therapy for marital and family problems.

Literature Review

Marriages, Families, and Health

The effect of marital/family functioning on physical health can be traced to changes in physiological markers, as well as through psychosomatic processes. In a review of 64 articles, Kiecolt-Glaser and Newton (2001) provide an excellent overview of

how functioning can directly affect physiology. They note that as marital conflict develops, key alterations are observed in levels of neurotransmitters, as well as in the functioning of the immune, endocrine, and cardiovascular systems. They go on to show that such alterations have been shown to weaken the immune system and cause the cardiovascular system to become more reactive, predisposing a person to infectious diseases, hypertension, heart disease, impaired wound healing, and increased pain with rheumatoid arthritis.

Though the review by Kiecolt-Glaser and Newton (2001) was limited to marital relationships, other work has demonstrated that physiological processes can be affected by specific family interactions as well (e.g., Cohen, 1999). A salient example of this can be found in research on families with high expressed emotion (EE), or in other terms, families who demonstrate high levels of criticism, hostility, or emotional over-involvement (Heru, 2000). EE has been linked to health problems as diverse as childhood epilepsy (Otero & Hodes, 2000) and inflammatory bowel disease (Vaughn, Leff, & Sarner, 1999). Worrall-Davies, Owens, Holland, and Haigh (2002), in a study of childhood type 1 diabetes, illustrate the impact of EE on health by reporting that paternal hostility explained up to 29% of the variance in a key physiological indicator of risk. However, since only one characteristic of EE (i.e., hostility) was significant, it is difficult to draw broad conclusions.

While direct effects on physiology are often most convincing, less direct effects on health have been demonstrated as well. For example, depression, which has been linked to marital discord (Beach, Sandeen, & O'Leary, 1991), has been shown by Franks

and colleagues to increase cardiovascular risk behaviors such as lack of exercise, poor diet, and smoking (as cited in Williams, Frankel, Campbell, & Deci, 2000). Depression has also been shown to contribute to poor management of conditions such as hypertension and diabetes (Mauksch, 1999). Kiecolt-Glaser and Newton (2001) also found in their review that functioning, in addition to its effects on physiology, can have an important impact on health habits and illness outcome. Cohen (1999), in support of the idea that families impact illness outcomes, points out that family dynamics have been shown to have a negative effect on the course of diabetes, cystic fibrosis, abdominal illnesses, and asthma.

Knight, Green, and Hinson (1997) give another example of how functioning can operate indirectly, in this case by perpetuating symptoms. They describe a feedback loop operating in a marital dyad where an increase in pain was used by one partner to exact changes from the other. Rolland (1998) describes a case where conflict between a heart patient's wife and mother resulted in increased chest pains. Finally, Kiecolt-Glaser and Newton (2001) support this position by citing evidence in their review that marital functioning has in fact been observed to influence symptom manifestation.

Effect of MFT on General Health Care Use

Regardless of the mechanism (i.e., physiological or psychosocial), the effect of marital/family functioning on physical health is evident. Despite a long history of individual therapy offset studies, only recently have efforts been made to investigate this concept in relation to treatment with MFT. Law and Crane (2000) reported an average offset of 21.5% following participation in MFT. They found that marital couples reduced

use by 21% and individuals who were the focus of treatment (i.e., the identified patient) decreased use by 9.5%. Law et al. (2003) investigated the influence of MFT among high utilizers of health care and reported overall average reductions of 53% following therapy. Furthermore, those who participated in marital therapy and those considered the identified patient in family therapy both showed a 50% reduction following MFT. These findings are remarkable when compared to those reported by Kessler et al. (1982). In this study, the authors found only a 1.5% decrease in utilization for those who participated in MFT. However, as noted by Law and Crane, the findings of the Kessler et al. study are likely biased since none of the therapists was licensed in MFT and no effort was made to determine the qualifications of the MFT providers. The effort of Law and colleagues is the only known attempt to investigate the influence of current marriage and family therapy practices on general health care utilization.

Other studies looking at the relationship between marital/family variables and health care utilization provide further evidence of the potential for a decrease in medical use following MFT. Prigerson, Maciejewski, and Rosenheck (1999) found that an increase in marital quality was related to reductions in the use of health care. O'Farrell et al. (1996) showed that alcoholics decreased utilization after participating in behavioral marital therapy and that the actual cost of the treatment proved to be less than the typical treatment course. The findings of O'Farrell et al. are limited however, since only utilization of alcohol-related services were measured and no efforts were made to look at general medical use or use of other family members.

By not addressing family members' utilization, O'Farrell et al. (1996) potentially overlooked an important argument for the effectiveness of MFT in reducing health care utilization, namely, that in addition to affecting the utilization of those who are the focus of treatment, MFT might also benefit other family members. Holder and Blose (1987) reported an average reduction in health care costs of \$21.10 per person, per month for family members of those who received mental health treatment. Law and Crane (2000) found benefits for family members as well and reported an overall decrease in utilization by family members of 30.5%. In addition, Law et al. (2003) found a 57% reduction for those who participated in family therapy, while not being the focus of treatment themselves. Nevertheless, the prospect of health care use reductions in family members remains to be established, since others have not found this same effect (e.g., Goldberg et al., 1981).

Predictors of General Medical Use

While these studies provide information about the effects of family therapy on general health care use, they do not directly address the issue of what aspects of health and relationship functioning affect (or at least are related to) the use of general medical services. To date no study is known to have addressed this question among those who seek MFT services. Instead, studies attempting to discover predictors of health care use have often focused on populations with particular physical health problems. For example, Mayou et al. (2000) found that anxiety and depression after myocardial infarction predicted primary care service use and chest pain reporting. The authors also found that

anxiety and depression predicted poor outcome for aspects of quality of life such as physical functioning and general health.

Likewise, Chacko, Harper, Gotto, and Young (1996) found that DSM-III-R Axis I diagnoses were found to predict hospital utilization following cardiac transplant.

Nouwen, Freeston, Labbe, and Boulet (1999) compared asthma patients who had used the emergency room at least twice over two years against those who had less than two visits.

