

# Problem-Solving Counselling or Phone-Call Support for Outpatients with Chronic Illness: Effective for Whom?

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L'objectif de cet essai contrôlé avec répartition aléatoire des sujets était de déterminer dans quelle mesure les conseils pour la résolution de problèmes ou le soutien au téléphone qu'apportent les infirmières aux malades externes atteints de maladie chronique et mal adaptés à celle-ci sont efficaces. On a étudié 293 sujets une première fois, puis après une période d'intervention de six mois, pour examiner les variables psychosociales comme les comportements opérants, les buts dans la vie et l'adaptation psychosociale à la maladie. Les personnes que les infirmières ont soutenu au téléphone ont vu leur niveau de détresse psychologique diminuer. Cette étude a révélé que les conseils pour la résolution de problèmes augmentent l'adaptation psychosociale à la maladie chronique pour les malades externes qui vivent seuls, qui utilisent rarement leurs talents cognitifs d'adaptation ou pour résoudre les problèmes, ou qui emploient fréquemment des méthodes d'évitement. D'autre part, les personnes qui attendent peu de la vie et qui emploient rarement leurs talents d'adaptation à la résolution de problèmes ont le plus profité des conseils pour la résolution de problèmes que leur ont prodigués les infirmières. En dernier lieu, les personnes mal adaptées mais qui utilisent souvent leurs talents d'adaptation à la résolution de problèmes ont tiré un meilleur profit du soutien au téléphone.

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The purpose of this randomized controlled trial (RCT) was to determine the effectiveness of problem-solving counselling or phone-call support provided by nurses to outpatients not well adjusted to chronic illness. Subjects ( $N=293$ ) completed measures at baseline and after the six-month period of intervention for psychosocial variables including coping behaviours, purpose in life, and psychosocial adjustment to illness. Subjects receiving phone-call support from nurses demonstrated less psychological distress. Results also suggest that problem-solving counselling improves psychosocial adjustment to chronic illness for outpatients who live alone, infrequently use problem-solving coping skills, or frequently use avoidance coping methods. As well, outpatients with a low purpose in life who show infrequent use of problem-solving coping skills appear to benefit most from problem-solving counselling provided by nurses. On the other hand, those not well adjusted who frequently use problem-solving coping seem to be served more effectively by phone-call support.

Psychological adaptation or adjustment among chronically ill outpatients (Davies, Quinlan, McKegney, & Kimball, 1973) is remarkably effective and is fundamentally independent of the patient's specific diagnosis, such as cancer (Cassileth et al., 1984; Cassileth et al., 1985) or renal failure (Livesley, 1982). Poor psychosocial adjustment to a variety of chronic diseases has been associated with life stress and social isolation (Lewis & Bloom, 1978; Ruberman, Weinblatt, Goldberg, & Chaudhary, 1984), as well as unfavourable self-concept, social relationships, and attitudes toward illness (Counte & Bielawskas, 1983; Hyman, 1975). Reduced function in job, household, and leisure roles as well as high rates of "medically illegitimate job disability" (Hyman, 1975) and mortality (Derogatis, Abelloff, & Melisaralos, 1979) have been observed among those not well adjusted to their illness.

Psychosocial adjustment is thought to be a quality-of-life measure of how individuals are dealing with the stresses of their illness. Social and cognitive variables explain between 27 and 57 percent of the variation in psychosocial adjustment to chronic illness (Broadhead et al., 1983; Evans & Northwood, 1983; Lazarus & Folkman, 1984; McFarlane, Norman, Streiner, & Roy, 1983; Moos, Cronkite, Billings, & Finney, 1984). Psychosocial adjustment is related to a combination of cognitive, coping, and perceived social support variables. Consequently, nursing interventions for outpatients with chronic illness should be designed to either promote more effective cognitions and coping behaviours or provide more social support. One or both of these types of interventions should improve psychosocial adjustment to illness, given that social support and cognition are inextricably bound. Thus, interactions between interventions, cognitions, coping behaviours, and social support need to be examined, to determine who benefits from different strategies (Browne, Byrne, Roberts, & Sword, 1994).

## **Background Literature**

### ***Problem-Solving Counselling***

Problem-solving intervention is located within the literature on cognitive-behaviour therapy (Mahoney & Arnkoff, 1978). Cognitive-behaviour therapy is a broad term referring to psychological treatments that primarily emphasize the role cognitions play in explaining behaviour, as in the work of Ellis (1969) and Beck, Rush, Shaw, and Emery (1979). The coping framework of Lazarus and Folkman (1984) emphasizes the role of coping in explaining outcome, as does the theoretical work of Moos and Billings (1982). Problem-solving therapy combines cognition and coping in a naturally occurring problem-solving process, and is described in the work of D'Zurilla (1986), D'Zurilla and Goldfried (1971), D'Zurilla and Nezu (1982), Meichenbaum (1985), and Meichenbaum and Turk (1987). It is a type of cognitive-behaviour therapy.

Major reviews of counselling approaches have consistently documented the effectiveness of a brief (eight- to 10-session) cognitive-behaviour approach to treatment (D'Zurilla, 1986; D'Zurilla & Nezu, 1982; Elkin, Parloff, Hadley, & Autry, 1985; Hollon & Kendall, 1979; Mahoney & Arnkoff, 1978; Turk, Meichenbaum, & Genest, 1983). The cognitive-behaviour approach to therapy, which has been carefully described, emphasizes the role of thoughts or cognitive appraisals, self-control, coping, and problem-solving skills as crucial variables producing therapeutic change (Beck et al., 1979; Cameron & Meichenbaum, 1982; D'Zurilla, 1986; D'Zurilla & Nezu, 1982; Hollon & Kendall, 1989; Meichenbaum, 1985; Turk et al., 1983). However, in general, most studies of cognitive-behaviour therapy have been done on subjects with mental health problems such as depression (Beck et al., 1985; Elkin et al., 1985; Williams, 1984). Only a few studies with control groups have tested the effectiveness of cognitive-behaviour therapy for patients with chronic physical illnesses such as headache (Attanasio, 1987; Blanchard et al., 1985) or epilepsy (Tan & Bruni, 1986). The significant reduction in symptoms was associated with all groups including the group with less therapist contact (Attanasio, 1987). The cognitive component of the treatment appears to be the critical feature associated with longer lasting, more generalized effects (Attanasio, 1987; Bandura, 1977; Hollon & Kendall, 1979; Tan & Bruni, 1986).

In summary, cognitive-behaviour therapy and problem-solving therapy have been specifically tested in outcome studies with hospitalized psychiatric patients, substance abusers, depressed geriatric patients, and couples with marital problems (Coché & Flick, 1975; Hussain & Lawrence, 1981; Intagliatia, 1978; Jacobson, 1978). These studies have produced promising results but conclusions to date have been weakened by inadequate attention to control groups or procedures, inadequate outcome measures, and lack of follow-up evaluations to assess duration of effects.

