

Assessment of pain coping styles: development of an inventory

Carolyn S Crow RN PhD
Assistant Professor

Linda W Olivet RN DSN
Associate Professor

Judith Burry-Stock PhD
Associate Professor

and Jeanette L VanderMeer RN MSN
Assistant Professor, The University of Alabama, Russell Student Health Center,
Box 870358, Tuscaloosa, Alabama 35487-0358, USA

Accepted for publication 14 November 1995

CROW C S , OLIVET L W , BURRY-STOCK J & VANDERMEER J L (1996) *Journal of Advanced Nursing* 24, 890–898

Assessment of pain coping styles: development of an inventory

The Pain Coping Style Inventory (PCSI) is an instrument designed to measure the pain coping style of individuals. It is based on the pain coping model and typology described by Copp. A study with a convenience sample of 145 university graduates, undergraduates, and faculty revealed a Cronbach's alpha reliability coefficient of 0.90, adequate stability, and a nine factor analysis solution representing 57% of the variance. Four of Copp's five coping styles are clearly defined by the factor analysis: interactive, reactive, combatant, and victim. Five more coping styles are named: contractor, distractor, spiritual coping, substance users, and mind over matter. The development and piloting of the PCSI is a step towards empowering the nurse with the ability to provide patients with individualized pain coping strategies.

INTRODUCTION

Copp (1985) reminds us that the private and subjective world of pain is a formidable barrier to effective and efficient nursing assessment and intervention. There is evidence to suggest that individuals respond to pain with certain coping strategies and a preferred coping style (Copp 1974, 1985). Coping with pain is defined by Brown & Nicassio (1987) as 'the specific thoughts and behaviors people use to manage their pain or their emotional reactions to their pain' (p. 53). The Copp pain coping typology, the primary focus of this research, is derived from the perspective which Lipowski described as 'coping style'.

Lipowski defined 'coping style' as 'an individual's enduring disposition to deal with challenges and stresses with a specific constellation of techniques' (Lipowski 1970 p. 91). An important underlying assumption for the use of the PCSI is acceptance of the Lipowski (1970) definition of coping style. The ability to identify an individual's pain coping style would be invaluable in empowering the nurse to individualize interventions and to reinforce the inner resources of individuals experiencing pain by supporting their coping efforts.

THE STUDY

In order to provide the nursing community with a diagnostic procedure capable of identifying an individual's preferred coping style(s) the *Pain Coping Style Inventory*

(PCSI) was written. The purpose of this study was to document the initial reliability and validity of the PCSI.

There are no previous reports in the literature of pain coping instruments based on Copp's typology of coping styles. However, other instruments have been written attempting to describe the manner in which people cope with pain. Many of these studies have used factor analysis to bring meaning to the theoretical construct of coping with pain. Factor analysis is one of the most widely used statistical procedures for establishing construct validity (Cattell 1978, Nunnally 1978, Crocker & Algina 1986).

Brown & Nicassio (1987) developed the Vanderbilt Pain Coping Inventory to assess 'the frequency with which chronic pain patients use active or passive coping strategies when their pain reaches a moderate or greater level of intensity' (p 53). The inventory consists of 27 items using a five-point scale from 'never' to 'always'. The first sample of 259 rheumatoid arthritis patients provided data for the initial factor analysis. The second sample of 100 was used for confirmatory factor analysis. The authors derived two reliable scales, active and passive coping. They describe the scales as useful for the assessment of coping strategies in clinical settings and particularly in research on chronic pain.

Coping strategy questionnaire

Research by Rosenstiel & Keefe (1983) was directed toward assessing the use of cognitive and behavioural pain coping strategies in patients with chronic low back pain. The authors used the Coping Strategy Questionnaire (CSQ) to determine the extent to which subjects reported using six different cognitive coping strategies and two behavioural coping strategies when they felt pain. Factor analysis was used to identify three factors accounting for the majority of the variance: cognitive coping and suppression, helplessness, and diverting attention or praying.