They matched patients according to age, sex, and corticosteroid use and found that asthma status did not distinguish between the two groups. However, they did find that higher utilizers showed greater levels of panic/fear, greater perceived interference, and diminished self-efficacy. In addition, the authors found an indirect effect for depressive mood and anxiety, health locus of control, and self-focused attention. Although these studies are centered on a specific health problem, they provide evidence that psychosocial functioning has an influence on health care use.

In a study examining the influence of race on health care use, Miller et al. (1997) found that overall African American older persons were less likely than White older persons to make use of medical services. This was particularly true with regard to hospital services. They also found that factors such as having health insurance, physical limitations, and poor health status were consistent predictors of more physician contact. Janicke, Finney, and Riley (2001) found that the best predictor of children's health care use is prior health care use. Moreover, they found acute recurring illness, the mother's past health care use patterns, and child pain to be significant predictors of children's health care use. When past use was excluded from the analyses, the results revealed that

the mother's level of concern for the child's health was the preeminent predictor of future use, while the child's health status and maternal functioning were also found to be significant. The study included variables related to family functioning in the analysis. However, none were found to be influential. Riley et al. (1993) also investigated the influence of family functioning on children's health care use and found that family conflict predicted higher amounts of medical service use. The authors also found that depression and minority status were predictive of lower use for children. Finally, the authors noted that the child's health and the mother's health care use patterns were related to children's medical use.

Research Questions

Although a number of studies have found aspects of psychosocial functioning to be related to health care use, none have looked specifically at general medical use among those seeking therapy for marital and family problems. Given that relationship problems are more debilitating among this group, it is likely that related variables would have a greater impact on general health care use. In addition, of the articles reviewed, only Janicke et al. (2001) and Riley et al. (1993) used a broad set of variables instead of focusing on limited aspects of functioning. While previous findings are informative, the specificity of the populations makes drawing broad conclusions problematic. Consequently, attempting to explain the impact of psychosocial functioning on general health care use among MFT participants is difficult due to the lack of comparable findings. Therefore, the first research question was:

1. What relationships exist between psychosocial variables and volume of medical use among individuals seeking therapy for marital and family problems?

While discovering basic relationships between variables is important, univariate analysis does not account for the potential effect of other important variables.

Consequently, the strength of findings from bivariate analysis is limited. In order to augment bivariate analysis, multivariate analysis is needed to control for the effect of additional variables. In this way multivariate analysis can be used to determine variables that serve as the best set of predictors. Accordingly, the second research question of interest was:

2. What psychosocial variables function as the best overall set of predictors of general medical use?

Methods

Sample

The participants of the study were individuals and couples who requested services for relationship problems from the Comprehensive Clinic at Brigham Young University. A sample of 60 individuals was gathered from those who received marital and/or family therapy as provided by student interns associated with the Marriage and Family Therapy graduate program at Brigham Young University. Each participant was compensated between \$25.00 and \$35.00 for his or her participation. Of those who participated, 43% ($n = 26$) were male and 57% ($n = 34$) were female. Information concerning participant's racial/ethnic background and education showed that the sample was predominately Caucasian (95%) and that 52% had completed at least a college degree. In terms of

marital status, 95% were married, while the other 5% were either separated or divorced. Finally, the mean number of self-reported medical visits was 2.42, with a standard deviation of 2.84. Table 1 details the mean (or % of sample) and standard deviation for the various demographic variables, as well as for all other independent variables used in the analysis.

Procedure

Participants had requested services from the clinic prior to being given information about possible inclusion in the study. Contact regarding participation was made over the phone, during the clinic's intake procedures. Intake officers were trained in monthly meetings where instructions were given concerning this initial contact. In exchange for the intake officer's time and cooperation, refreshments were provided in these meetings. During the clinic intake procedure a brief explanation of the study and an explanation of the voluntary nature of participation were given. In addition, during this initial call a verbal consent to participate was obtained when applicable. Those who consented to participate were asked to complete a packet of questionnaires that was then mailed to them (Appendix A). Included in the packet was the consent form (Appendix B). Of the assessment packets that were sent, approximately 50% were returned. No differences are known to exist for those who chose not to return the packets.

After the assessments had been returned, the individual was formally included as a participant in the study. In order to protect confidentiality, all private health information was kept in a locked cabinet. Only the principal investigators had access to private health information. Each case was given a case number and a code sheet linking case number

and client information was made to aid future follow-up efforts. After the key had been made, all identifying information was blacked out on the assessment packet.

Measures

Participants filled out six different measures, namely, the Multidimensional Health Profile-Psychosocial Functioning, the Patient Assessment Questionnaire, the Family Emotional Involvement and Criticism Scale, the Revised Dyadic Adjustment Scale, the Family Assessment Device, and the Brief Symptom Inventory (Appendix A). In addition, information about participant's age, gender, race/ethnicity, income level, education, and marital status was gathered using a demographic questionnaire developed for the study (Appendix A).

Multidimensional Health Profile-Psychosocial Functioning (MHP-P). The MHP-P is a recently developed measure used to assess psychosocial functioning. In particular, the MHP-P addresses life stress, coping skills, social resources, and mental health as indicators of this concept. To establish reliability Ruehlman, Lanyon, and Karoly (1998) employed test-retest procedures and found significant correlations ($p < .001$) for each of the scales.

Patient Assessment Questionnaire (PAQ). The PAQ is a comprehensive measure addressing various aspects of medical use and quality of life. Participants were only asked to fill out the medical use subscale of this measure. This section asks for specific information about use of medical services within the last six months. The question of interest for this study addressed volume of health care use. At this time no psychometric

information has been released by Wells (1999), nor have any other psychometric analyses been published.

Family Emotional Involvement and Criticism Scale (FEICS). The measure consists of scales for perceived criticism (PC) and emotional involvement (EI) and was developed to address the concept of expressed emotion. Shields, Franks, Harp, McDaniel, and Campbell (1992) detailed psychometric information for the measure and reported Cronbach's alpha to be .82 for the PC subscale and .74 for the EI subscale. The authors also reported that confirmatory factor analysis revealed all questions loaded on one of the two factors (and not the other) with loadings greater than .50.

