

Wellness Lifestyles II: Modeling the Dynamic of Wellness, Health Lifestyle Practices, and Network Spinal Analysis™

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ABSTRACT

Objective: Empirical application of a theoretical framework linking use of Network Spinal Analysis™ (NSA; a holistic, wellness-oriented form of complementary and alternative medicine [CAM]), health lifestyle practices, and self-reported health and wellness.

Design: Cross-sectional self-administered survey study.

Respondents: Two thousand five hundred and ninety-six (2596) patients from 156 offices of doctors who were members of the Association for Network Chiropractic (currently titled Association for Network Care); estimated response rate was 69%.

Measures: Exogenous variables entered into the structural equation model include gender, age, education, income, marital status, ailments, life change, and trauma. A wellness construct consisted of calculated difference scores between two referents, “presently” and “before Network” care, for self-reported items representing wellness domains of physical state, mental-emotional state, stress evaluation, and life enjoyment. Positive reported change in nine items assembled into dietary practices, health practices, and health risk dimensions serve as indicators of the construct of changes in health lifestyle practices. The NSA care construct consisted of duration of care in months, awareness of energy and awareness of breathing since beginning Network care.

Results: Of the exogenous variables only gender, age, and education remain in the final parsimonious structural equation model in these data. Reported wellness benefits accrue to individuals along a direct path from both self-reported positive lifestyle change (0.22), and from NSA care (0.43). The path (0.65) from NSA care to positive health lifestyle changes indicates that NSA care also has an indirect effect on wellness through changes in health lifestyle practices.

Conclusions: The Structural Equation model tested in these analyses lends support to our theoretical framework linking wellness, health lifestyles, and CAM. This study provides further evidence that our measurements of health and wellness are particularly appropriate for investigating wellness-oriented CAM. There is a positive relationship between the experience of NSA care and self-reported improvements in wellness as well as self-reported changes in lifestyle practices. NSA care users tend toward the practice of a positive health lifestyle, which also has a direct effect on reported improvements in wellness. These empirical links are discussed relative to the sociodemographic characteristics of this population and show that use of NSA care is an aspect of a wellness lifestyle.

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INTRODUCTION

WELLNESS has become a popular concept that has been applied by the mass media to fitness and self-help products and services, by work-site wellness/health promotion programs (Sorensen et al., 1998), and biomedical research incorporating health-related quality-of-life assessments (WHOQOL Group, 1998). In addition, mounting evidence and popular wisdom have established a firm link between health lifestyle practices and quality of life, as well as specific health outcomes. This research is based on our theoretical framework that proposes dynamic linkages among wellness, health lifestyles, and complementary and alternative medicine (CAM) (Schuster et al., pp. 349–356). Within our framework, use of CAM, along with typical health lifestyle practices, for the pursuit of wellness is an aspect of what we have termed “wellness lifestyles.” In the context of the present study, the application of this framework highlights both the importance of broader wellness outcomes for assessing effectiveness, as well as the influence of CAM on health lifestyle practices. CAM use, in addition to any direct benefits, may also promote positive health beliefs and behaviors that may then in turn effect improvements in perceived wellness.

CAM modalities vary widely in scope of practice, healing objectives, and individual motivations for use, thus making problematic the study of CAM as a homogenous entity (Cassidy, 1995; Goldstein, 2000). We therefore restricted the present investigation to one particular type of practice within CAM known previously as Network Chiropractic and, since 1995, as Network Spinal Analysis™ (NSA) (Epstein, 1996, 1998, 1999) and practiced by certified practitioners. NSA represents many of the values common to CAM practices and systems including “high-level wellness,” “the interpenetration of mind, body and spirit,” holism/individualism, self-healing, vitalism, the body as a bioenergetic system, and a focus on the natural/ecologic context (Micozzi, 1996; Goldstein, 1999, 2000).

NSA arose out of a school of thought within chiropractic that embraces the original, vitalistic principles of the field and that recognizes an “innate intelligence” that coordinates all functions of the body via the nervous system. The original tenets of chiropractic held that mechanical disturbances in the spine and nervous system could affect the optimum functioning of this innate intelligence, thus interfering with the overall health and well-being of the individual. Growing out of this philosophy, NSA distinguishes its scope of practice from the other school of thought in chiropractic that developed in the 1970s that is based on the palliation of musculoskeletal conditions in accordance with a biomedical or “treatment” model (Koren, 1999; Redwood, 1996).