### *Phone-Call Support*

Instrumental or social support for chronically ill outpatients has been advocated as a method to improve coping and psychosocial adjustment to illness by Broadhead et al. (1983), who hypothesize that perceived supportiveness has a role in fostering positive health outcomes. We found no randomized control trials (RCT) examining the effectiveness of face-to-face versus over-the-phone counselling, in the published literature on psychosocial adjustment to chronic physical illness. Although their study was methodologically flawed since baseline characteristics were not comparable between experimental and control groups, Frasure-Smith and Prince (1989) found fewer deaths in a post-myocardial infarction group that received a combination of phone-call support and nurse visits than in a control group. Infante-Rivard, Krieger, Petitcherc, and Baumgarten (1988) found that elderly people used fewer medical services after hospital discharge when they received phone follow-up although their results did not reach statistical significance. In Wasson et al.'s (1992) trial, clinician-initiated phone care appeared to significantly reduce use of medical services. For the severely ill, this phone contact also appeared to improve health status and reduce mortality; however, psychosocial adjustment was not addressed in this study.

Emotional support was found to be the most common category of need in a phone-in line for people with arthritis (Masiak, Kaplan, & Heck, 1989). Such perceived support may be the common therapeutic mechanism during periods of high vulnerability to stress (Frasure-Smith & Prince, 1989). Nevertheless, numerous studies have identified the need to examine long-term effects of chronic illness and possible supportive interventions (Blakely et al., 1991; Bombardier, D'Armico, & Jordan, 1990; Braden, 1990; Buckley, Vacek, & Cooper, 1990; Burckhardt, Woods, Schultz, & Ziebarith, 1989; Drory & Florian, 1991; Jensen & Kroly, 1991; Jensen, Turner, & Romano, 1991; Pollock, Christian, &



Sands, 1990; Primomo, Yates, & Woods, 1990). Thus, study results of problem-solving therapy and phone-call support hold promise, while research using stringent methodological criteria is needed.

The purpose of this RCT was to determine the effectiveness of problem-solving counselling or phone-call support in improving psychosocial adjustment to illness, using a control group for comparison.

The following research questions were posed: Does the addition of problem-solving counselling (Group 1) or a phone-call support strategy (Group 2), both designed to augment conventional clinic health care, enhance patients' psychosocial adjustment to chronic illness, as compared with conventional clinic health care alone (Group 3)? What are the coping, socio-demographic, and purpose-in-life characteristics of patients for whom these interventions are effective?

## **Method**

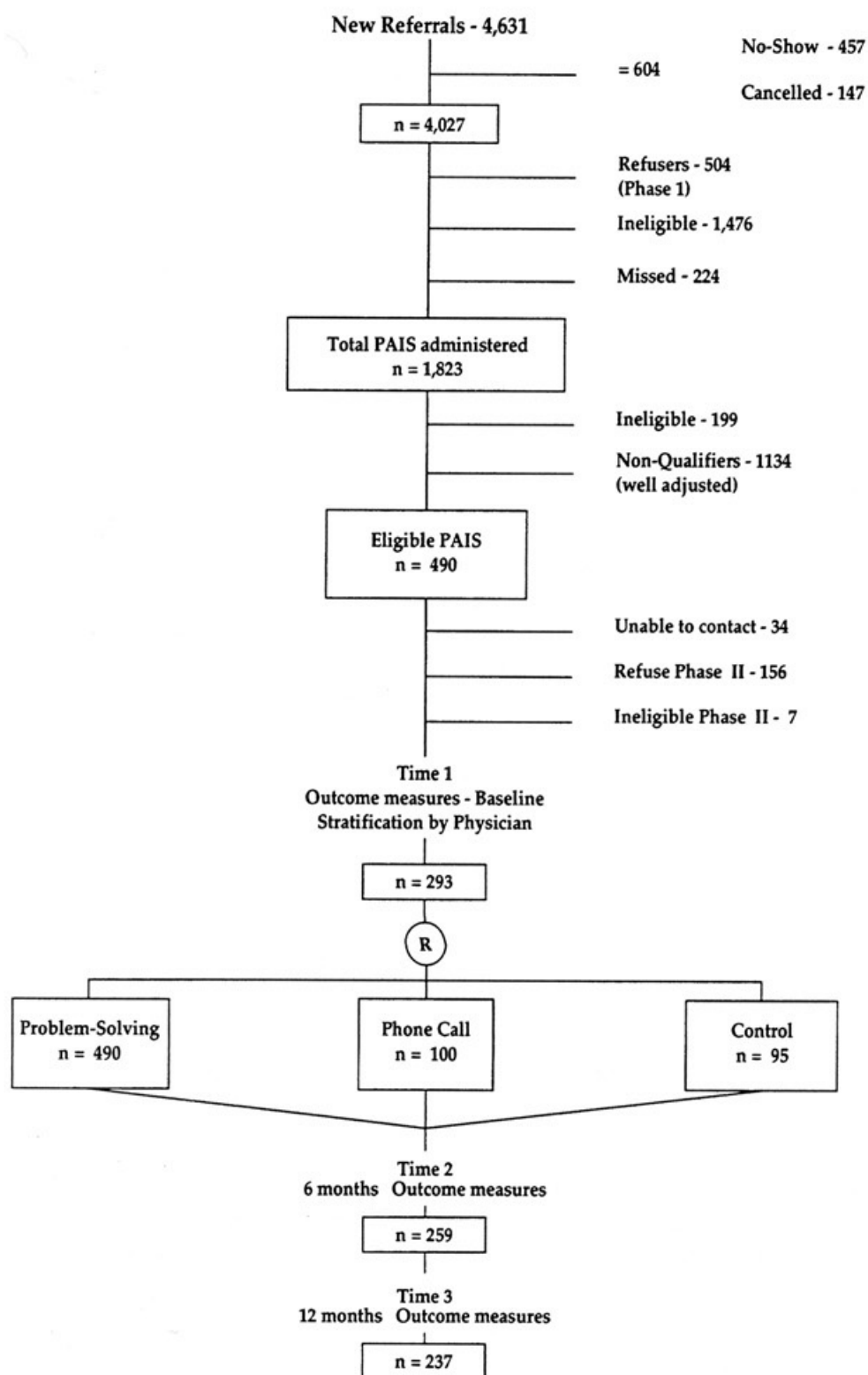
### ***Design and Setting***

This RCT was carried out in 27 outpatient specialty clinics of a southern Ontario hospital. These clinics, in a large urban tertiary care centre, serve as referral points for a broad spectrum of general disorders. The nine major clinic groupings screened were: endocrinology, internal medicine, respirology, dermatology, cardiology, occupational health, gastroenterology, neurology, and rheumatology. Subjects were stratified by physician and randomly assigned blocking after every six subjects.