The CSQ was used in several other studies as well. Keefe *et al* (1990) administered the instrument to 62 chronic low back pain patients to assess the frequency of use and effectiveness of a variety of cognitive and behavioural pain coping strategies. In 1991 Williams and Keefe administered both the CSQ and the Pain Beliefs and Perceptions Inventory (PBAPI) to 120 chronic pain patients to analyse pain beliefs and the use of cognitive-behavioural coping strategies. In the latter study the researchers used multivariate analysis of variance to detect whether the cognitive-behavioural pain coping strategies differed in patients in the three pain beliefs subgroups. 'The results indicated that patients belonging to the group characterized by the belief that pain was enduring and mysterious were less likely to use cognitive coping strategies, more likely to catastrophize, and less likely to rate their coping strategies as effective in controlling and decreasing pain than patients believing their pain to be understandable and of short duration' (Williams *et al* 1991 p 185).

Additionally the CSQ was used by Hill (1993) in assessing the pain coping strategies by patients with phantom limb pain. The factor structure of the CSQ was found to be broadly similar to that obtained in other studies of chronic pain. Three factors were 'cognitive coping,' 'helplessness,' and 'pain denial'. 'Pain report and psychological distress were found to be related to the use of strategies under the "Helplessness" factor' (p 347).

Validity

Rokke & al'Absi (1992) tested the validity of the Cognitive Coping Strategy Inventory (CCSI — developed by Butler *et al* (Butler *et al* 1989)) prospectively. Subjects were randomly assigned to three conditions: 'Some were "matched" to a strategy for which they received a high CCSI score, some were "mismatched" to a strategy for which they received a low CCSI score, and some were given a choice of strategies. The results indicated that the CCSI is a valid and useful tool for selecting a coping strategy to help individuals to manage acute pain' (p 611). It was also determined to be an instrument which is easy to administer and score. Interestingly, though, its use must be weighed against the even more efficient approach offering subjects their choice of treatments. Subjects given their choice of strategies performed as well as subjects matched to strategies by their CCSI scores.

Chronic pain experience instrument

Davis (1987, 1988, 1989) describes the development, testing, and refinement of the Chronic Pain Experience Instrument (CPEI) which was designed to measure the chronic pain experience. The chronic pain experience as discussed by Davis (1989) is the personal response to living with nonmalignant persistent pain. The CPEI is a 16-item inventory which uses visual analogue scaling. The initial testing of the CPEI with 26 patients suffering from rheumatic disease resulted in the retention of 12 items. The second phase of instrument development had a sample size of 160 patients who also suffered with rheumatic disease. Davis reports high internal consistency, adequate stability, and moderate construct validity for the CPEI.

Jaloweic Coping Scale

The Jaloweic Coping Scale consists of 40 coping behaviours to be rated on a five-point scale to indicate degree of use (Jaloweic *et al* 1984). Twenty nurse judges classified the items according to whether they were problem- or affective-oriented. Problem-oriented strategies are used to deal with the stressful situation itself. Affective-oriented strategies are used to deal with the distressing emotions being experienced. Overall agreement by the judges was 85%. Stability was evaluated and confirmed using 28 subjects from the general population with a 2-week test-retest interval.

Content validity was substantiated by the 'systematic manner of tool development, by the large number of items used, and by the inclusion of diverse coping behaviors' (Jalowiec *et al* 1984 p 157) Data from 141 subjects including hypertensive, emergency room, and dialysis patients and a general population group were analysed using Cronbach's alpha. The alpha was 0.86 and supported instrument homogeneity. Using factor analysis the researchers ultimately established construct validity through a four-factor solution. The 1989 report on the Jalowiec scale includes plans to use the instrument with a larger sample and to focus on more sophisticated psychometric analysis.

The studies above report on instruments for the measurement of coping strategies for specific populations experiencing pain. They were not directed toward identifying pain-coping styles. Copp's (1974, 1985) contention that coping styles by individuals in pain may be identified and used to determine nursing interventions provides another way of addressing the issue of coping with pain.

Instrument development and description

Copp's (1974) model includes five typologies which were developed through content analysis of interviews with 148 patients experiencing acute pain. The five categories or types described in Copp's model link the patients' description of pain to their self-image in relation to pain and the description of their usual coping strategies. Copp's typology includes victim, combatant, responsive, reactive, and interactive (Figure 1).