Revised Dyadic Adjustment Scale (R-DAS). The R-DAS is a measure of dyadic adjustment based on the scale developed by Spanier (1976). The measure provides a total R-DAS score (range 0 - 69, $\alpha = .90$), as well as scores for the following three subscales: consensus ($\alpha = .81$), satisfaction ($\alpha = .85$), and cohesion ($\alpha = .80$) (Busby, Crane, Larson, & Christiansen, 1995). Of particular interest for this study is the established cutoff of 48 for the total score, which allows a distinction to be made between distressed and non-distressed couples (Crane, Middleton, & Bean, 2000).

Family Assessment Device (FAD). The FAD is a well-studied measure that uses a Likert type scale to assess family functioning. The measure consists of numerous scales, among which are problem solving, communication, roles, affective regulation, affective involvement, general family functioning, and behavior control. Though the subscales have demonstrated good internal consistency with Cronbach's alpha ranging from .72 to .92 (Epstein, Baldwin, & Bishop, 1983), some have argued that overlap between

subscales warrants a complete reorganization of the measure (Ridenour, Daley, & Reich, 1999). Nonetheless, scores from the general family functioning scale and the behavior control scale are generally seen as measuring independent aspects of family functioning (Ridenour, Daley, & Reich, 2000).

Brief Symptom Inventory (BSI). Three scales are designed to measure global aspects of mental health, namely, the general severity index, the positive symptom total, and the positive symptom distress index. In addition, there are nine subscales designed to measure somatization, obsessive-compulsivity, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Derogatis (1993) investigated the psychometrics of the measure and reported internal consistency coefficients for the nine subscales ranging from .71 for psychoticism to .85 for depression. Test-retest analysis was performed for the global scales and ranged from .80 for the positive symptom total to .90 for the general severity index.

Analysis of Data

Research question 1. In order to determine the presence of a relationship between psychosocial variables and general medical use, Pearson's product-moment correlation was used. Variables that showed a significant relationship to general medical use were included in all subsequent analyses.

Research question 2. In order to determine the key predictors of medical use, best subsets multiple regression (MINITAB 13) was employed as part of a two-tier procedure. First, variables were divided into four sets, each of which could be considered independently useful for predicting and assessing general medical use. These four sets

were demographics, mental health, social functioning, and relationship functioning. A regression model was then developed for each of the four sets or components using best subsets multiple regression. Best subsets regression examines all possible combinations for a given number of variables and determines which are best according to various criteria. Within the four separate component analyses, the combination of variables that produced the largest adjusted multiple correlation squared value was selected. Mallows' C-p statistic was also evaluated in determining the best model. A complete listing of variables included in the within-component analyses is found in Table 1. Following the procedure of Janicke et al. (2001), variables with $p < .15$ were considered significant in the four within-component analyses.

The second tier of the analysis consisted of an across-component best subsets regression made up of the significant variables from the four within-component analyses. As in the within-component analyses, the combination of variables that resulted in the highest adjusted multiple correlation squared was selected. Any variable that was found to be significant at $p < .05$ in the final model was considered a significant predictor.

Results

In order to ensure the validity of the statistical findings the dependent variable (i.e., physician visits) was checked for normality. The normality plot revealed that the distribution of physician visits was skewed toward more visits. Consequently, the square root transformation was used to improve normality.

Independent variables that did not follow a normal distribution were also normalized in an effort to decrease the risk of non-linearity and heteroscedasticity. A

number of the independent variables did not follow a normal distribution and were transformed using the square root or the logarithmic transformation to improve normality. Two variables that were not able to be normalized were transformed to dichotomous variables. One other variable was transformed using the exponential transformation in order to improve normality.

Additional regression diagnostics were calculated to determine the presence of any violations of multiple linear regression assumptions (e.g., heteroscedasticity, autocorrelation, and multicollinearity). Regression diagnostics were calculated for each of the within-component analyses and for the full across-component analysis. The results of these analyses showed that the models did not violate the major assumptions on which multiple linear regression is based.

Research Question 1

The bivariate analyses (Table 1) showed that for demographics, no variables were significantly correlated to general medical use. Under social functioning, total social support received ($p < .05$) showed a positive correlation with general medical use. Among the mental health variables, anxiety ($p < .05$) and hostility ($p < .05$) showed a positive relationship with general medical use. Of the relationship functioning variables, perceived criticism ($p < .05$) was significant and showed a negative relationship with general medical use.

Table 1 & 2 About Here

Research Question 2

Within-component analyses. Best subsets regression for the demographic component showed that the greatest amount of the variance was accounted for by a model including only gender as an independent variable ($R^2_{adj} = .042$) (Table 2). The C-p statistic also supported a model including gender as the only variable. Accordingly, age, marital status, race/ethnicity, income, and education were excluded from the model. Gender showed a positive relationship with general medical use and accounted for 5.8% of the variance. The relationship was significant according to the criterion of $p < .15$ and indicates that females tended to show a higher amount of general medical use than males.

For social functioning, evaluation of the adjusted multiple correlation squared and the C-p statistic showed that the best model included total social support and number of stressful events experienced during the last year ($R^2_{adj} = .097$). Responses for coping, global stress, and negative social exchange were not significant. Total number of stressful events experienced within the last year showed a tendency toward fewer physician visits as the total number of stressful experiences increased. However, this finding did not reach the $p < .15$ significance level. The reported level of social support received showed a significant positive relationship with medical use ($\beta = .327, p < .05$), and accounted for 11.0% of the remaining variance after adjusting for the other variable within the model. Together the two variables accounted for 12.8% of the variance in general medical use.

According to the adjusted multiple correlation squared, the best subsets regression for mental health included the variables depression, anxiety, hostility, total number of symptoms, and life satisfaction ($R^2_{adj} = .192$). The best subsets regression results

indicated that in addition to having the highest adjusted multiple correlation squared, the C-p statistic was minimized in this model. Only somatization was excluded from the model. Lower levels of depression were found to predict higher reported use of general medical services ($\beta = -.444, p < .05$). Higher levels of anxiety ($\beta = .345$) and hostility ($\beta = .278$), as well as greater life satisfaction ($\beta = .265$) predicted higher reported use of health care services. These variables were all significant according to the $p < .15$ criterion. Depression accounted for the greatest proportion of the remaining variance (after adjusting for other variables) with 9.7%. A non-significant positive relationship between total number of reported symptoms and health care use was also found.