NSA has further developed into a low force spinal application (i.e., light touches to specific spinal regions) to enhance the cognitive and precognitive awareness of an individual’s spinal structures, body tension patterns, and the

development of unique “somatopsychic” and “respiratory” waves of skeletal motor activity purported to assist in improved self-organization of an individual’s spine and nervous system. When practiced by chiropractors this approach addresses mechanical disturbances in the nervous system and assists the body in developing self-regulating processes to remedy spinal mechanical tension regardless of symptomatology. When practiced as a wellness discipline, it does not have the objective of remedying any condition or returning a patient to a previous minimum standard of health. Rather, the objectives of NSA, as wellness care, are concerned with promoting an individual’s innate capacity to self-regulate their own spinal and neural physiology and thus contribute to an individual’s overall wellness. Use of NSA, as a holistic, wellness-oriented CAM modality, is likely to reflect a wellness-orientation among users; thus, it is an ideal arena for testing CAM use as an aspect of a wellness lifestyle.

The goal of this study was to present a model derived from our theoretical framework that demonstrates the operationalization of wellness as an integrated construct, and explores wellness lifestyles by illustrating the dynamic influential processes across NSA, health lifestyle practices, and self-reported health and wellness. More specifically, we investigate whether aspects of NSA care, as an example of an holistic form of CAM, may influence individual improvements in health lifestyle practices, and how much those improvements effect self-reported health and wellness benefits, in addition to any direct wellness benefits of NSA care. In order to isolate these basic dynamics, social structural influences impacting these processes, such as gender, age, socioeconomic status (income and education), and marital status, as well as specific life challenges that represent stressors were included as statistical controls. This theoretical model represents an integrated collection of constructs and hypotheses about the possibility of a wellness lifestyle that are tested simultaneously in our data.

METHODS

Sample characteristics

The data used in this study are from a cross-sectional, self-reported survey of patients under Network Chiropractic in 1994 (Epstein, 1996). Surveys were sent to all 330 practitioners registered as members of the Association for Network Chiropractic (ANC); 9 practitioners were not actively practicing, leaving 321, with 156 practitioner offices responding by administering surveys to their patients, yielding a practitioner response rate of 49%.

Patients were sampled according to the following inclusion criteria: (1) 18 years of age or older and (2) under care for 1 month or more as of the survey date on the clinical assumption that the cumulative benefits would then be as-

sessable. Practitioners were instructed to sample all practice members (patients) unless there were more than 100 in the practice. If it was not possible to administer the survey to all patients, practitioners were asked to sample all those who visited the practice on a given day(s).

In a study of this size, using a census design, it is difficult to ascertain the size of the patient population accurately, therefore, we estimated the response rate. During the study period we conducted further systematic data collection to determine the average size of a Network practice. In two practitioner samples, the median was determined to be 40 practice members. The sample was estimated to be somewhere between 3972–4221 patients. This estimate was based on exclusion of practice members 18 years of age and under (5%–7%), those within 1 month of care (15%–17%), and adjusting for the number of patients from 12.4% of practices who had 100 patients or more and who therefore randomly sub-sampled their patients. This gave an estimated response rate of 67%–71% (Blanks et al., 1997). The final analyses for this study are based upon the 2596 respondents for whom complete data were available.

Sample sociodemographic characteristics are consistent with other CAM surveys (Table 1), with a predominance being women (73%), middle-aged (43 ± 11 years), approximately one third postgraduate-educated (37%), and with a median personal income in the \$25,000–\$35,000 range (62% less than \$40,000 per year). Approximately one half of respondents were married.

Fifty-five percent (55%) of respondents reported persistent ailments, and 47% reported a significant life change (in either marital status, residence, or occupation) since beginning Network care. Respondents were asked to rate the degree of physical, emotional, and chemical trauma (if any) they had ever experienced. A summary measure combining these three items revealed that only 13% felt they had never experienced any trauma. On this constructed scale, the average score was $6.0 (\pm 3.5)$, scale of 0–12). The average duration of NSA care was 21 ± 27 months. Seventy-eight (78%) of respondents indicated that they were aware of energy or rhythmic spontaneous movement in their body (a physiologic response unique to individuals undergoing NSA care), and 81% reported that they were more aware of their breathing since receiving NSA care.

Measurement of latent constructs

Wellness. As reported in our earlier paper (Blanks et al., 1997), an instrument appropriate for measuring health and wellness broadly was developed for this survey. Confirmatory factor analyses further supported the earlier reliability studies which indicated four distinct domains within the overall Self-Rated Health and Wellness (SRHW Version 1.0) instrument, including the wellness themes of physical state, mental/emotional state, stress evaluation, and life enjoyment. Individual items were developed in close consul-

tation with practitioners and patients regarding experiences with NSA care, and included adaptations from existing instruments as well as original constructions. The item format was developed to explicitly elicit self-perceived changes in wellness since beginning NSA care by asking respondents to rate their level of health and wellness both “presently” and “before Network.” This approach goes beyond retrospective recall (e.g., patient medical histories) to provide the individual’s self-aware evaluation of differences before they received Network care, and makes clear the cognitive standard of comparison for present wellness which is missing in health ratings that ask only for current status.