Victims describe pain as merciless, overwhelming, and continuous while seeing self as fragile, alone, and helpless. Victims see few routes open to them and exhibit magical thinking as a coping strategy (Copp 1985). The combatant type views pain as invading and declares war against pain. These individuals are often physically active in coping with pain and expect the health care team to use everything available to help them to fight pain. The third type of individual is described as responsive. The responsive individual searches for the meaning of pain. This search-

Figure 1 Coping model

Pain/self-image	Language	Self-situation	Coping
Type one Pain powerful Coper passive victim	Merciless Cosmic Overwhelming Continuous Irrevocable Irreparable Irrational	Fragile Helpless Dread-filled Abandoned Alone Suffering	Skepticism Fate Ritual Magic
Type two Pain invading Coper combatant	Episodic Strong Sharp Dominating Testing	Fighter Coper Survivor Soldier Confronter	Couterpain Muscle language Delegates Assigns tasks Armamentarium
Type three Pain reality Coper responsive	Testing Demanding Mysterious Hidden Cosmic	Confronter Endurer Suffering Analysing Strategizing	Meditating Focusing Searching for meaning
Type four Pain cunning Coper reactive	Hidden Faceless Sneaky Sly Invading Degrading	Watcher Waiter Monitor Vigilant Ready	Anticipating Rehearsal Review Early warning Not risking Avoidance
Type five Pain demanding Coper interactive	Intense Persistent Sharp Probing Treacherous Ill-tempered Strong	Co-operator Collaborator Communicator Contractor Dependent Reporter Consumer	Contractual Arrangement Permission Compliant Bonding Rule keeper Sets limits

Source: Copp (1985 p 71) Reprinted with permission.

Others have concurred that the VAS is reliable as well as sensitive, providing an infinite number of points for measurement (Aitken 1969, Folstein & Luria 1973, Huskisson 1974) and thus enhancing variability for a factor analysis solution. Though the PCSI is for the identification of coping style rather than pain intensity, the use of the VAS allows a more sensitive measurement of frequency with which certain coping styles are used and with greater variability which provides more information for data analysis.

Sample

The pilot study for the PCSI used a convenience sample of 145 volunteers recruited from university graduate, undergraduate students and faculty. The decision to use this population was based on the assumption that the great majority of young adults over the age of 18 have experienced pain and have developed coping styles. Subjects were male and female undergraduate nursing and graduate education students age 18 or older. The general population of undergraduate nursing students at the University of Alabama is primarily female and Caucasian. Approximately 18% are Afro-American and 11% are males. The general population of graduate students in education at the University of Alabama are primarily Caucasian females with 28% males and 8% Afro-Americans.

Procedures

The following procedures were used to conduct the study:

- 1 Researchers met with selected classroom instructors to explain the study.
- 2 Potential subjects were recruited from a variety of classes in nursing and education.
- 3 A brief letter explaining the study was distributed to the subjects.
- 4 Subjects interested in participating in the study were asked to complete the PCSI anonymously and return it in a manila envelope.

Students were assured that their participation or nonparticipation had no effect on their course grades. The PCSI was administered twice to 41 additional subjects. Two weeks following the first administration the PCSI was administered a second time for the purpose of testing stability. Thirty-six of the initial 41 students completed the inventory a second time. Data were analysed through the use of Cronbach's alpha coefficient, Pearson's product-moment correlation, and principal components factor analysis.

Results

The data were analysed using the Statistical Subprograms Reliability (SPSS Inc 1986) for item analysis and

reliability estimates, and the Statistical Subprogram for Factor Analysis (SAS 1986).

Reliability and item analyses

Cronbach's alpha coefficient was computed on the PCSI data to estimate the internal consistency of the instrument. Nunnally (1978) stated that alpha should be calculated on all instruments as the major source of error within a tool is attributed to domain sampling of items. Subjects completed the PCSI in less than 10 min and no items were left unanswered consistently among subjects. An alpha coefficient of 0.90 ($n=145$) was obtained, which indicates overall internal consistency of the items on the scale (Table 1). For overall reliability standards a coefficient of 0.70 is considered sufficient for basic research and new scales (Nunnally 1978). The PCSI reliability far exceeds this standard.