According to the C-p statistic and the adjusted multiple correlation squared, the best subsets regression for relationship functioning included the variables perceived criticism (PC), emotional involvement (EI), and general family functioning ($R^2_{adj} = .086$). Behavior control and dyadic distress were excluded. Only general family functioning was found to be significant at the $p < .15$ level and after adjusting for other variables accounted for 3.7% of the remaining variance. The relationship between general family functioning and medical use showed that better family functioning was predictive of greater general medical use ($\beta = -.228$). A non-significant negative relationship was found for both EI and PC, indicating that lower levels of EI and PC would predict more frequent use of health care.

Across-component analysis. The seven variables found to be significant predictors from the within-component analyses were entered into the across-component best subsets regression. Based on assessment of the adjusted multiple correlation squared, a model

with five of the seven variables from the within-component analyses was designated ($R^2_{adj} = .221$). In addition, the best subsets regression showed that this model minimized the C-p statistic. Gender and general family functioning were excluded from the full model. Of the remaining five variables, hostility and anxiety reached the $p < .05$ cutoff for significance. After adjusting for the other variables in the model, hostility and anxiety accounted for 10.8% and 8.6% of the remaining variance, respectively. The full model was found to account for 28.7% of the variance ($F(5, 54) = 4.35, p < .01$). As was established in the within-component analyses, higher levels of hostility ($\beta = .349$) and anxiety ($\beta = .360$) were predictive of greater general medical use. Evaluation of the standardized multiple regression coefficient and the partial correlation squared shows that both hostility and anxiety serve as the best predictors within this model. The findings from the full across-component analysis are summarized in Table 3.

Table 3 About Here

Discussion

The results of the current study provide the only known information concerning predictors of general medical use among people seeking services for marital and family problems. Despite the supposition that relationship functioning would be more influential among this population, none of the related variables were found to be significant (after adjusting for other predictors). Of the various predictors, anxiety and hostility emerged as the best predictors within the final model of this study.

The finding for anxiety is consistent with results reported by Mayou et al. (2000), who found that anxiety was a significant predictor of primary care use following myocardial infarction. Likewise, Nouwen et al. (1999) showed that a greater level of panic and fear among asthma patients was characteristic of higher utilizers of medical services. Finally, Janicke et al. (2001) reported that when past use was ignored, mother's worry was the best predictor of children's prospective general medical use. The study by Janicke et al., in particular, offers support for a view that anxiety may encourage unrealistic health concerns that eventually lead to superfluous consultation with health care providers.

Past research that has investigated the impact of hostility on health functioning also provides support for the validity of the results from the present study. For example, Sirois and Burg (2003) reviewed studies on cardiovascular disease and concluded that hostility and anger is generally related to greater morbidity and mortality. Raikkonen, Matthews, and Salomon (2003) found that hostility contributed to metabolic risk factors for cardiovascular disease among children and adolescents. In the only known study to detail the effects of hostility on general medical use, Riley et al. (1993) reported that conflict was a significant predictor of children's health care use.

The significant effect due to hostility is consistent with the psychosocial vulnerability model. As described by Kivimaki et al. (2003), the model suggests that individuals who show more hostility would be disconnected from beneficial support systems, which would increase the risk of unfavorable health outcomes. Interestingly, distressed dyadic adjustment, which would fit well within this model, was not found to be

predictive of greater general medical use. The finding that dyadic distress did not predict greater medical use also appears to contradict the findings of Prigerson et al. (1999) who found that as marital satisfaction decreased health care use increased.

Siegmán (1993) provides the foundation for another view of the way hostility and anxiety could affect general medical use. The author argues that these variables can be seen as significant elements within the concept of stress. It can therefore be argued that experiencing hostility and anxiety would result in the initiation of what has been termed the “stress response,” which is characterized by the release of adrenal and pituitary hormones (e.g., cortisol) that promote adaptation (Selye, 1993). Although the stress response facilitates adaptation, exposing the body to the associated hormones can also adversely affect physiological functioning. For example, adrenal steroids released to regulate stress have also been shown to damage or destroy neurons (McEwen & Mendelson, 1993). Other health concerns related to the stress response include susceptibility to infectious disease and suppressed immune functioning (Stein & Miller, 1993), as well as cardiovascular reactivity (Katkin, Permitt, & Wine, 1993). Although chronically high levels of stress would be expected to have the greatest effect, Kiecolt-Glaser and Newton (2001) argue that even small (and frequent) physiological changes related to the stress response can have a significant negative impact on health. Thus, it is conceivable that individuals who experience heightened levels of anxiety and hostility would be susceptible to more health problems and could therefore be expected to require and utilize more medical services.

Research investigating the effect of hostility and anxiety on physical health provides some support for this interpretation. For example, Kiecolt-Glaser and Newton (2001) argue that ample evidence shows hostility in marriage can promote stress reactions such as cardiac hyperactivity, increased blood pressure, and increased cortisol response. Jonas and Lando (2000) found that anxiety, for both women and men, predicted the development of high blood pressure. Tyrer (1982) argues that autonomic arousal associated with anxiety increases the likelihood of somatic complaints and stress related conditions (e.g., headaches). The available evidence supports the contention that individuals who show higher levels of anxiety and hostility could be expected to experience more medical problems and therefore utilize general medical services more frequently.

In a study similar to the present research, Janicke et al. (2001) employed a significance level of $p < .10$ in the final model to determine the best predictors of general medical use. The author's argument was that variables at this significance level provide valuable information about general medical use that may be lost with the application of more stringent criteria. Using the $p < .10$ standard in the current study adds more information about patterns of health care use since total social support would then be considered a significant predictor. The direction of the relationship for this variable indicates that people who experience high levels of social support could be expected to utilize health care services more than those who do not. The notion that better functioning could promote more use of medical care would challenge findings from other studies that have found only poor functioning to contribute (e.g., Janicke et al., 2001).