The mean for these four self-rated health domain scales “presently” were approximately 67% of the maximum possible score, while the mean for ratings retrospectively recalled “before Network” were approximately 50% of maximum (the midpoint in the possible range). This study utilizes the calculated difference scores between the respondents’ “presently” and “before Network” perceptions within each wellness item (theoretical range -1.00 to 1.00 with 0 indicating no difference in score; see Table 1). The average difference for the stress evaluation scale was $+0.20$, indicating approximately 20% higher perceived score presently (range, -0.60 to 1.00). The perceived difference in the mental/emotional state and life enjoyment scales was about $+0.17$ (range -0.50 to 0.94 , and -0.86 to 0.77 respectively), while on average physical state was rated at approximately $+0.15$ (range, -0.32 to 0.77).

To illuminate the relevance of these numbers further, Table 1 includes effect sizes for each domain, which represent the magnitude of clinical or meaningful variation. Calculation of effects sizes compares the mean sample difference in individuals’ scores “presently” to the amount of deviation across the scores of all respondents “before Network” (that is, the normal range of the majority of individuals’ initial scores) (Cohen, 1977). Effect sizes of 0.20 are considered small, 0.50 moderate, and 0.80 large; thus, the range of 0.91–1.15 across the separate scales indicates that a large positive clinical outcome had occurred within all domains. The items assembled into these four themes or constructs serve as indicators of the latent or more conceptually abstract construct of wellness.

Health lifestyle change. A lifestyle change index was developed that measured a broad range of health behaviors identifying a healthy lifestyle. In this study, the latent construct is based on perceived change in these practices, and thus represents an individual’s health lifestyle while under NSA care. Nine items were selected for inclusion in the lifestyle index, representing three distinct areas of health behavior: dietary practices, health practices, and health risky behaviors. The dietary practices dimension included three items: use of health food/vitamin supplements, organic food/whole grain consumption, and vegetarian diet. The health practices dimension included four items: regular ex-

TABLE 1. FREQUENCIES FOR VARIABLES ENTERED INTO THE MODEL ($n = 2596$)

		Percent (%)	
Exogenous Variables			
Age (42.9 ± 10.9 years)	18–28	8.1	
	29–35	16.3	
	36–42	27.8	
	43–49	24.8	
	50–56	12.0	
	57–63	6.0	
	64+	5.2	
Male		26.8	
Married		49.8	
Education (postgraduate)		36.6	
Income <\$40,000 per year		62.3	
Life Challenges			
Persistent Ailments		54.7	
Significant Life Changes		46.8	
Trauma (no trauma, 0, most extensive 12)		6.0 ± 3.5	
NSA Care			
Awareness of Energy		78.2	
Awareness of Breathing		81.1	
Time in NSA care (21 ± 27 months)	0–3 mo	14.8	
	3–6 mo	11.8	
	6–12 mo	15.7	
	12–24 mo	28.9	
	24–36 mo	13.6	
	36–48 mo	6.3	
	48+ mo	9.5	
	<i>Mean</i>	<i>SD</i>	
Health Lifestyle Changes (Positive Change, Range 0–1)			
Healthy risk dimension			
Smoking	0.08	0.26	
Coffee consumption	0.26	0.44	
Dietary practices dimension			
Vegetarian diet	0.39	0.49	
Vitamin consumption	0.45	0.50	
Organic food consumption	0.46	0.50	
Health Practices Dimension			
Regular exercise	0.40	0.49	
<i>Tai Chi</i> /yoga	0.20	0.40	
Meditation	0.48	0.50	
Relaxation techniques	0.46	0.50	
	<i>Mean sample difference</i> (Presently–before network care)	<i>SD</i>	<i>Effect size</i>
Wellness (Range –1–+1)			
Physical state—Mean of Items	0.15	0.26	0.94
Mental-emotional state—Mean of Items	0.17	0.16	0.91
Stress evaluation—Mean of Items	0.20	0.20	0.98
Life enjoyment—Mean of Items	0.17	0.16	1.15

SD, standard deviation.

ercise, relaxation/self-hypnosis, meditation/prayer, and *tai chi*/yoga. The two items included in the health risky dimension included smoking and caffeine consumption. Beef consumption was initially included in this dimension but

was deleted because it was too highly correlated with vegetarian diet in the dietary practice dimension. While these items do not encompass the totality of health behaviors assessed in the literature, they were selected based on the pre-

dominance of evidence that suggests consistent correlation between use (or avoidance) and bio-psycho-social health. Preliminary factor analysis showed items loaded on three factors that were consistent with the three constructed dimensions. The lifestyle index containing all nine items, showed internal reliability ($\alpha = 0.766$).