### ***Sample***

Subjects were new adult referrals to physicians at the clinics participating in the study. Each had a chronic medical disorder that required ongoing medical evaluation for more than one year. These disorders included: hypertension, diabetes and other endocrine disorders, chronic lung disease, asthma, epilepsy, Parkinson's disease, Crohn's disease, ulcerative colitis, scleroderma, angina, and arthritis. Preliminary eligibility criteria were that subjects be 18 years or older and able to read, write, and understand English, and that they consent to complete the Psychosocial Adjustment to Illness Self-Report form (PAIS-SR) questionnaire. Subjects who scored low on psychosocial adjustment were subsequently asked if they would be willing to be randomly assigned visits, or phone calls, or neither from a nurse to talk about how they were coping with their illness.

**Figure 1** Trial Flow Chart



## **Procedures**

All subjects with chronic illness referred to the outpatient clinics ( $N=4,027$ ) were asked for informed consent and then approached to complete the screening PAIS questionnaire. If the PAIS score indicated fair-to-poor adjustment ( $>34$  for the total score or score  $>9$  on the psychological distress subscale), indicating that the subject was not adjusting well to illness (Derogatis & Lopez, 1983), the subject was asked for additional consent, Baseline measures were taken, and the subject was randomized to one of three arms of the trial: problem-solving individualized counselling (Group 1), phone-call support (Group 2), or conventional medical care alone (Group 3). Of those screened ( $n=1,823$ ), 490 eligible, not well-adjusted subjects were selected for the trial. Some 156 refused, 34 were not located, and seven were unable to participate. Thus 293 entered the trial (Figure 1). Baseline and two follow-up measurements were done at six and 12 months after patients entered the study. Baseline measures were done only after the subject had agreed to randomization. This helped ensure fewer differences in types of subjects in groups since all three groups of subjects agreed to receive counselling if so randomized. It was thought that in order to test if the therapy was effective, it should last six months. After the six months of intervention 9-13% of subjects were lost from each group, and another 6-9% were lost to the 12-month follow-up. Thus 81% of those originally randomized completed the final outcome measurements at one year after enrolment.

**Nurse assignment.** Nurses were master's-prepared, experienced counsellors who were educated in problem-solving intervention with meetings and workshops and had copies and the use of a Problem Solving Therapy Manual (Meichenbaum, 1992). Throughout the study, weekly group sessions, with all four nurses present as well as two senior nurse investigators, were used to generate and verify formulations about patient's circumstances and about goals and strategies for care. Through these group discussions and by review of nurses' notes, two investigators verified that the interventions were being carried out according to the protocol.

Phone calls were observed for timing and verbal responses by the nurses. Nurses' notes were monitored for content by another investigator and by the research associate. The study nurses kept notes on topics discussed and length of time of each phone call. Nurses provided only supportive comments during the phone calls made to Group 2 subjects and a sample of the comments during calls was verified by the research associate.

The same group of nurses provided both the problem-solving intervention, one to 10 hours of arranged individual meetings (Group 1), and the one to eight five-minute phone calls to subjects in order to avoid the bias associated with the personality of the therapist. Subjects were randomly assigned to counselling or phone-call support. Nurses were assigned to one or two clinics and assigned subjects based on case load. Each intervention followed a script. Each nurse who met or phoned her subjects over a six-month period kept notes of all sessions. The family physicians of all subjects were notified of the patient's participation in the trial but not of the patient's group assignment.

### *Study Groups*

*Problem-solving counselling sessions (Group 1).* The problem-solving sessions were added to conventional outpatient clinic care for patients ( $n=98$ ) allocated to Group 1. The Model of Problem Solving Therapy for Adults (D'Zurilla, 1986; D'Zurilla & Nezu, 1982), which updates D'Zurilla and Goldfried's (1971) widely used Model of Problem Solving, is recommended by Meichenbaum (1985, 1987). The model consists of stages during a sequence of sessions designed to meet the following goals: (a) Problem Orientation: to nurture identification and recognition of problems, as well as strengths, thus fostering a shift from negative emotions and thoughts (e.g., feelings of helplessness, hopelessness, and demoralization) that hinder problem-solving to a positive sense of resourcefulness; (b) Problem Definition and Formulation: to help identify realistic goals or desired outcomes for problem-solving; (c) Generation of Alternatives: to help generate and evaluate a wide range of alternative courses of action (both direct coping efforts for aspects that can be changed and emotionally palliative coping efforts for aspects that cannot) while developing and using social supports; (d) Decision-Making: to help evaluate the possible consequences of available alternative solutions and select the most effective and feasible ones for the short and long term, personally and socially; (e) Solution Implementation, Verification, and Relapse Prevention: to help assess the efficacy or outcome of the chosen solutions, take credit for changes, identify high-risk situations, and handle relapses or setbacks (Meichenbaum, 1992).

While effective problem-solving seems to follow a temporal sequence, there is interplay among the various stages relating to reappraisal of the problem and of the effectiveness of various solutions (Cameron & Meichenbaum, 1982; Meichenbaum, 1985). Since subjects in this trial did not actively seek this psychosocial help for their prob-



lems, in living with their illness or otherwise, an unobtrusive approach to the initial assessment was warranted. Nurses were taught to open the first meeting with an explanation of the purpose of this study: to learn about how people cope with illness. Then nurses explored symptoms associated with the patient's illness. This exploration included inquiries about physical symptoms, difficulties in daily living, and problematic emotions, their own and those of others, resulting from the illness and affecting their daily life.

During the one- or two-session problem-solving inquiry, the nurse observed thematic areas of deficiency in problem-solving that pervade multiple contexts (symptoms, emotions, illness, daily living related to family, job). The nurse formulated these observations and negotiated with the patient until agreement was reached regarding the central or underlying issue in appraisal, coping behaviour, or other steps of problem-solving. Then, goals regarding appraisal, problem-solving, or coping behaviour were set and prioritized. Behavioural tasks for goal accomplishment were arranged and follow-up sessions were scheduled to evaluate progress. The number and spacing of meetings were tailored to individual needs.

Of 98 subjects randomized to receive therapeutic problem-solving therapy, 96 had at least one hour-long visit with the research nurse. Twenty-four visits with subjects included another family member. Subjects were rated according to their goal-attainment (problem-solving) ability by their nurse counsellor. Of the 96 subjects, 5% were deemed to be worse off after the problem-solving therapy, and 28% showed no improvement; however, 44% and 23% showed some or great improvement in meeting their mutually identified goals. The most frequently identified concerns or goals expressed related to family or significant others. Ten sessions were planned for each individual, but nurses and subjects sometimes agreed to fewer or, infrequently, more sessions. The number of sessions ranged from one to 14. The mean number of sessions was 4.6 and the mean number of minutes per session was 64. On the whole, 89% of the subjects completed two or more sessions. Those dropping out before Time 2 (six-month measures) had an average of 3.5 sessions.