Assuming that using a $p < .10$ significance level is sufficient, the results could be seen as offering some support to the proactive coping model outlined by Aspinwall and Taylor (1997). The conceptual basis of this model lies in the viewpoint that people who amass coping resources, and actively organize beforehand, are likely to act in ways that prevent or diminish the negative effects of presupposed stressful situations. Applying this model to medical use would indicate that those who receive more social support would be able to use preventive health care services more effectively in an effort to moderate or circumvent significant health problems in the future. For example, a mother with small children who can rely on others for supplemental child care may be more likely to participate in health screenings and regular check-ups. Accordingly, it could be expected that some people who experience an enhanced social network as a result of MFT would show an increase in medical use following therapy.

This observation at first appears to contradict the findings of Law and Crane (2000) and Law et al. (2003) who found an overall reduction in general medical use following marriage and family therapy. Nevertheless, it is also conceivable that individuals who require high amounts of social support find themselves in circumstances that are overwhelming and are unable to meet the requirements of daily life. Thus, while it is conceivable that better psychosocial functioning contributes to greater general medical use, it is also possible that receiving high levels of social support is indicative of stressful life events. Viewing high social support as an indicator of stress would add further support for a stress response model of general medical use. However, regardless of the effect due to social support, the results of this study strongly implicate hostility and

anxiety as the best predictors of general medical use. Consequently, focusing on these aspects of functioning would likely prove most useful in terms of advancing better health functioning and promoting reductions in general medical use following MFT.

Limitations

Although the findings provide insight into health care use among MFT clients, there are limitations which warrant attention. For example, self-report was used to measure general medical use, making the scale vulnerable to recall error (e.g., Roberts, Bergstralh, Schmidt, & Jacobsen, 1996). In addition, given the findings of Riley et al. (1993) and Janicke et al. (2001) regarding the influence of mother's functioning on children's medical use, the influence of functioning by significant family members requires attention. While the set of variables used was more comprehensive than in other studies, physical health, and functioning of significant family members, was not taken into account. Finally, the lack of longitudinal information limits the ability to draw conclusions about how changes in health and psychosocial functioning affect general health care use (Janicke et al., 2001).

Recommendations

Future studies would benefit from employing a design which is longitudinal in nature. Doing so would enable stronger conclusions about the influence of health and psychosocial variables on general medical use. In addition, predictors need to be delineated according to those who need health care and those who over-utilize services. For example, what variables account for those who should be receiving more medical services (e.g., those with a chronic illness) but do not participate. Finally, the findings of

Law and Crane (2000) and Law et al. (2003) indicate that family functioning can have a significant impact on family members who are not the focus in therapy. Therefore, further research is needed to determine what psychosocial variables influence general medical use among other family members.

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Appendix A

Measures

Demographics

- 1) What is your age (in years)? _____
- 2) What is your gender? (Circle one)
 - A. Male
 - B. Female
- 3) What is your race? (Circle one)
 - A. Hispanic
 - B. African American
 - C. Asian
 - D. Pacific Islander
 - E. Caucasian
 - F. Other _____ (please specify)
- 4) How much does your household earn annually? (Circle one)
 - A. Under \$10,000
 - B. \$10,000 to \$19,999
 - C. \$20,000 to \$29,999
 - D. \$30,000 to \$39,999
 - E. \$40,000 to \$49,999
 - F. Over \$50,000
- 5) What is your highest level of education? (Circle one)
 - A. Some high school
 - B. High school diploma
 - C. Some college
 - D. College degree
 - E. Masters degree
 - F. Ph.D.
- 6) How many hours do you work per week? _____
- 7) What is your religious affiliation? _____

- 8) What is your marital status?
- A. Single
 - B. Married
 - C. Separated
 - D. Divorced
 - E. Other _____ (please specify)

Multidimensional Health Profile-Psychosocial Functioning

Sample items:

- | | | |
|--|------------------------------------|---------------------------|
| 18. Overall , how much stress or strain have you felt over the past year ? | No Stress
At All
1 2 3 | A Great
Deal
4 5 |
| 25. Over the past year , how much emotional support did you receive from close friends or family? | None
1 2 3 | A Great
Deal
4 5 |
| 28. Over the past year , how much advice, information, or guidance did you receive from close friends or close family? | None
1 2 3 | A Great Deal
4 5 |
| 35. Over the past year , how often did your close friends or close family make fun of you, gossip about you, or reject you? | Never
1 2 3 | Very Often
4 5 |
| 37. Over the past year , how often were your close friends or close family demanding, distracting, or in your way? | Never
1 2 3 | Very Often
4 5 |

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Patient Assessment Questionnaire

IMPORTANT INSTRUCTIONS - PLEASE READ

1. Please answer every question unless an arrow tells you to skip a question.

- 2. Answer the questions by circling your answer or writing your answer in the space provided.
- 3. If you are not sure of an answer, please give your best estimate.
- 4. If you have any questions about how to complete this form, please call Russell Crane, (801) 422-3888.

This section is about visits you have made to doctors and other health care professionals

1. During the past 6 months, how many total nights did you stay in a hospital or other treatment facility for treatment of physical problems?

WRITE IN THE NUMBER OF DIFFERENT NIGHTS:

IF NONE, WRITE IN 00 AND GO TO Q4

2. Were the costs for your hospital stay completely covered by health insurance, paid for entirely out-of-pocket by you, or partly paid by insurance?

(Circle One)

- Completely covered by health insurance1 ► GO TO Q4
- Paid for entirely out-of-pocket.....2
- Partly covered by health insurance3

3. Roughly how much did you have to pay in total for these hospital stays during the past 6 months?

WRITE IN THE AMOUNT: \$

(WRITE IN 00000 IF NONE)

4. Have you ever been an overnight patient in a hospital for any emotional or mental problems?

(Circle One)

- Yes, in the past six months1
Yes, but not in the past six months2 ► GO TO Q8
No.....3 ► GO TO Q8
-

5. During the past 6 months, how many total nights did you stay in a hospital or other treatment facility for any personal or emotional problems? Count all overnight stays.

WRITE IN THE NUMBER OF NIGHTS:

IF NONE, WRITE IN 00 AND GO TO Q8

6. Were the costs for your hospital stay completely covered by health insurance, paid for entirely out-of-pocket by you, or partly paid by insurance?