Survey respondents were asked to report the extent of change "at present" in each lifestyle item on a scale of -3 to $+3$, with -3 reflecting the greatest decrease in the particular behavior, $0 =$ no change in behavior, and $+3$ reflecting the greatest increase in the behavior. Because there were positive and negative lifestyle items, the items were then recoded as a dichotomous variable to reflect "positive lifestyle change." If respondents reported an increase in what was considered a health beneficial behavior, such as exercise, the value for positive lifestyle change was coded as a 1 for that item (see Table 1 for distribution of each item). Only 8% of respondents reported a positive change in smoking behavior, with approximately one fourth to one half of respondents reporting positive changes in the other eight behaviors. The items assembled into the dietary practices, health practices, and health risk dimensions serve as indicators of the latent construct of health lifestyle change.

NSA care. The latent construct representing the experience of Network care was indicated by three variables: length of time in care (categorized in months), whether or not the individual is presently more aware of energy or rhythmic spontaneous movement in his or her body, and more aware of his or her breathing. Duration of care is considered indicative of a commitment to the long-term health promotion objectives of Network care. The last two items represent a respondent's experience of NSA care as the somatopsychic and respiratory waves (physiologic responses unique to this form of care), and are considered essential clinical indicators of progress by practitioners. Further elaboration of the unique physical responses experienced by recipients, the clinical objectives and the theoretical, biophysiological mechanisms underlying this form of care can be found in Epstein (1996, 1998, 1999).

Exogenous variables. Exogenous concepts represent other known influences on the constructs (wellness, lifestyles, NSA care) that are included in the analyses in order to statistically control their impact, thus randomizing their influence and isolating the independent effects among the constructs in our theoretical model. Several variables reflecting the concept of life challenges were included. The presence of persistent ailments was a single item assessed dichotomously (present or not), and included in the model in order to account for the influence of chronic conditions. Measurement of significant life changes was a dichotomous item indicating a change in marital status, occupation, or residence since beginning care because stressful life events are known to influence health. Also included was a sum-

mary item establishing the degree of physical, emotional, and chemical trauma experienced by the respondent that ranged from 0 to 12. Sociodemographic variables, specifically gender, age (categorical), marital status (dichotomous married/not), postcollege education (dichotomous yes/no), and income (in dollars, midpoint of range), were included in the model since these social categories are known associates of health outcomes.

Analyses

Analyses of the data using SPSS (version 9.0 SPSS, Inc., Chicago, IL) and AMOS (version 4.0 SPSS, Inc.) were conducted in several phases, with univariate and bivariate analyses first, followed by confirmatory factor analyses of the latent variables, and concluding with the building and testing of the model itself. "The primary purpose of structural equation modeling [(SEM)] is the testing of causal theories using nonexperimental data" (Martin, 1987). SEM is a sophisticated form of regression analysis that compares the estimated (co)variances under the specified model to those that are observed (Bollen, 1989). Various relationships are thus simultaneously tested (Hoyle and Smith, 1994) through a combination of factor analysis and regression techniques. The model actually consists of two models: a measurement model and a structural model. The measurement model reflects the relationships between the observed variables and the hypothesized constructs (latent variables of wellness, lifestyle, care). The structural model consists of all of the simultaneous relationships among these latent variables, which are then regressed on all variables hypothesized to be causal precedents of those variables. This is an iterative process that begins with an initial theoretical model, which is then tested against the data and modified based on statistical conventions but within the constraints of the initial theoretical framework.

There are several indices that can be used to test how well a proposed model fits a given data set. In the current study, the root mean square residual (RMR) and the comparative fit index (CFI; Bentler, 1980, 1999) were selected as the main fit indices for reasons of sample size and number of parameters. The root mean square error of approximation (RMSEA; Steiger, 1990) was used as the main measure of parsimony. Parsimony means the simplest explanation is preferred; for example, the fewest paths necessary to satisfy both the theoretical model and a given data set. Parsimony and fit were greatly improved for the reduced model (CFI of 0.938 and RMR of 0.025, and RMSEA of 0.052 compared to CFI = 0.829 RMR = 642.973 RMSEA = 0.065 for the initial model). Therefore, the reduced model was considered a more accurate representation of the nature of the relationships between characteristics of individual respondents, their health lifestyle practices, their experience of NSA care, and their perceived difference in wellness domains since beginning NSA care.