A test-retest reliability was computed on a subsample of 41 students. The first and second administrations were 2 weeks apart. The test-retest reliability, computed with a Pearson product-moment correlation between the total test scores of the first and second administration was 0.70. This is a 'good' test-retest reliability coefficient for

Table 1 PCSI item-to-total correlations and reliability coefficient ($n=145$)

Item	Correlation	Item	Correlation
1	0.75	26	0.08
2	0.22	27	0.19
3	0.41	28	0.19
4	0.41	29	0.19
5	0.38	30	0.20
6	0.04	31	0.10
7	0.34	32	0.16
8	0.46	33	0.13
9	0.33	34	0.17
10	0.43	35	0.14
11	0.10	36	0.37
12	0.03	37	0.33
13	0.03	38	0.26
14	0.22	39	0.32
15	0.26	40	0.07
16	0.20	41	0.09
17	0.33	42	0.20
18	0.34	43	0.26
19	0.12	44	0.25
20	0.06	45	0.14
21	0.20	46	0.21
22	0.13	47	0.21
23	0.07	48	0.30
24	0.14	49	0.37
25	0.28	50	0.75

Cronbach alpha reliability coefficient = 0.90

an affective measurement instrument. Also, a test-retest reliability coefficient will not usually be as high as a Cronbach alpha reliability coefficient. The inventory was administered with the full 50 items which is quite long. It is anticipated that after this pilot study the PCSI will be shortened.

The most critical reliability coefficient for this pilot study is the Cronbach's alpha of 0.90. This means that the items are internally consistent and are measuring the same thing. Internal consistency is also illustrated by the item-to-total correlations listed in Table 1. Most of the items are above 0.40 which demonstrates that the items are measuring the same theoretical construct. Again, no items were dropped for any statistical analysis because the focus of this pilot study is to investigate the instrument's psychometric properties. Cronbach's alpha and item-to-total correlations provide strong documentation for the PCSI's construct validity.

Although several items did not demonstrate adequate item to total correlations (>0.25) no items have been deleted in this early phase of development. Using more items diminishes domain sampling error and enhances both reliability and validity (Jalowiec *et al* 1984). Additionally, Crocker & Algina (1986) recommend that final decisions about item retention or deletion be made on the basis of a large scale field test, which is planned for the next phase of the study.

Validity assessment

Content validity of the PCSI is supported by Copp's study (see Figure 1), the systematic manner of instrument development, the large number of items used to sample the domain, the inclusion of diverse pain coping strategies, and the extensive literature review of pain coping strategies. Evidence for construct validity was obtained by exploratory factor analysis and supported by internal consistency discussed earlier. According to Nunnally (1978) homogeneity as measured by internal consistency is related to both reliability and validity.

Cronbach's alpha coefficient (0.90) reported is one source of support for the construct validity of the pain coping scale, as the high reliability demonstrates high internal consistency for the theoretical construct of 'pain coping'. Additionally, factor analysis provides a powerful method for construct validation. In factor analysis, clusters of related variables are identified by showing which items share a common variance and thus are measuring the same dimension (Nunnally 1978). The PCSI data were factor analysed to further substantiate the construct validity of the instrument.

Using the Statistical Subprogram for Factor Analysis (SAS 1986) an exploratory analysis provided the initial assessment of the construct validity of the instrument. A principal components solution with an oblique rotation

was used to determine the number of hypothetical factors underlying the observed data. An oblique solution was selected because the hypothesized coping styles were not conceptualized as totally independent dimensions. Additionally, the oblique rotation provided the solution with the best fit.

Although 16 factors met the Kaiser criterion of using all unrotated factors that have an eigenvalue greater than 1.00, only nine factors were retained after rotation. A nine-factor solution provided the best simple structure. The nine factor oblique rotation accounted for 57% of the variability. The item loadings and factor structure of the items with abbreviated item content are shown in Table 2.

The sum of the squared factor loadings and the percentage of variance explained by each factor are presented in Table 3.

The following nine factors were retained:

Factor 1, interactive, accounts for 10% of the variance and incorporates nine items such as 'when I am in pain I seek treatment,' and 'when I am in pain I ask the nurses to help me.' Factor 1 has the highest average loadings on the PCSI. Factor 2, reactive, also accounts for 10% of the variability and incorporates 10 items concerned with thinking through the situation, planning ahead, and setting goals. Factor 3, combatant, accounts for 6% of the variability and includes six items concerned with taking some physical action such as rubbing the area, getting angry, or screaming. Factor 4, the contractor, accounts for 6% of the variability and incorporates five items concerned with contracting with others to help. Factor 5, victim, also accounts for 6% of the variability and includes seven items which imply that someone else should do something about the pain. The individual takes little direct action.