(Circle One)

- Completely covered by health insurance1 ► GO TO Q8
Paid for entirely out-of-pocket.....2
Partly covered by health insurance3
-

7. Roughly how much did you have to pay in total for these hospital stays during the past 6 months?

WRITE IN THE AMOUNT: \$

(WRITE IN 00000 IF NONE)

8. During the past 6 months, how many visits did you make to a hospital emergency room?

WRITE IN THE NUMBER OF VISITS:

IF NONE WRITE IN 00 AND GO TO Q12

9. During how many of these hospital emergency room visits did you discuss personal or emotional problems such as emotions, nerves, alcohol, drugs, or mental health?

WRITE IN THE NUMBER OF VISITS:

IF NONE, WRITE IN 00

10. Roughly how much did you have to pay in total out-of-pocket for hospital emergency room visits you made during the past 6 months?

WRITE IN THE AMOUNT: \$

(WRITE IN 00000 IF NONE)

11. Were any of these visits to hospital emergency rooms which were not covered by your regular health plan?

(Circle One)

Yes1
No.....2

12. During the past 6 months, how many visits did you make to medical providers such as primary care or family doctors, internists, surgeons or medical specialists, physicians assistants or medical nurse practitioners? (This question refers to office or clinic visits. Please do not include visits to a hospital emergency room, overnight stays in a hospital, nursing home, or other health care facility.)

WRITE IN THE NUMBER OF VISITS:

IF NONE WRITE IN 00 AND GO TO Q17

13. In the past 6 months, were the costs for your visits completely covered by health insurance, paid for entirely out-of-pocket by you, or partly paid by insurance?

(Circle One)

Completely covered by health insurance1 ► GO TO Q15
Paid for entirely out-of-pocket.....2
Partly covered by health insurance3

14. Roughly how much did you have to pay in total for these visits during the past 6 months?

WRITE IN THE AMOUNT: \$

IF NONE, WRITE IN 00000

15. Were any of these visits to health professionals who were not covered by your regular health plan?

(Circle One)

Yes1
No.....2

16. During how many of these visits to a medical provider did you bring up or discuss personal or emotional problems such as emotions, nerves, alcohol, drugs, or mental health?

WRITE IN THE NUMBER OF VISITS:

IF NONE, WRITE IN 00

17. In your lifetime, have you ever received counseling or psychotherapy (individual, group, or family) from a health professional?

(Circle One)

Yes1
No.....2

18. In your lifetime, have you ever visited a psychiatrist, psychologist, social worker, psychiatric nurse, or counselor?

(Circle One)

Yes1
No..... 2 ► IF NO SKIP Q19-Q27

19. During the past 6 months, how many visits did you make to psychiatrists, psychologists, social workers, psychiatric nurses, or counselors? (Do not include visits to a hospital emergency room or visits that occurred while you were an overnight patient in a hospital or other healthcare facility.)

WRITE IN THE NUMBER OF VISITS:

IF NONE, WRITE IN 00 AND SKIP Q20 THROUGH Q27

20. What kind of mental health specialist did you see?

(Circle All That Apply)

- Psychiatrist 1
- Psychologist 2
- Social Worker 3
- Psychiatric Nurse 4
- Counselor 5
- Other 6
- Don't know 7

21. Were any of these visits to mental health specialists who were not covered by your regular health plan?

(Circle One)

- Yes1
- No.....2

22. In the past 6 months, were the costs for your visits with mental health specialists covered by health insurance, paid for entirely out-of-pocket by you or partly paid by insurance?

(Circle One)

- Completely covered by health insurance1 ► GO TO Q24
- Paid for entirely out-of-pocket.....2
- Partly covered by health insurance3

23. Roughly how much did you have to pay in total for these visits during the past 6 months?

WRITE IN THE AMOUNT: \$

(WRITE IN 00000 IF NONE)

24. How many of these visits included counseling for yourself only?

WRITE IN NUMBER OF VISITS:

25. How many of these visits included counseling with other patients in a group?

WRITE IN NUMBER OF VISITS:

26. How many of these visits included counseling with other members of your family or your partner?

WRITE IN THE NUMBER OF VISITS:

27. If you received counselling from a mental health specialist, how much did the specialist who provided the counselling do any of the following?

(Circle One Number On Each Line)

	A Lot	Some	A Little	Not At All	Did not get Counselling
a. Encouraged you to do more of the things you enjoy	1	2	3	4	5
b. Helped you solve problems in your life	1	2	3	4	5
c. Helped you reduce or let go of thoughts that keep you down	1	2	3	4	5
d. Helped you feel better about your life as it is	1	2	3	4	5
e. Told you about his or her own personal problems	1	2	3	4	5

The Patient Assessment Questionnaire was developed at the RAND Corporation in conjunction with the Partners in Care Study.

Family Emotional Involvement and Criticism Scale

DESCRIBE YOUR FAMILY:

	Almost Never 1	Once in a While 2	Sometimes 3	Often 4	Almost Always 5
1. _____					
I am upset if anyone else in my family is upset.					
2. _____					
My family approves of most everything I do.					
3. _____					
My family knows what I am feeling most of the time.					
4. _____					
My family finds fault with my friends.					
5. _____					
Family members give me money when I need it.					
6. _____					
My family complains about the way I handle money.					
7. _____					
My family knows what I am thinking before I tell them.					
8. _____					
My family approves of my friends.					
9. _____					
I often know what my family members are thinking before they tell me.					
10. _____					
My family complains about what I do for fun.					
11. _____					
If I am upset, people in my family get upset too.					
12. _____					
My family is always trying to get me to change.					
13. _____					
If I have no way of getting somewhere my family will take me.					
14. _____					
I have to be careful what I do or my family will put me down.					

Revised Dyadic Adjustment Scale

Most persons have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and your partner for each item on the following list.

	Always agree	Almost always agree	Occasion- ally agree	Frequently disagree	Almost always disagree	Always disagree
1. Religious matters	_____	_____	_____	_____	_____	_____
2. Demonstration of affection	_____	_____	_____	_____	_____	_____
3. Making major decisions	_____	_____	_____	_____	_____	_____
4. Sex relations	_____	_____	_____	_____	_____	_____
5. Conventuality (correct or proper behavior)	_____	_____	_____	_____	_____	_____
6. Career decisions	_____	_____	_____	_____	_____	_____

	All the time	Most of the time	More often than not	Occasionally	Rarely	Never
7. How often do you discuss or have you considered divorce, separation, or terminating your relationship?	_____	_____	_____	_____	_____	_____
8. How often do you and your partner quarrel?	_____	_____	_____	_____	_____	_____
9. Do you ever regret that you married (or live together)?	_____	_____	_____	_____	_____	_____
10. How often do you and your mate "get on each others nerves"?	_____	_____	_____	_____	_____	_____

	Every day	Almost every day	Occasionally	Rarely	Never
11. Do you and you mate engage in outside interests together?	_____	_____	_____	_____	_____

How often would you say the following occur between you and your mate?