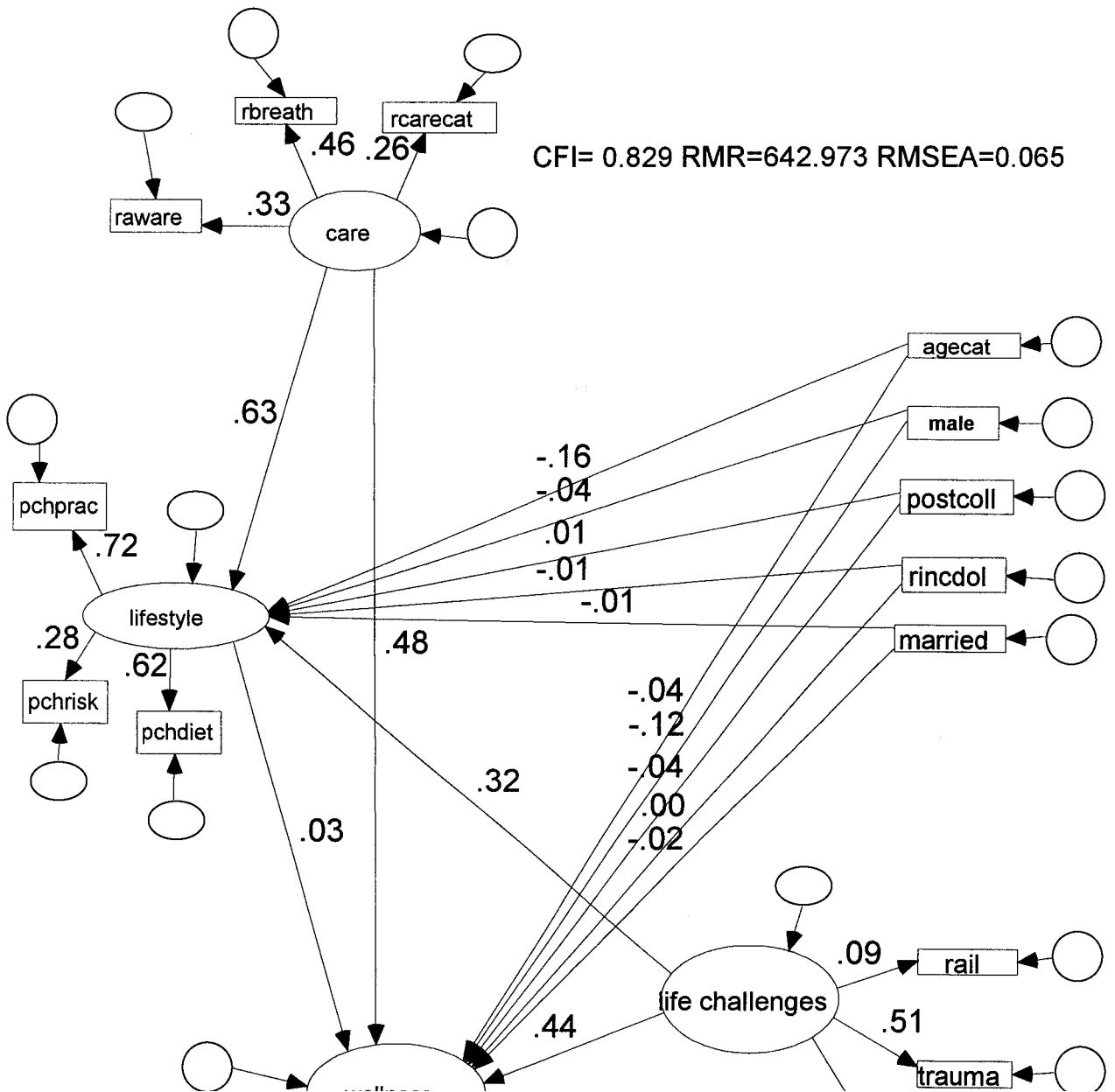


FIG. 1. (cont'd)

Key to Construct and Variable Labels

Ovals = hypothesized constructs

Rectangles = measured/observed variables (sets of variables)

Circles = measurement error

Exogenous Variables

agecat: age in categories (see Table 1)

male = 1

postcoll: postcollege education = 1

rincdol: income in dollars, midpoint of range (\$15, \$30, \$40, \$50, \$60 thousand)

married: married = 1

LIFE CHALLENGES = Life Challenges Construct:

rail: presence of persistent ailments = 1

trauma: degree of physical, emotional, chemical trauma
0–12siglife: change in marital status, occupation, or residence
= 1**CARE = NSA Care Construct:**

rcarecat: length of time in care categorized in months

rbreath: presently more aware of energy = 1

raware: presently more aware of breathing = 1

LIFESTYLE = Health Lifestyle Change Construct:

pchdiet: positive change in dietary practices = 1

pchrisk: positive change in health risky behavior = 1

pchprac: positive change in health practices = 1

WELLNESS construct:

dfstrs: differences scores in stress evaluation items

dfphys: differences scores in physical state items

dfemos: differences scores in mental/emotional state items

dfenjs: differences scores in life enjoyment items

relative contribution of different variables in the model are denoted by the standardized regression (path) coefficients corresponding to arrows in the model, which were statistically significant ($p < 0.05$). For a detailed explanation about how to read path coefficients see Bollen and Long (1993).

