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# Intentions of Chiropractic Interns Regarding use of Health Promotion in Practice: Applying Theory of Reasoned Action to Identify Attitudes, Beliefs, and Influencing Factors

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**Marion W. Evans, Jr.** DC, PhD, CHES, Cleveland Chiropractic College, **Harrison Ndetan**, MSc, MPH, Parker Research Institute and **Ronald D. Williams, Jr.** PhD, CHES, Southeast Missouri State University

**Purpose:** The theory of reasoned action is a health behavioral theory that has been used to predict personal health behaviors and intentions as well as those of providers delivering health care. The purpose of this study was to determine interns' future practices regarding the use of health promotion using this model to develop survey questions and to determine attitudes and perceived influences on their prospective behaviors in general, toward the use of health promotion once in practice. **Methods:** Across the course of one year, all graduating interns at a chiropractic college were queried with a 20 question survey designed using the theory of reasoned action. Frequencies and inferential statistics were performed including prediction modeling using logistic regression. **Results:** A majority (>85%) of interns indicated they would use health promotion in practice. Differences were noted based on perceived skill levels, perception of educational emphasis, various normative beliefs, and gender. **Conclusion:** Most interns will use some form of health promotion in practice. Normative influences including those seen as key influencers are as powerful a predictor as perceived education or skill levels on future practice of health promotion. (J Chiropr Educ 2009;23(1):17-27)

**Key Indexing Terms:** Chiropractic; Health Promotion; Public Health Practice; Health Behavior

## INTRODUCTION

The chiropractic profession treats a variety of spine-related disorders with neck, back, and other joint conditions among the most prevalent.<sup>1</sup> Studies evaluating the co-morbid conditions associated with chronic spinal disease indicate a higher prevalence of many other chronic disorders than the population in general.<sup>2-4</sup> In addition to those indications that spinal patients may need more emphasis on general preventive care, numerous agencies, researchers, and accrediting bodies have called for more prevention and health promotion education emphasis within the practice of health care delivery.<sup>5-9</sup> Limiting morbidity and disability from back conditions is also a focus area under *Healthy People* guidelines.<sup>6</sup>

In January of 2006 the Council on Chiropractic Education (CCE) put in place a new standard for the delivery of health promotion (HP) and "wellness" based education for America's chiropractic colleges.<sup>8</sup> This included the demonstration of the ability to determine how lifestyle, behavior, and other factors affect the wellness of the patient and the demonstration of skills, knowledge, and ability to communicate needs regarding required changes in lifestyle that will be conducive toward better health.

Hawk and colleagues<sup>10</sup> pre- and post-tested intentions of interns to use health promotion techniques at a chiropractic college in 2003 through a model course on wellness concepts and health promotion. Slight increases in intent were noted during the education process but a majority had predetermined they would use health promotion so statistically significant differences were rare from pre to post evaluation. They suggested the didactical methods of teaching health promotion be integrated into the clinical education as well and practical application

of health promotion be emphasized in chiropractic education. The intentions of chiropractic interns regarding the use of health promotion in practice can also be assessed applying the theory of reasoned action (TRA).

**The Theory of Reasoned Action and Health Promotion Research**

The TRA explores health behaviors in relation to intentions, beliefs, and attitudes.<sup>11-13</sup> The TRA suggests that an essential determinant of behavior is an individual’s behavioral intention. The theory proposes that behavioral action is determined by intentions with an individual’s intention to perform a behavior determined by attitude towards the behavior and normative beliefs. For example, if an individual

believes that a positive outcome will result from a given behavior, then the likelihood of performing that behavior increases. Conversely, if a person feels the behavior will yield a negative outcome, then the person will also hold a negative attitude toward performing the behavior and therefore a negative intention to perform it. Figure 1 graphically demonstrates the relationship of TRA constructs.<sup>14</sup> Table 1 provides construct definitions.<sup>14</sup>

The TRA has been used extensively in health promotion research and health behavior in an attempt to predict behavior through examination of behavioral intentions. If health professionals can understand and predict motivational influences on behavior, it is conceivable to think that such influences can be modified to yield more positive health outcomes. Behavioral intentions have been studied

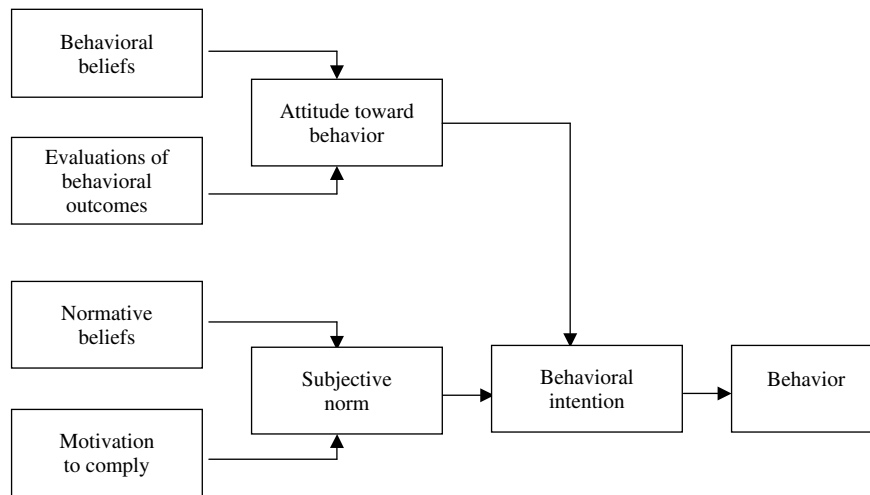


Figure 1. Theory of reasoned action. Adapted from Glanz, Rimer, & Lewis, 2002.