**Phone-call support (Group 2).** Nurses from the same pool contacted patients in Group 2 ( $n=100$ ) by telephone using a standardized contact sequence: every two weeks for two months, then once a month for four months, for a total of one to eight brief, five-minute phone calls. The subject and the nurse mutually agreed on the total number of calls. Each call started with the question "How are you doing?" The nurses

were instructed to actively listen without probing, offering supportive and encouraging comments. Nurses were instructed not to use problem-solving techniques and were provided with scripts for supportive care only. When discussing health concerns, the nurses asked the subject what they would normally do, and supported the response, if appropriate. This was considered to be a supportive intervention that did not require subjects to learn and practise problem-solving techniques.

Only three subjects in Group 2 received fewer than two phone calls. Summary sheets of phone calls classified issues or concerns raised by the patient. These issues and concerns were recorded using the coding system adapted from Stam, Blutz, and Pittman (1986). Those mentioned most often by the subjects during calls related to treatment or physical-somatic complaints. Subjects received an average of 5.06 calls lasting an average of 6.83 minutes per call. On average, 2.30 calls for each subject were missed after three attempts, usually because the subject could not be reached at the pre-arranged time.

*Conventional clinic care (Group 3).* Subjects ( $n=95$ ) randomized to this group received no supportive phone calls and had no problem-solving sessions with the research nurses. These subjects continued with their conventional clinic care as deemed appropriate by their attending physicians.

### Measures

Self-report questionnaires were mailed to the subjects and returned to the research office (also by mail). Personal information collected included age, sex, marital status, whether living alone, whether Canadian-born, level of education, and employment status. Outpatient clinic charts were consulted for time elapsed since diagnosis, and for primary diagnosis which was coded according to the classification codes of the Royal College of General Practitioners (1984).

Psychosocial adjustment to illness (PAIS-SR) was the outcome of primary interest in this study. Weissman's (1981) review of instruments measuring psychosocial adjustment cited the PAIS as the only appropriate measure for a physically disadvantaged group. Morrow, Chiarello, and Derogatis (1978) and Derogatis and Lopez (1983) developed the PAIS-SR to measure psychosocial adjustment, including intrapsychic processes, as well as interactions between the individual and other people and institutions in their sociocultural environment. Derogatis and Lopez (1983) report an internal consistency ( $\alpha=.81$ ) and

interrater reliability ( $r=.86$ ), as well as good construct validity. This 46-item self-report assesses adjustment to a current medical illness in seven domains (health-care orientation, vocational environment, domestic environment, sexual relationships, extended family relationship, social relationships, and psychological distress). Each item is rated on a four-point scale, with a raw score of 35 to 51 representing fair adjustment to illness and greater than 51 representing poor adjustment (Arpin, Fitch, Browne, & Corey, 1990; Browne, Arpin, Corey, Fitch, & Gafni, 1990; Derogatis & Lopez, 1983).

The Eastern Co-operative Oncology Group (ECOG) Performance Status Scale is a subjective assessment of how an illness affects ability to function (Skeel, 1982). This simplified version of the Karnofsky Performance Status Scale (KPS) (Karnofsky, Abelman, Craser, & Birchenal, 1948) has five levels of functioning, to provide a global rating of physical performance status or activity level. The scale was used to enable comparison of the treatment and control groups on physical performance. The rating "1" indicates "fully active," while "5" indicates inactivity. Formal reports of reliability and validity were not found.

Coping was measured using the Indices of Coping Response (Moos et al., 1984), an instrument that focuses on cognitive and behavioural coping responses following a stressful event. Different coping behaviours are thought to mediate a stressor such as a physical illness. Respondents rate their frequency of use of 33 different coping responses on four-point scales. Responses are categorized into three methods of coping: active cognitive, active behavioural, and avoidance; and five foci of coping: problem-solving, logical analysis, emotional discharge, affective regulation, and information-seeking. Previous reports of internal consistency ( $\alpha=.51$  to  $.74$ ) and satisfactory construct validity are Moos and Billings (1982) and Moos et al. (1984). In our study sample, internal consistency was fair to good for the subscales (Cronbach's  $\alpha=.69, .75, .43, .57, .59, .58, .58, .44$ ).

The 33-item Meaning of Illness questionnaire (Browne et al., 1988) uses seven-point items to measure whether the respondent has a positive or negative view of various aspects of the illness, such as severity, expectedness, controllability, hopelessness, uncertainty, and the degree to which the illness event interferes with commitments (Haan, 1982). Test-retest reliability was given as  $.60$  to  $.77$  (Arpin et al., 1990) and internal consistency was good (Cronbach's  $\alpha=.73, .75, .70, .60, .40$ ) in the five subscales for our study sample. It was thought that meaning given to illness was an important protective resource used when facing a stressor such as physical illness.

The Purpose-in-Life questionnaire is an attitude scale constructed from the orientation of logotherapy, a system of Frankl's (1965, 1969) existential therapy. It quantifies one's primary motivation to find meaning and purpose in human existence. If one fails to find sufficient meaning and purpose to give one's life a sense of unique identity, "existential vacuum" is experienced. This is a 20-item questionnaire on a seven-point scale. A total score under 92 indicates a definite lack of purpose in life, a score of 92-112 indicates indecisiveness, and over 112 indicates a clear sense of purpose. Split half reliability ( $r=.81$ ), test-retest reliability (.68-.83), and criterion validity (.38-.47) have been reported (Crumbaugh, 1969). Our study sample yielded good internal consistency (Cronbach's  $\alpha=.92$ ).

Social supports have been shown to have both buffering and direct beneficial effects on diverse health-related outcomes, including use of health care services, general morbidity, and a variety of psychologic states (Broadhead et al., 1988). The Duke social-support questionnaire measures functional elements of social supports using two factors, a five-item confidant support and a three-item affective support. Confidant support reflects primarily a confidant relationship in which important matters in life are discussed and shared. Affective support reflects a more emotional form of support or caring. Test-retest reliability was reported as .66 (Broadhead, Gehlback, deGruy, & Kaplan, 1988). In our sample, internal consistency was good for the two subscales (Cronbach's  $\alpha=.82$  and .79) and a factor analysis with our dataset yielded the same two factors with eigenvalues of 4.0 and 1.1.

The clinicians' (clinic physician or nurse) subjective judgement of disease severity was recorded on a seven-point scale to provide a global measure applicable across types of disease. A rating of "1" indicated not severe, "7" very severe. It was considered neither reliable nor necessarily valid, however, since a broad measure of severity for a diverse range of chronic illnesses was needed, it was included in the study.