	Never	Less than once a month	Once or twice a month	Once or twice a week	Once a day	More often
12. Have a stimulating exchange of ideas.	_____	_____	_____	_____	_____	_____
13. Work together on a project.	_____	_____	_____	_____	_____	_____
14. Calmly discuss something.	_____	_____	_____	_____	_____	_____

Family Assessment Device

Attached are some statements about families. Please read each statement carefully to see how well it describes your own family. You may feel that some of the statements are true for some family members and false for others. Please answer according to your best impression overall.

Each statement has four possible responses:

Strongly Agree (SA)

You feel that the statement describes your family very accurately.

Agree (A)

You feel that the statement describes your family for the most part.

Disagree (D)

You feel that the statement does not describe you family for the most part.

Strongly Disagree (SD)

You feel that the statement does not describe your family at all.

Try not to spend too much time thinking about each statement, but respond as quickly and as honestly as you can. If you have trouble with any statement, answer with your first reaction.

Remember, do not try to figure out how other members see the family. We would like to know what your family seems like to *you*.

Please be sure to answer every statement by placing an “X” or checkmark in the space provided next to each statement.

1. Planning family activities is difficult because we misunderstand each other.	___SA	___A	___D	___SD
2. We resolve most everyday problems around the house.	___SA	___A	___D	___SD
3. When someone is upset the others know why.	___SA	___A	___D	___SD
4. When you ask someone to do something, you have to check that they did it.	___SA	___A	___D	___SD
5. If someone is in trouble, the others become too involved.	___SA	___A	___D	___SD
6. In times of crisis we can turn to each other for support.	___SA	___A	___D	___SD
7. We don't know what to do when an emergency comes up.	___SA	___A	___D	___SD
8. We sometimes run out of things that we need.	___SA	___A	___D	___SD
9. We are reluctant to show our affection for each other.	___SA	___A	___D	___SD
10. We make sure members meet their family responsibilities.	___SA	___A	___D	___SD
11. We cannot talk to each other about the sadness we feel.	___SA	___A	___D	___SD
12. We usually act on our decisions regarding problems.	___SA	___A	___D	___SD
13. You only get the interest of others when something is important to them.	___SA	___A	___D	___SD
14. You can't tell how a person is feeling from what they are saying.	___SA	___A	___D	___SD

15. Family tasks don't get spread around enough.	___SA	___A	___D	___SD
16. Individuals are accepted for what they are.	___SA	___A	___D	___SD
17. You can easily get away with breaking the rules.	___SA	___A	___D	___SD
18. People come right out and say things instead of hinting at them.	___SA	___A	___D	___SD
19. Some of us just don't respond emotionally.	___SA	___A	___D	___SD
20. We know what to do in an emergency.	___SA	___A	___D	___SD
21. We avoid discussing our fears and concerns.	___SA	___A	___D	___SD
22. It is difficult to talk to each other about tender feelings.	___SA	___A	___D	___SD
23. We have trouble meeting out bills.	___SA	___A	___D	___SD
24. After our family tries to solve a problem, we usually discuss whether it worked or not.	___SA	___A	___D	___SD
25. We are too self-centered.	___SA	___A	___D	___SD
26. We can express feeling to each other.	___SA	___A	___D	___SD
27. We have no clear expectations about toilet habits.	___SA	___A	___D	___SD
28. We do not show our love for each other.	___SA	___A	___D	___SD
29. We talk to people directly rather than through go-betweens.	___SA	___A	___D	___SD
30. Each of us has particular duties and responsibilities.	___SA	___A	___D	___SD
31. There are lots of bad feelings in the family.	___SA	___A	___D	___SD
32. We have rules about hitting people.	___SA	___A	___D	___SD
33. We get involved with each other only when something interests us.	___SA	___A	___D	___SD
34. There's little time to explore personal interests.	___SA	___A	___D	___SD
35. We often don't say what we mean.	___SA	___A	___D	___SD
36. We feel accepted for what we are.	___SA	___A	___D	___SD
37. We show interest in each other when we can get something out of it personally.	___SA	___A	___D	___SD
38. We resolve most emotional upsets that come up.	___SA	___A	___D	___SD
39. Tenderness takes second place to other things in our family.	___SA	___A	___D	___SD

40. We discuss who is to do household jobs.	SA	A	D	SD
41. Making decisions is a problem for our family.	SA	A	D	SD
42. Our family shows interest in each other only when they can get something out of it.	SA	A	D	SD
43. We are frank with each other.	SA	A	D	SD
44. We don't hold to any rules or standards.	SA	A	D	SD
45. If people are asked to do something, they need reminding.	SA	A	D	SD
46. We are able to make decisions about how to solve problems.	SA	A	D	SD
47. If the rules are broken, we don't know what to expect.	SA	A	D	SD
48. Anything goes in our family.	SA	A	D	SD
49. We express tenderness.	SA	A	D	SD
50. We confront problems involving feelings.	SA	A	D	SD
51. We don't get along well together.	SA	A	D	SD
52. We don't talk to each other when we are angry.	SA	A	D	SD
53. We are generally dissatisfied with the family duties assigned to us.	SA	A	D	SD
54. Even though we mean well, we intrude too much into each others lives.	SA	A	D	SD
55. There are rules about dangerous situations.	SA	A	D	SD
56. We confide in each other.	SA	A	D	SD
57. We cry openly.	SA	A	D	SD
58. We don't have reasonable transportation.	SA	A	D	SD
59. When we don't like what someone has done, we tell them.	SA	A	D	SD
60. We try to think of different ways to solve problems.	SA	A	D	SD

Brief Symptom Inventory

Sample items:

(Questions refer to symptoms experienced during the last seven days.)