Inspection of Figure 2 shows the importance of the remaining individual sociodemographic characteristics. The coefficient of -0.06 between gender and Wellness indicates that females report slightly greater differences in wellness scores than males, while the coefficient of -0.17 for the path from gender to NSA care suggests that females in this sample have been receiving NSA care longer than males and are more likely to report the clinical indicators of progress. There is not a significant association between gender and changes in health lifestyles. Individuals in older age categories are less likely than younger individuals to report positive changes in health lifestyles (-0.14), and show weaker indicators of NSA care experience (-0.12), while age does not appear to influence perceived differences in wellness. A postcollege level of education was an important contributor to perceived wellness (-0.05), but not health lifestyles or NSA care.

In the final model, reported wellness benefits accrue to individuals along a direct path from both self-reported positive lifestyle change (0.22), and from NSA care (0.43). Note that NSA care directly contributes more than health lifestyles to self-reported improvements in wellness by a factor of 2:1. In addition, the path (0.65) from NSA care to positive health lifestyle changes provides evidence that these individuals are likely to have also effected positive changes in their health-related lifestyle practices (which, in turn, impacts wellness) during the time they received NSA care. Thus, NSA care contributes both directly and indirectly (through lifestyle) to self-reported wellness.

DISCUSSION

This study represents the first empirical application of our theoretical framework which proposes dynamic links among wellness, health lifestyle practices, and an holistic form of CAM (Schuster et al., pp. 349–356), in this case, Network Spinal Analysis.™ We utilized SEM to investigate relationships among these constructs, and found evidence that health lifestyle practices influence wellness, and NSA impacts wellness both directly, and indirectly through influence on health lifestyles practices. These complex interrelationships, then, indicate that use of NSA as a wellness-oriented CAM modality is an aspect of a wellness lifestyle.

The results of our investigation also provide evidence that positive health and wellness can be operationalized and utilized to comprehensively investigate the benefits associated with holistic CAM modalities. The confirmatory factor analyses strengthen the conclusions from our earlier reliability studies that these survey items meaningfully capture four coherent wellness themes as well as an overall integrated wellness construct. The retrospective recall approach taps into explicitly referenced individual self-perceptions; the breadth of these items taps into multiple domains of health, and the statistical strategy integrates the domains into an unconstrained generalized self-perception of health we have termed wellness (Schuster et al., pp. 349–356). With this we were able to detect positive change in an already well population. We anticipate that the current revision of our SRHW instrument will more fully address each of the domains of health (physical, mental, social, and spiritual), as well as other known precursors to health (e.g., positive and negative aspects of the immediate social environment of interpersonal relationships) to yield yet more informative results.

This study demonstrates several major findings. A positive relationship between NSA experience and self-reported wellness was supported by these analyses. Self-reported positive changes in health lifestyle practices also influenced wellness. NSA experience had a direct impact on positive changes in health lifestyle practices. Finally, our results illustrate the relative importance of the sociodemographic factors of age, gender, and education on these interrelationships.