A measure of perceived change in life and health (developed by two of the investigators) was given immediately after the intervention in Groups 1 and 2. Subjects were asked to complete a four-item scale measuring their change from six months previously, in (a) satisfaction with life, (b) life overall, (c) state of health, and (d) coping and adjustment to health. Questions were scored from 1 to 7 (much worse to much better). Validity of this questionnaire was evaluated by examining correlations with PAIS scores ( $r=.43$  to .44). Subjects in Group 1 and Group 2 were also asked to indicate whether the nursing intervention they received was helpful, not helpful, or neither.



## **Analysis**

Subject representativeness and group comparability at Baseline were assessed using analysis of variance (ANOVA) and chi-square statistical tests. The effectiveness of interventions was evaluated using repeated-measures ANOVA for the Baseline, six-month follow-up, and 12-month follow-up. Since interactions for time were significant, change scores in psychosocial adjustment from Baseline to Time 2 (when the intervention occurred) were used in analysis of variance when examining interactions in more detail.

## **Results**

### ***Representativeness***

Of 4,027 clinic attendees (Figure 1), 504 refused to participate in the study screening and 224 were missed by screeners; however, most were ineligible ( $n=1,476$ ), because, for example, they did not have a chronic illness ( $n=413$ ). The three groups of participating subjects were similar to the three groups of non-participating subjects (refused, unable to be contacted, and died or too ill) in level of psychosocial adjustment to illness ( $F_{5,484}=.28, p=.92$ ). Dropouts (12% by Time 2; 19% by Time 3) were compared with those remaining in the study. At Time 2, dropouts were comparable except they were younger on average (47 vs. 39 years). By Time 3, dropouts were younger and had more unanswered questions about health care at Baseline.

### ***Prevalence of Poor Psychosocial Adjustment***

Screened subjects were well (66%), fairly well (20%), or poorly (14%) adjusted. Highest levels of poor adjustment were for subscales: Psychological Distress (feeling angry, sad, depressed) and Health Care Orientation (having many unanswered questions about the illness and its treatment).

### ***Comparability of Study Groups***

Subjects randomized to one of three study groups were comparable in age (44-48 years), education (grades 12-13), time elapsed since diagnosis (six-eight years), moderate severity of illness, sex (30-40% males), employment (48-63% employed), whether Canadian-born (72-78%), level of disability (22-26% fully active), marital status (64-74% married), and living alone (10-18%), and were comparable in the proportions of subjects from each diagnostic grouping. There were no statistically sig-



nificant differences in any sociodemographic or psychosocial Baseline variables of the three study groups. PAIS scores at Baseline were comparable across Groups 1, 2, and 3 ( $F_{2,256}=.34, p=.71$ ).

### *Effectiveness of Interventions*

**Psychosocial main effects.** Table 1 indicates the mean scores on PAIS and PAIS subscales, and compares mean changes from Baseline to Time 2 (when the intervention occurred). The higher the change score, the greater the improvement. There were main-effect differences among groups on the psychological distress subscale of the PAIS ( $F=4.07, p=.02$ ), the phone support group demonstrating the greatest improvement. Single-item global measures also indicated that the two intervention groups experienced greater (a) satisfaction with life ( $\chi^2=21.6, p<.001$ ), (b) improvement in life overall ( $\chi^2=15.3, p<.01$ ), and (c) improved coping and adjustment to health ( $\chi^2=12.2, p<.01$ ). Thus there was a statistically significantly larger proportion of patients satisfied with life overall in the problem-solving counselling (60%) and phone-support (69%) groups versus the control group (40%). In addition, only 3% (Group 1) and 7% (Group 2) rated the interventions as not helpful.

**Analysis of interaction effects: treatment assignment by psychosocial factors.** To determine the effect of counselling and phone-support interventions on the dependent variable psychosocial adjustment to illness, repeated measures ANOVA using theoretically postulated important independent variables such as living alone status and coping factors, and purpose in life were carried out examining the interactive effects of group allocation, intervention, and time (two follow-up measures) on the dependent variable, psychosocial adjustment. Since time of measure interacts with other factors, the latter were examined more fully over one time period, the six months of the intervention using ANOVA with PAIS change scores from Baseline to Time 2 as the dependent variable. Because statistically significant interaction effects were found, statements about effects of treatment are qualified based on interacting variables. Discussions of main effects of treatment are meaningless when interactions are present (Kleinbaum & Kupper, 1978). The presence of interactions indicates that certain characteristics (factors) moderate the treatment effect.

**1. Sociodemographic characteristic interaction.** The interactive effects of the following sociodemographic characteristics, in relation to study group and change in psychosocial adjustment as the dependent variable (Baseline to Time 2), were investigated: age, sex, living status,

**Table 1**

*Comparison of Mean Changes in Outcome Scores among Counselling, Phone-Call Support, and Conventional-Care Groups (Time 1-2) (n=259)*

| Mean Score                | Counselling |        |                |        | Phone-Call |        |                |        | Conventional |        |                |        |      |     |
|---------------------------|-------------|--------|----------------|--------|------------|--------|----------------|--------|--------------|--------|----------------|--------|------|-----|
|                           | Time 1      | Time 2 | $\bar{x}$ Diff | SD     | Time 1     | Time 2 | $\bar{x}$ Diff | SD     | Time 1       | Time 2 | $\bar{x}$ Diff | SD     | F    | P   |
| <b>Total PAIS</b>         | 50.19       | 42.72  | 7.47           | (17.8) | 50.26      | 42.44  | 7.82           | (17.1) | 49.10        | 44.72  | 4.37           | (14.2) | 1.12 | .33 |
| Health-Care Orientation   | 8.41        | 7.54   | .87            | (4.0)  | 8.79       | 7.74   | 1.05           | (3.7)  | 8.28         | 8.45   | -.17           | (3.4)  | 2.63 | .07 |
| Vocational Environment    | 7.22        | 6.29   | .93            | (3.7)  | 7.17       | 6.30   | .87            | (3.7)  | 7.10         | 6.17   | .93            | (3.5)  | .01  | .99 |
| Domestic Environment      | 7.43        | 6.33   | 1.10           | (3.9)  | 7.78       | 6.48   | 1.30           | (3.2)  | 7.73         | 6.73   | 1.00           | (3.3)  | .16  | .85 |
| Sexual Relations          | 5.35        | 4.54   | .81            | (2.8)  | 5.37       | 4.47   | .90            | (3.3)  | 5.46         | 5.17   | .29            | (3.5)  | .88  | .42 |
| Extended Family Relations | 3.11        | 2.66   | .45            | (3.1)  | 2.55       | 2.54   | .01            | (2.6)  | 2.58         | 2.36   | .22            | (2.3)  | .59  | .56 |
| Social Relations          | 8.22        | 6.52   | 1.70           | (4.1)  | 7.54       | 6.52   | 1.02           | (5.1)  | 7.89         | 6.46   | 1.43           | (4.4)  | .48  | .62 |
| Psychological Distress    | 10.46       | 8.84   | 1.62           | (4.9)  | 11.06      | 8.39   | 2.67           | (4.7)  | 10.06        | 9.39   | .67            | (4.0)  | 4.07 | .02 |

education, whether Canadian-born, time elapsed since diagnosis, activity level, and severity of illness. Living status was the only sociodemographic variable to interact with effect of treatment in determining change in psychosocial adjustment. Among those who lived alone, the patients assigned to receive problem-solving counselling showed the greatest improvement in adjustment ( $F_{2,247}=3.2, p=.04$ ).