0 1 2 3 4
 Not at All (NA) slightly (s) moderately (m) quite a bit (q) Extremely (E)

	<u>NA</u>	<u>s</u>	<u>m</u>	<u>q</u>	<u>E</u>
1. Nervousness or shakiness inside	0	1	2	3	4
13. Temper outbursts that you could not control	0	1	2	3	4
38. Feeling tense or keyed up	0	1	2	3	4

Appendix B

Consent to Be a Research Subject

The purpose of this research study is to determine how marriage and family therapy affects general health care use. D. Russell Crane, a professor of marriage and family therapy, at Brigham Young University, is conducting this study. You were selected for participation because you indicated a willingness to be contacted about participating in research when you began receiving services at the Brigham Young University Comprehensive Clinic.

As part of your participation, you will be asked to arrive for your first appointment with this packet of information filled out. The measures and forms ask for information about marital, family, and individual functioning, as well as medical use. These forms require about forty-five minutes to complete.

Though there are minimal risks for participation in this study, there is the potential for discomfort associated with providing information of a personal and sensitive nature. While there are no known benefits to you for participating in this study, society and people in general will likely benefit from the knowledge gained regarding how marriage and family therapy can influence general medical use.

Participation in this research is voluntary. You have the right to refuse to participate and the right to withdraw later without any jeopardy to the quality of health care received. Strict confidentiality will be maintained. No individual identifying information will be disclosed. Where possible, all identifying references will be removed and replaced by control numbers. All data collected in this research study will be stored in a secure area and access will be given only to personnel associated with the study.

For participating in this study you will be paid \$5.00 (enclosed) for simply reviewing these materials and an additional \$30 when the packet is returned. In addition, you will be paid another \$35.00 for completing the packet again at a follow-up of six months after therapy has ended. If you choose not to participate in the study, you are free to keep the enclosed \$5.00.

Regardless of compensation paid, you have the right to withdraw from the study or refuse to participate. Your decision will in no way affect the services you receive at the Comprehensive Clinic.

If you have any questions regarding this research project, you may contact D. Russell Crane by mailing questions to 274 Taylor Building, Brigham Young University, Provo, UT, or by calling (801) 422-5623. If you have questions regarding your rights as a participant in a research project, you may contact Dr. Shane S. Schulthies, Chair of the Institutional Review Board, 120B RB, Brigham Young University, Provo, Utah 84602; phone, (801) 422-5490.

I have read, understood, and received a copy of the above consent, and desire of my own free will and volition, to participate in this study.

Research subject _____

Date _____

Table 1

Summary statistics for the variables within each of the four components

Component and variable	M (SD) or % of sample	Range	Correlation coefficient with medical use
Demographics			
Age ^a	30.60 (9.10)	19 - 68	-.024
Gender (% male) ^a	43.33%	N/A	.241
Race (% White) ^a	95.00%	N/A	.026
Income (% above \$30,000) ^a	41.67%	N/A	.056
Education (% college degree) ^a	51.67%	N/A	.049
Marital status (% married) ^a	95.00%	N/A	.072
Social functioning			
Stressful events ^b	4.70 (2.51)	1 - 14	-.145
Total coping ^b	21.11 (3.72)	13 - 29	-.003
Global Stress ^b	3.92 (0.85)	1 - 5	-.080
Total social support ^b	32.77 (8.12)	13 - 45	.325*
Negative social exchange ^b	9.68 (3.73)	4 - 20	-.186
Mental health			
Somatization ^c	0.60 (0.68)	0.00 - 3.43	.240
Depression ^c	1.37 (0.89)	0.00 - 3.33	-.012
Anxiety ^c	1.13 (0.90)	0.00 - 3.50	.278*

Hostility ^c	1.11 (0.76)	0.20 - 3.40	.268*
Positive symptom total ^c	29.27 (11.21)	4 - 46	.236
Life satisfaction ^b	11.75 (1.87)	7 - 15	.085
Relationship functioning			
Perceived criticism ^d	14.23 (5.49)	7 - 32	-.304*
Emotional involvement ^d	21.72 (4.23)	12 - 30	-.088
General family functioning ^e	2.16 (0.52)	1.00 - 3.42	-.250
Behavior control ^e	1.92 (0.40)	1.11 - 2.89	-.100
Dyadic distress ^f	58.33%	N/A	.097
Dependent variable			
Medical use (# of visits) ^g	2.42 (2.84)	0 - 12	--

a-Demographic Questionnaire, b-Multidimensional Health Profile-Psychosocial

Functioning, c-Brief Symptom Inventory, d-Family Emotional Involvement and Criticism Scale, e-Family Assessment Device, f-Revised Dyadic Adjustment Scale, g-Patient Assessment Questionnaire.

* $p < .05$

Note: Raw scores were used to calculate the mean (or %) and standard deviation. Values resulting from transformation were used in the calculation of the correlation coefficient with medical use. The square root transformation was used with number of stressors, somatization, anxiety, and hostility. The exponential transformation was used with global stress and the logarithmic transformation was used with age, negative social exchange, and perceived criticism. Race and marital status were converted into dichotomous variables.

Table 2

Results from the within-component multiple regression analyses with the standardized coefficient and the amount of variance for each variable

Component and variable	Standardized coefficient	Partial R^2
Demographics		
Gender	.241	.058 [†]
Social functioning		
Stressful events (square root)	-.150	.025
Total social support	.327	.110*
Mental health		
Depression	-.444	.097*
Anxiety (square root)	.345	.061 [†]
Hostility (square root)	.278	.058 [†]
Positive symptom total	.265	.021
Life satisfaction	.265	.065 [†]
Relationship functioning		
Perceived criticism (log)	-.197	.032
Emotional involvement	-.173	.027
General family functioning	-.228	.037 [†]

* $p < .05$

[†] $p < .15$

Table 3

Results from the full model multiple regression analysis with the standardized coefficient and the amount of variance for each variable

Variable	Standardized coefficient	Partial R^2
Total social support	.223	.055
Depression	-.265	.046
Anxiety (square root)	.360	.086*
Hostility (square root)	.349	.108*
Life satisfaction	.212	.043

* $p < .05$