Factor 6, distractor, accounts for 5% of the variability and includes four items which imply thinking of other things. Factor 7, spiritual coping, explains 5% of the variance and includes praying and seeking help from a higher power. Factor 8, substance users, also explains 5% of the variance and includes three items which indicated use of illicit drugs. Factor 9, mind over matter, explains 4% of the variance and includes three items which indicated use of yoga, meditation, and alcohol as a means of coping with pain. The loading of alcohol use with meditation and yoga cannot easily be explained, perhaps, with further testing, the factor structure will change somewhat. The total percentage of the variability, 57%, suggests that the instrument has identified more than half of the variables that have the potential to explain an individual's pain coping style.

The correlations among the nine factors are presented in Table 4.

The low magnitude of the correlations suggests that each factor represents a distinct dimension related to other dimensions of the PCSI without being redundant.

Table 2 Factor loadings and factor structure for the PCSI ($n=145$) Using principle component analysis with an oblique rotation

Inventory item†	Factors*								
	1	2	3	4	5	6	7	8	9
Seek treatment (4)	0.80								
Call physician (9)	0.78								
Do what told (2)	0.73								
Medicine (3)	0.71								
Nurses (10)	0.69								
Follow routines (5)	0.62								
Ask family to help (8)	0.55								
Do what's expected (16)	0.49								
Seek different ways (1)	0.47								
Figure out how it starts (24)		0.73							
Figure out why it hurts (21)		0.68							
Look for early warning (22)		0.64							
Avoid cause (26)		0.64							
Ask questions (38)		0.62							
Set goals (39)		0.60							
Picture ahead (34)		0.51							
Avoid things (15)		0.46							
Past experience (44)		0.45							
Purpose (43)		0.43							
Rub area (18)			0.72						
Rub pain (17)			0.70						
Angry (48)			0.55						
Cry (50)			0.47					0.49	
Be alone (41)			0.46						
Do anything (45)			0.41						
Contracts with nurse (30)				0.84					
Contracts with doctor (29)				0.84					
Contracts with family (28)				0.80					
Delegates jobs to others (23)				0.39					
Rub area away from pain (19)				0.29					
Others tell pain's OK (7)					0.77				
Others make decisions (33)					0.58				
Others tell me pain normal (25)					0.54				
Nothing helps (20)					0.52				
Know I can't do anything (6)					0.45				
Hope it will go away (27)					0.39				
Maintain control (40)					-0.42				
Physical activity (31)						0.66			
Bio-feedback (14)						0.54			
Think of other things (32)						0.50			
Sleep (42)						-0.44			
Seeks help from higher power (37)							0.76		
Pray (36)							0.75		
Personal ritual (35)							0.30		
Illicit drugs (47)								0.87	
Marijuana (46)								0.85	
Scream (49)								0.49	
Meditation (11)									0.63
Yoga (13)									0.61
Alcohol (12)									0.57

*Factors 1 Interactivet, 2 Reactivet, 3 Combatant†, 4 Contractor†, 5 Victim†, 6 Distractor, 7 Spiritual copier, 8 Substance users, 9 Mind over matter

†Factors consistent with Copp's typology (Copp 1985)

Table 3 Variance accounted by nine factors on the PCSI ($n=145$)

Factors	Sum of the square factor loadings	Per cent of variance	Cumulative percentage
1 Interactive*	5.03	10	10
2 Reactive*	4.87	10	20
3 Combatant*	3.07	6	26
4 Contractor	3.04	6	32
5 Victim*	2.89	6	38
6 Distractor	2.68	5	43
7 Spiritual coping	2.43	5	48
8 Substance users	2.43	5	53
9 Mind over matter	2.06	4	57
Totals	28.50	57	

*Types of pain coping identified by Copp (1985)

Discussion

The PCSI demonstrated high internal consistency, a good test-retest reliability, and adequate content and construct validity when used with a limited homogeneous population. The PCSI has the potential to provide a basis for a better understanding of how individuals cope with pain. Continued validation of pain coping styles has the potential to provide the clinician with an assessment and treatment guide, and the researcher with a measurement tool. Testing of the PCSI with more diverse populations and pain aetiologies will be necessary to determine if the characteristics of the pain coping style(s) are the same for other groups and whether the PCSI is a valid and reliable instrument for a wide variety of conditions and persons.