**2. Coping methods interactions.** Two coping factors, problem-solving coping and avoidance coping, were a priori hypothesized to be characteristics that might predict differences in effectiveness of treatment. Table 2 indicates the statistically significant interaction effects for problem-solving coping, avoidance coping, and study group ( $F_{2,247}=3.8, p=.02$ ). These interactions identified subgroups of subjects who had improved psychosocial adjustment in different intervention groups in relation to their use of these coping methods at Baseline.

**Table 2**

*Analysis of Variance: Interaction of Problem-Solving and Avoidance Coping Variables with Study Groups for Improved Total PAIS Scores Time 1-2*

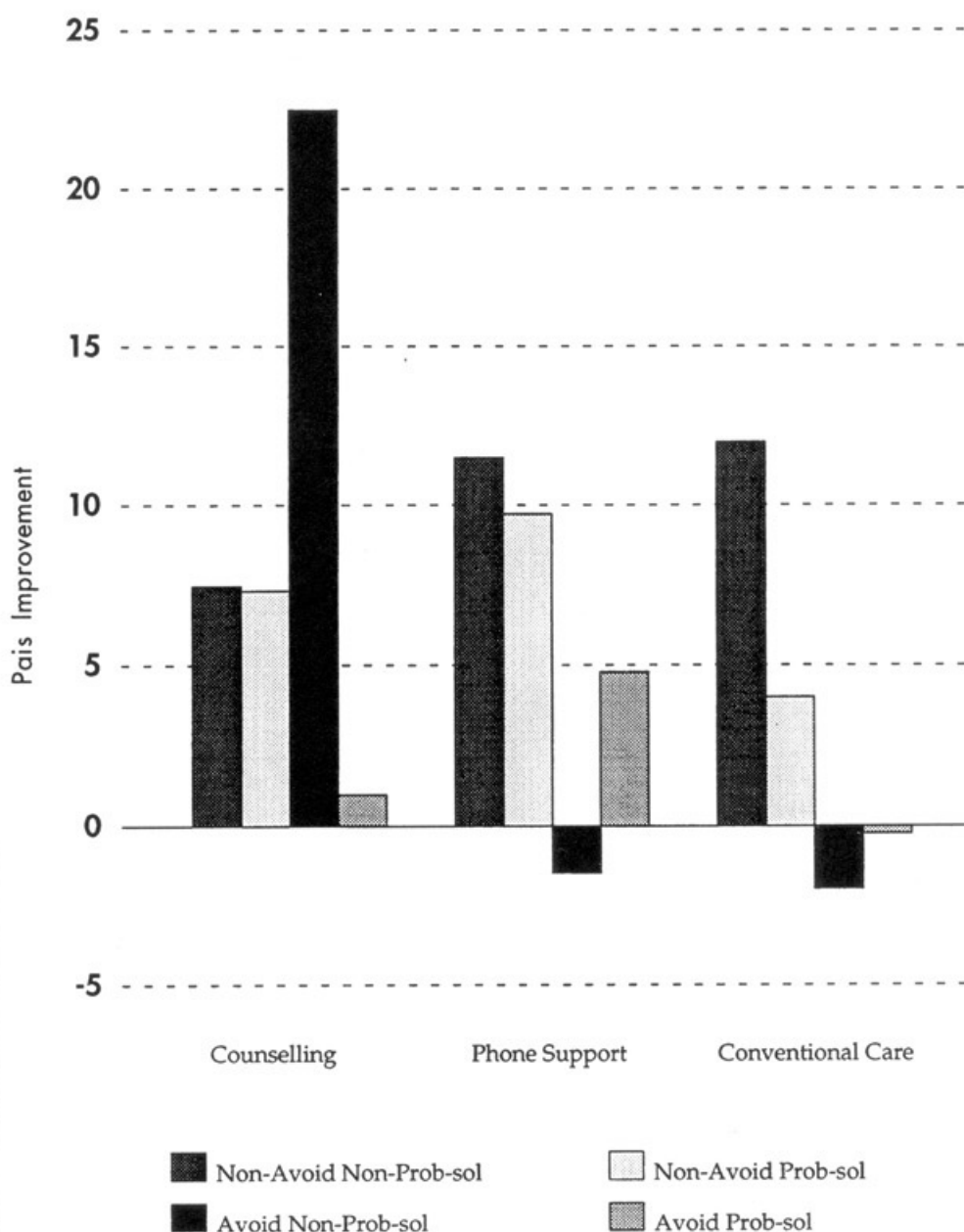
| Variables   | MS     | Df  | F    | p   |
|---|--------|-----|------|-----|
| Group   | 303.9  | 2   | 1.19 | .33 |
| Problem-Solving Coping  | 2077.8 | 1   | 8.18 | .01 |
| Avoidance Coping  | 173.3  | 1   | .68  | .42 |
| Group*Problem-Solving Coping                                      | 432.4  | 2   | 1.70 | .20 |
| Group*Avoidance Coping  | 820.2  | 2   | 3.23 | .04 |
| Problem-Solving*Avoidance Coping                                  | 1.26   | 1   | .50  | .49 |
| Group*Problem-Solving*Avoidance Coping                            | 973.5  | 2   | 3.83 | .02 |
| Residual  | 253.92 | 247 |      |     |
| R <sup>2</sup> = .1060<br>Total F <sub>11,247</sub> =2.66, p=.003 |        |     |      |     |

Figure 2 suggests that the problem-solving intervention was effective for subjects who at Baseline were infrequently using problem-solving coping methods but were using avoidance as a means of coping. Problem-solving counselling appeared to help these subjects to improve their psychosocial adjustment by Time 2, as indicated by improvement in overall PAIS scores. By contrast, among subjects who

infrequently used avoidance coping and frequently used problem-solving coping, those receiving the phone-call strategy showed the most improvement. Subjects who infrequently used both problem-solving coping and avoidance did equally well with phone calls and conventional care. By Time 3, interactions were no longer significant, probably since the intervention had ended six months previously.