The substantial path coefficient linking NSA care and

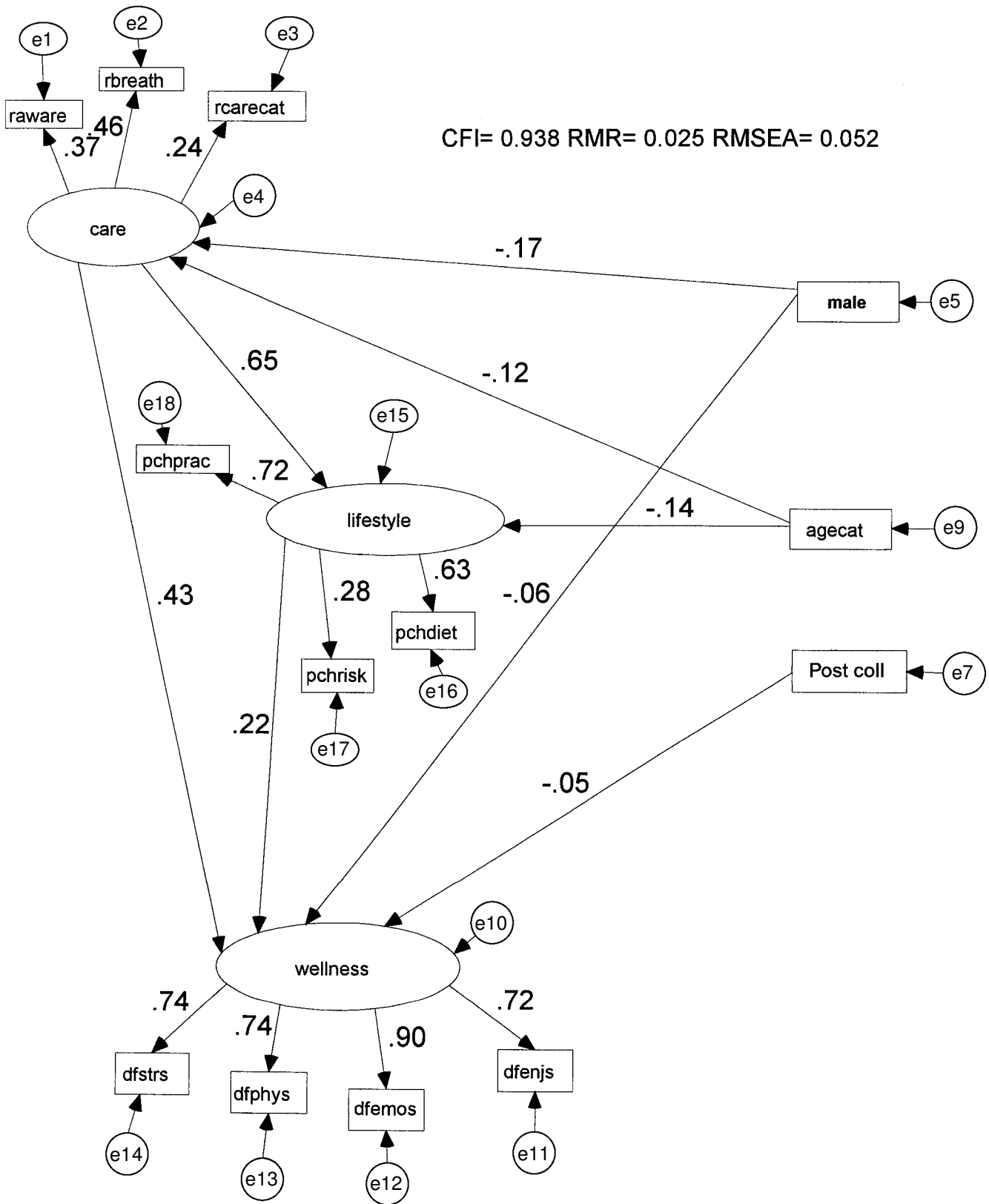


FIG. 2. Reduced final structural equation model. (See facing page.)

FIG. 2. (cont'd)

Key to Construct and Variable Labels

Ovals = hypothesized constructs

Rectangles = measured/observed variables (sets of variables)

Circles = measurement error

Exogenous Variables

agecat: age in categories (see Table 1)

male = 1

postcoll: postcollege education = 1

rincdol: income in dollars, midpoint of range (\$15, \$30, \$40, \$50, \$60 thousand)

CARE NSA = Care Construct:

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pchdiet: positive change in dietary practices = 1

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WELLNESS construct:

dfstrs: differences scores in stress evaluation items

dfphys: differences scores in physical state items

dfemos: differences scores in mental/emotional state items

dfenjjs: differences scores in life enjoyment items

wellness represents the independent influence of NSA care while statistically controlling for other known contributors to wellness, and thus increases confidence that the relationship is not caused by some extraneous associated influence. These results augment the findings of our earlier investigation (Blanks et al., 1997), which showed a significant bivariate association between length of time in care and a summated scale of self-perceived differences in wellness items during NSA care.

Another noteworthy finding is that self-reported positive changes in health lifestyle practices influence wellness. While popular wisdom may suggest this, few empirical studies have provided evidence of such a linkage. While the magnitude of the effect is only half that of the impact of NSA on wellness, it represents the direct, independent effect of positive lifestyle changes on wellness. This result may be unique to this population currently participating in NSA, but is further evidence that use of wellness-oriented CAM may be part of a wellness lifestyle.

Particularly important is the impact of NSA experience on positive changes in health lifestyle practices. NSA care itself is not administered with this objective in mind (see Epstein, 1996), and most practitioners are not trained or practicing as lifestyle or nutrition experts during individual sessions. The mechanism by which NSA care promotes a greater sense of wellness and healthier lifestyle choices is unknown. Individuals may be making positive lifestyle

choices based on common health beliefs or values that likewise may self-select them to this type of care. The value of health and wellness as an end itself (see Schuster, et al., pp. 349–356) may be part of our culture's growing focus on individual responsibility for health, which may influence the use of NSA and other CAM modalities. Nevertheless, the significance of NSA (and perhaps other CAM) users engaging in health promoting practices and avoiding health risks without specific patient education programs or urging by the practitioner represents a potential milestone to public health/lifestyles research. Regardless of the specific causal relationships between health lifestyles and CAM use, our findings support the concept of a wellness lifestyle.