Exploration of construct validity demonstrated support for nine pain coping styles. Further examination is needed to determine whether these nine constructs may be independent dimensions. Additionally, four of Copp's coping styles (1985) can clearly be identified in the present study as illustrated in Table 3. Factor 1, interactive, is most consistent with Copp's type five. These individuals cope with pain by reaching out to those around them. They make

many arrangements and rules about their pain. Factor 2, reactive, is most consistent with Copp's type four. Reactives actively search for early warning of pain, they try to figure it out and avoid it. Reactives, according to Copp (1985), are very introspective.

Factor 3, the combatant, is most similar to Copp's type two. These individuals actively fight pain. They use physical actions and behaviours. They get angry. Factor 4, the contractor, is most similar to Copp's type five. Contractor's engage in strategies that utilize medical services and contract with others. Factor 1 and Factor 4 in the present study both fit Copp's type five, interactive. Factor 5 of this study, the victim, fits well with Copp's type one, also named victim. Therefore, four of Copp's five typologies are clearly represented in this study. Copp's type three, the responder, was not as clearly represented by an independent factor in the present study. Further testing and revision of the instrument may help to account for this discrepancy.

The remaining four factors in the present study represent items added by the investigators as a result of their years of clinical experience and review of the literature. These four factors need to be validated by further testing. Because there is a nine factor solution in this study and some of the factors had very few items loading on them, it is anticipated that the number of factors may decrease with further testing of the instrument. The items will be revised and refined after the next phase of the study in which a general population of subjects will be used.

Conclusion

The findings of 0.90 for internal consistency and the 57% accounting for variability of the measure verify the reliability and validity of the instrument. The duplication of Copp's seminal work where the PCSI factors support most of the original coping styles lends credence to the value of the instrument.

Pain is a frequent patient response in many nursing care situations. The PCSI is intended to be used to diagnose a patient's pain coping style(s) so that specific interventions can be more accurately prescribed. A nurse who can assess

Table 4 Pearson coefficients correlation r among factors on the PCSI ($n=145$)

Factors	2	3	4	5	6	7	8	9
1 Interactive	0.30	0.26	0.19	0.06	0.07	0.09	-0.04	-0.05
2 Reactor		0.33	0.34	0.16	0.13	0.26	0.03	0.09
3 Combatant			0.21	0.20	-0.14	0.24	0.12	0.03
4 Contractor				0.25	0.09	0.25	0.13	-0.10
5 Victim					-0.14	0.09	0.20	-0.14
6 Distractor						0.14	-0.04	0.12
7 Spiritual coping							0.08	0.07
8 Substance user								-0.11
9 Mind over matter								

a patient's preferred pain coping style efficiently and effectively during an initial interview will have information on which to base useful interventions for both patients and families. The need for a measure of pain coping styles is evident from the literature. There are no reported studies that measure pain coping styles based on Copp's typology. Although further testing will provide refinement of the instrument in preparation for its ultimate use in clinical practice this study provides a good beginning. This psychometric study provides evidence that suggests that the PCSI has the potential to provide diagnostic information on people's pain-coping styles in clinical practices. Ultimately, it may provide nurses with valuable information for treating patients.