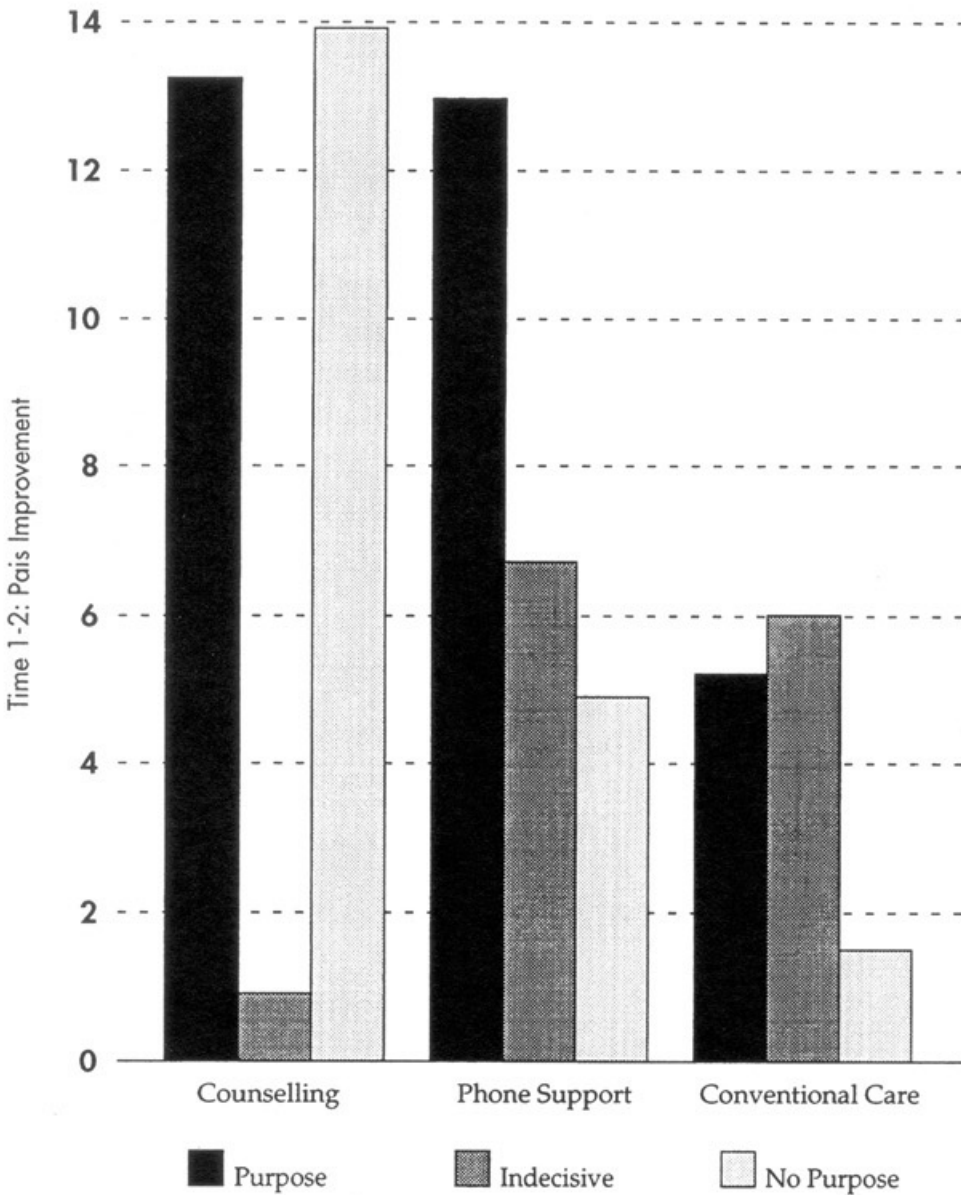
**Figure 2**

*Improvements in PAIS (Time 1-2) Related to Use of Problem-Solving and Avoidance Coping at Baseline and Study Groups*



**Figure 3**

*Improvements in Psychosocial Adjustment Related to the Clients' Purpose in Life at Baseline, and Study Groups*



**3. Purpose-in-life scale.** Post hoc analysis of variance using other non-a priori hypothesized variables demonstrated differences in treatment effect related to categorizing patients according to purpose in life. Purpose-in-life scores were categorized as low, indecisive, or high (Crumbaugh, 1969). Using ANOVA to examine these interactions, there is a statistically significant effect of category (low, indecisive, high) of



purpose in life and treatment group for mean improvement (change) in PAIS scores Baseline to Time 2 ( $F_{4,243}=2.9, p=.02$ ). Figure 3 shows the improvements in psychosocial adjustment for each category of purpose in life and study group. On average, subjects allocated to problem-solving counselling (Group 1) who showed high or low purpose in life had improved psychosocial adjustment scores. Subjects who received phone support (Group 2) improved their psychosocial adjustment if they had high purpose in life at Baseline. In contrast, individuals who received problem-solving counselling and who scored in the indecisive range on the purpose-in-life instrument demonstrated little change in adjustment following counselling and did worse than those in the conventional-care group. The resistance to change in this group of indecisive people cancelled out the gains made by other categories of purpose in life when study group scores were averaged, thus indicating the lack of statistical significance for main effects.

**4. Coping methods by purpose-in-life interactions.** When categorizing patients by purpose-in-life scores and problem-solving coping scores, analysis of variance also indicated that subgroups of subjects with variations of these characteristics also varied in response to treatments (three-way interaction:  $F_{4,234}=2.45; p=.047$ ). The greatest difference among groups was in subjects with little purpose in life and poor problem-solving skills. Problem-solving counselling appeared to help these subjects to make statistically significant improvements in psychosocial adjustment to illness, in comparison to phone-call support and conventional care (Groups 2 and 3), which helped very little. Furthermore, subjects who indicated they used many problem-solving skills and were indecisive in purpose in life at Baseline, and who received problem-solving counselling or phone-call support, demonstrated little change in their PAIS adjustment score compared with those receiving conventional clinic care.

### *Secondary Outcome Measures*

Table 3 shows the differences in mean change scores for study groups in purpose in life, social support, meaning given illness, and coping behaviours, from Baseline to Time 2, just after the interventions occurred. There were statistically significant differences between study groups in two Meaning-of-Illness subscales, Stressfulness and Attitude, and the subscales of the Indices of Coping Response cognitive coping behaviours. Patients receiving counselling or phone support showed increased meaning-of-illness scores, indicating that their meaning given illness became less stressful, more manageable,