Our theoretical framework (Schuster, et al., pp. 349–356) proposed several variables affecting the dynamics among the constructs that were dropped in the final model because they made statistically inconsequential contributions and were not central to the overall theoretical framework. Nevertheless, their exclusion in the final model is informative. Changes in marital status, job, and residence have been shown to be intense life stressors, so it is notable that significant life changes, as well as degree of trauma, did not affect wellness in the final reduced model, perhaps suggesting that NSA care has stress-buffering effects. That is, NSA care is associated with higher levels of wellness in which individuals perceive themselves able to meet life challenges and thus do not experience them as stressful. Similarly, although we predicted that persistent ailments would impact changes in health lifestyles and wellness, neither of these paths remained in our final model for this population. This is an important finding, lending evidence to our conceptualization of wellness lifestyles, and of wellness as a different and perhaps independent construct than the absence of physical ailments.

While income is associated with duration in care, it did not remain in the final model as it is not as strong a predictor as education (with which it is correlated), which may be more closely associated with positive health lifestyles and pursuing wellness as an end in itself. Age also remained in the final model, suggesting the while older age does correspond to a lower likelihood of lifestyle changes, it is not predictive of wellness improvements. Gender also remained in the final model, effecting both NSA care experience and wellness. Marital status, highly correlated with gender, but not as strong a predictor, fell out of the model. One explanation for the effect of gender is that women are more likely to utilize health care than men (Verbrugge, 1985), and have different definitions of health (Kenney, 1992). Given the complex interrelationships among sociodemographic variables and latent constructs, we suggest that none can be understood independent of the others.

These findings must be interpreted within the constraints of cross-sectional data and SEM. Cross-sectional data are limited in their ability to explain causality because the data are constrained to a single timeframe. However, our retro-

spective recall method provides some measure of perceived differences in self-rated health and wellness while under care beyond that customarily provided in cross-sectional measures. Direct evidence of over-time changes in wellness and wellness lifestyles will require longitudinal data, which are vital next-steps in CAM research. While SEM is a powerful tool in the testing of complex causal theories, such as our wellness lifestyles framework, it represents a necessarily simplified approximation of reality. The results of SEM are subject to the accuracy of the basic theoretical assumptions, as well as the *a priori* assumptions regarding data requirements inherent to multivariate statistical analyses (Bollen, 1989).

The dynamics of a wellness lifestyle captured in this research are necessarily tied to the specialized study population of NSA users. As we suggested, given the diversity of techniques and philosophies subsumed under the umbrella of CAM, studies of effectiveness need to focus on a single modality in context. This particular population was selected on theoretical grounds (see Schuster et al., pp. 349–356), representing a wellness, holistically oriented CAM modality. Whether these wellness lifestyle dynamics operate within other such CAM modalities, other less holistic CAM modalities, or conventional medicine, is an important question for future research, which we believe must include refined measurement of health lifestyle practices and beliefs.

Further research using this model may assess the extent to which use of CAM in specific populations (e.g. the elderly, men, particular ethnic groups) may contribute to broad health outcomes. Wellness is a useful framework for outcomes research because not all use of CAM is for medical complaints alone, and the motivations for use must be factored into appropriate outcome assessments. Individual motivations and health beliefs could be more thoroughly investigated through the use of more qualitative or ethnographic research, as could the consequences of the relationship between the user and the practitioner on expectations and effectiveness of care. Such in-depth investigation would be highly useful in providing richer explanatory data, to further elucidate the processes linking wellness, lifestyles, and CAM in our theoretical framework. This information will be beneficial in refining the direction of the causal pathways of our theoretical framework.

We encourage further research using this framework and methodology, particularly using longitudinal designs, broader wellness and lifestyle measures, other CAM and conventional healing modalities, as well as more diverse sociodemographic representation, in order to clarify cause-effect relationships between CAM and the elements contributing to wellness and a wellness lifestyle. This application of our strategy for CAM research upholds the importance of broader wellness outcomes for assessing CAM effectiveness, the influence of CAM on health lifestyle practices, and the concept of wellness lifestyles.

ACKNOWLEDGMENTS

The authors thank Ralph Boone, Ph.D., D.C., Donald Epstein, D.C., Peter Clecak, Ph.D., May Huong, B.A., Catherine Kravitz, B.A., and anonymous reviewers for their helpful comments. Financial support was provided by the Association for Network Care Research, the University of California, Irvine, Transdisciplinary Tobacco Use Research Center, and the University of California, Irvine Undergraduate Research Opportunities Program.

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