References

- Aitken R C B (1969) Measurement of feelings using visual analogue scales. *Proceedings of the Royal Society of Medicine* **62**, 989–993
- Brown G K & Nicassio P M (1987) Development of a questionnaire for the assessment of active and passive coping strategies in chronic pain patients. *Pain* **31**, 53–64
- Butler R W, Damann F L, Beaulieu C, Schwebel A I & Thorn B E (1989) Assessing cognitive coping strategies for acute post-surgical pain. *Psychological Assessment* **1**, 41–45
- Carrier V & Janson-Bjerkhe S (1986) Strategies patients use to manage the sensation of dyspnea. *Western Journal of Nursing Research* **8**(3), 284–305
- Cattell R B (1978) *The Scientific use of Factor Analysis in the Behavioral and Life Sciences*. Plenum Publishing, New York
- Child D (1970) *The Essentials of Factor Analysis*. Holt, Rinehart and Winston, New York
- Copp L A (1974) The spectrum of suffering. *American Journal of Nursing* **74**(3), 491–495
- Copp L A (1985) Pain coping model and typology. *Image* **17**(3), 69–71
- Crocker L & Algina J (1986) *Introduction to Classical & Modern Test Theory*. Holt, Rinehart and Winston, New York
- Crow C, Burry J, Olivet L & VanderMeer J (1990) *The Pain Coping Inventory (PCI)*. Unpublished manuscript, Department of Nursing and Department of Education, University of Alabama, Tuscaloosa
- Davis G C (1987) *Preliminary Testing of an Instrument for Measuring the Chronic Pain Experience*. Paper presented at the Sixteenth Annual C N R Spring Research Symposium (April), The Ohio State University, Columbus, OH
- Davis G C (1988) Measuring the clinical outcomes of the patient with chronic pain. In *The Measurement of Nursing Outcomes Measuring Client Outcomes* Vol 1 (Waltz C F & Strickland O L Eds), Springer, New York, pp 160–184
- Davis G (1989) Measurement of the Chronic Pain Experience. Development of an instrument. *Nursing & Health* **12**, 221–227
- Folstein M F & Luria R (1973) Reliability, validity, and clinical application of the visual analogue mood scale. *Psychological Medicine* **3**, 479–486
- Hill A (1993) The use of pain coping strategies by patients with phantom limb pain. *Pain* **55**(3), 347–353
- Huskisson E C (1974) Measurement of pain. *The Lancet* **2**, November 9, 1127–1131
- Jalowiec A, Murphy S & Powers M (1984) Psychometric assessment of the Jalowiec Coping Scale. *Nursing Research* **33**(3), 157–161
- Keefe F J, Crissin J, Urban B J & Williams D A (1990) Analyzing chronic low back pain: the relative contribution of pain coping strategies. *Pain* **40**(3), 293–301
- Lipowski Z J (1970) Physical illness, the individual and the coping process. *Psychiatry in Medicine* **1**, 91–102
- Nunnally J C (1978) *Psychometric Theory* 2nd edn. McGraw-Hill, New York
- Ohnhaus E E & Adler R (1975) Methodological problems in the measurement of pain: A comparison between the verbal rating scale and the visual analogue scale. *Pain* **1**, 379–384
- Pace J (1986) *Oral Ingestion of Encapsulated Ginger and Reported Self-Care Actions for the Relief of Chemotherapy-Associated Nausea and Vomiting*. PhD thesis, University of Alabama School of Nursing, University of Alabama at Birmingham. *Dissertation Abstracts International* **47**, 3297B
- Riley P (1988) *Effects of a Pulmonary Rehabilitation Program on Dyspnea, Self-Care, and Pulmonary Function of Patients with COPD*. PhD thesis, School of Nursing, University of Alabama, Birmingham
- Rokke P D & al 'Absi M (1992) Matching pain coping strategies to the individual: a prospective validation of the cognitive coping strategy inventory. *Journal of Behavioral Medicine* **15**(6), 611–625
- Rosenstiel A K & Keefe F J (1983) The use of coping strategies in chronic low back pain patients: Relationships to patient characteristics and current adjustment. *Pain* **17**, 33–44
- SAS Institute, Inc (1986) *SAS User's Guide Statistics* 5th edn. SAS Institute Inc, Cary, North Carolina
- SPSS Inc (1986) *SPSS Manual* 2nd edn. SPSS Inc, Chicago
- Stark R, Gambles S & Chatterjee S (1982) An exercise test to assess clinical dyspnea: Estimations of reproducibility and sensitivity. *British Journal of Diseases of the Chest* **75**, 269–278
- Stephens A & Holmes R (1985) Mood and pulmonary function in adult asthmatics. *British Journal of Medical Psychology* **58**, 84–87
- Umlauf M, Picket M, Crow C, Bramadat I & Barnett F (1986) *Development of the Assessment of Pain Coping Style Instrument (APCSI)*. Unpublished manuscript, Department of Nursing, University of Texas, Austin
- Williams D A & Keefe F J (1991) Pain beliefs and the use of cognitive-behavioral coping strategies. *Pain* **46**(2), 185–190

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.