**Table 3**

*Comparison of Mean Changes (Baseline to Time 2) of Purpose in Life, Social Support, Meaning of Illness, and Coping Behaviour Scores among 3 Study Groups*

| Mean Score                     | Counselling |        |                |        | Phone-Call |        |                |        | Conventional |        |                |        |      |     |
|--------------------------------|-------------|--------|----------------|--------|------------|--------|----------------|--------|--------------|--------|----------------|--------|------|-----|
|                                | Time 1      | Time 2 | $\bar{x}$ Diff | SD     | Time 1     | Time 2 | $\bar{x}$ Diff | SD     | Time 1       | Time 2 | $\bar{x}$ Diff | SD     | F    | P   |
| <b>Purpose in Life (n=248)</b> | 98.81       | 98.83  | .02            | (14.4) | 100.86     | 100.03 | -.83           | (13.0) | 99.31        | 98.61  | -.70           | (13.5) | .10  | .91 |
| <b>Social Support</b>          |             |        |                |        |            |        |                |        |              |        |                |        |      |     |
| Confidant                      | 16.87       | 17.40  | .53            | (4.6)  | 16.57      | 16.87  | .30            | (4.3)  | 17.87        | 17.39  | -.48           | (4.5)  | 1.17 | .31 |
| Affective                      | 11.58       | 11.54  | .05            | (2.6)  | 11.76      | 11.16  | .60            | (3.1)  | 11.45        | 11.49  | -.04           | (2.7)  | 1.28 | .28 |
| <b>Meaning of Illness</b>      |             |        |                |        |            |        |                |        |              |        |                |        |      |     |
| Little Impact                  | 2.41        | 2.71   | .30            | (1.6)  | 2.60       | 3.08   | .48            | (1.4)  | 2.46         | 2.77   | .31            | (1.7)  | .35  | .71 |
| No Loss, Threat                | 2.31        | 2.46   | .15            | (1.4)  | 2.52       | 2.89   | .37            | (1.4)  | 2.39         | 2.47   | .11            | (1.4)  | .87  | .42 |
| Little Stress                  | 2.67        | 3.03   | .36            | (1.2)  | 2.73       | 3.10   | .38            | (1.2)  | 2.93         | 2.86   | -.07           | (1.1)  | 3.93 | .02 |
| Positive Attitude              | 3.88        | 3.93   | .05            | (1.0)  | 3.88       | 3.92   | .05            | (1.2)  | 4.06         | 3.72   | -.34           | (0.9)  | 3.88 | .02 |
| Not Vulnerable                 | 3.98        | 4.07   | .09            | (1.3)  | 3.78       | 3.69   | -.09           | (1.3)  | 3.83         | 3.72   | -.11           | (1.3)  | .62  | .54 |
| <b>Coping Behaviours</b>       |             |        |                |        |            |        |                |        |              |        |                |        |      |     |
| Cognitive (n=255)              | 17.94       | 19.19  | 1.25           | (5.0)  | 17.53      | 17.93  | .40            | (5.3)  | 17.88        | 17.26  | -.62           | (4.4)  | 3.09 | .04 |
| Behavioural                    | 21.78       | 20.38  | -1.40          | (5.8)  | 23.31      | 21.99  | -1.32          | (6.0)  | 21.58        | 19.37  | -2.21          | (5.8)  | .59  | .56 |
| Avoidance                      | 6.42        | 5.39   | -1.03          | (3.0)  | 6.94       | 6.20   | -.74           | (3.3)  | 6.02         | 5.70   | -.32           | (2.9)  | 1.18 | .31 |
| Logical Analysis               | 6.98        | 7.09   | .11            | (2.3)  | 6.79       | 6.89   | .10            | (3.1)  | 6.92         | 6.70   | -.22           | (2.6)  | .41  | .67 |
| Information-Seeking            | 11.89       | 11.65  | -.24           | (3.2)  | 13.40      | 11.90  | -1.50          | (3.8)  | 12.22        | 11.13  | -1.09          | (3.7)  | 2.84 | .06 |
| Problem-Solving                | 8.89        | 8.47   | -.42           | (3.1)  | 8.57       | 8.58   | .01            | (3.0)  | 8.58         | 7.76   | -.82           | (2.8)  | 1.66 | .19 |
| Affective Regulation           | 9.21        | 9.03   | -.17           | (3.7)  | 9.72       | 9.87   | .15            | (3.7)  | 8.93         | 8.72   | -.21           | (3.5)  | .26  | .19 |
| Emotional Discharge            | 5.06        | 4.36   | -.70           | (2.4)  | 5.30       | 4.92   | -.38           | (2.8)  | 4.61         | 4.09   | -.52           | (2.2)  | .35  | .70 |

and more challenging as compared with the deterioration in meaning of illness observed over time in patients receiving conventional care only. Patients in the counselling group showed an increase in cognitive coping behaviours compared to the other subjects. At follow-up, they more often saw the positive side of the situation, considered alternatives, reassured themselves, or simply accepted their situation. These results need to be viewed with caution due to multiple statistical testing.

### **Discussion**

Certain limitations were apparent in our study. The ethics committee did not permit us to tape sessions between subject and nurse, and thus verification of counselling was mainly made by examining records and through meetings of nurses and supervisors. The fact that mean scores on cognitive coping methods increased with counselling also helped verify that the intervention had occurred, since problem-solving counselling specifically encourages the use of cognitive coping methods. Some of the subscales on our measure of coping were low in internal consistency (Cronbach's  $\alpha < .70$ ). Nurses providing the interventions rated the amount of problem-solving and were obviously not blinded to the patient's assignment group.

Theories have postulated that mediators or buffers may produce the differential individual response to similar stressful circumstances such as chronic illness. Thus one assumes that interventions to improve these buffers would in turn affect quality of life, adjustment to or response to the stressor. The results of this study extend our ideas in stress and coping research one step further, by showing that interventions can be helpful for persons with certain social, cognitive, or coping characteristics; that is, certain interventions enhance the coping variables which buffer the effects of stress. Interventions thought to increase problem-solving behaviours, lend social support, or foster purpose in life will be effective only for a person who needs to develop these characteristics. Others with problem-solving abilities will derive little or no benefit from such interventions and may improve without it. Of utmost importance for research is that these identifying, buffering characteristics be delimited through evaluation of interactions or analysis of subgroups. Thus for nurses in clinical practice, interventions should vary according to the characteristics of the patient.

When no curative health-care interventions are available to obliterate a stressor (as is the case with many chronic illnesses) psychosocial adjustment to illness can be improved by targeting those people most

likely to benefit from either counselling or phone support. The findings of this study support health-promotion strategies and psychosocial approaches by nurses to augment medical care in outpatient clinics. For optimal effectiveness, psychosocial approaches must be matched to the patient's coping, cognitive, and social support characteristics.

### Conclusion

Results suggest that nurses can assist poorly adjusted, chronically ill outpatients by providing individual problem-solving counselling and telephone support, in addition to the patients' conventional clinic care. A number of characteristics of these outpatients can be used to select an appropriate mode of treatment. The nursing intervention should match the coping or support strategies already being used by the patient. For instance, a person's coping behaviours, living support, and category of purpose in life can identify who could potentially benefit from counselling or phone support. Nurses can identify the characteristics through short questionnaires, and nursing interventions can then be tailored.

Of additional importance is that phone-call support helped many chronically ill outpatients with poor psychosocial adjustment, by improving their level of psychological distress. Subjects indicated they had less anger, depression, guilt, and anxiety after phone-call support had been initiated by the nurse.

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