**Table 1. Constructs and definitions of theory of reasoned action (from Glanz, Rimer, & Lewis, 2002)**

Constructs	Definitions
Behavioral belief	Belief that behavioral performance is associated with certain attributes or outcomes
Evaluations of behavioral outcomes	Value attached to a behavioral outcome or attribute
Normative beliefs	Belief about whether each referent approves or disapproves of the behavior
Motivation to comply	Motivation to do what each referent thinks
Attitude toward behavior	Overall evaluation of the behavior
Subjective norm	Belief about whether most people approve or disapprove of the behavior
Behavioral intention	Perceived likelihood of performing the behavior
Behavior	Action that will or will not take place

in various areas of public health including sexual health, drug education, sexual practices, and health care. Sexual health behavior has been explored using the TRA as a framework to predict behavior. Sheeran, Abraham, and Orbell<sup>15</sup> conducted a meta-analysis of 121 studies to determine predictors of condom use. In an effort to increase positive attitudes toward condom use, researchers demonstrated that effective messaging can impact attitudes and norms, which can in turn impact behavioral intentions. In a study of 108 high school students, it was shown that the provision of safe sex educational materials positively affected the attitudes and norms related to safe sex.<sup>16</sup>

Studies have shown that attitudes and subjective norms are a predictor of smoking intentions.<sup>17,18</sup> Perko used the TRA to develop an instrument to predict dietary supplement use among adolescents.<sup>19</sup> This instrument revealed that the use of dietary supplements was predicted by attitudes toward the behavior and subjective norms.<sup>20</sup> Adolescents reported that the normative beliefs of physicians, parents, coaches, athletic trainers, and peers would influence the personal decision to use dietary supplements. In the area of adolescent supplement use, other studies have supported the use of the TRA to predict behavior.<sup>21,22</sup>

The predictive nature of the TRA has been utilized in various areas of health care. Hill, Shriver, and Arnett studied the use of CoQ10 among breast cancer patients.<sup>23</sup> Results suggest that people's intention to use CoQ10 was influenced by both attitude and subjective norms. If a person's attitudes supported the notion that supplement use would improve health, then he or she was more likely to use the supplement. If a person perceived that family, friends, and health care practitioners support CoQ10 use, then the behavior was more likely to occur.<sup>23</sup> In another study related to cancer, Ross and colleagues used the TRA to predict cancer information seeking among African American men.<sup>24</sup> There was a direct relationship between both attitudes of seeking prostate cancer information from physicians and subjective norms to behavioral intentions.

The TRA has been applied to healthcare providers in an attempt to determine intentions of practices. Despite extensive training in multiple domains, healthcare providers may choose practice behaviors based on attitudes, personal beliefs, and/or normative beliefs. Sable and others examined physicians' intentions to prescribe emergency contraception.<sup>25</sup> In a survey of 96 faculty physicians, it was determined

that high intention to prescribe emergency contraception was associated with positive attitudes toward the behavior. It was also shown that high intention to prescribe emergency contraception was associated with the perception that specific colleagues or professional groups support such prescriptions. TRA has also been used in attempts to predict increasing use of hand hygiene among health care providers.<sup>26,27</sup>

The aim of this study was to assess interns' intentions on use of health promotion in practice and identify attitudes and beliefs of graduating interns in a chiropractic college on health promotion along with feelings about how wellness and health promotion education was being delivered. Whether various influences in their education experience would dictate how they would use health promotion in their future practices was also an aim. As a guide to assessment of interns, components of the TRA were chosen as a framing model for development of survey questions.

## METHODS

A survey was designed for use with interns who would be graduating at the end of a semester and institutional review board (IRB) granted approval to administer to all interns graduating in 2007. The sample population was every intern who would graduate that year and surveys were completed at the end of their graduating semester. In accordance with the IRB they were instructed that participation was voluntary and they would remain anonymous. The survey used the TRA as a template for question development including 5-point Likert scale questions centered on various constructs of the TRA model. The theory proposes that behavioral action is determined by intentions, while an individual's intention to perform a behavior is determined by attitude towards the behavior and various normative beliefs. The development of the survey using the TRA led to 20 questions that would assess certain components of TRA and help determine what might influence use of health promotion in practice. These were tested for face validity by 3 chiropractic researchers and one non-chiropractic researcher with a background in biostatistics. Questions were adjusted or changed according to the input from those researchers.

The survey asked interns to consider the CCE definition of health promotion as it appeared in the CCE standard minus a statement that indicated

a treatment component of chiropractic care to the neurobiomechanical aspects of the body was part of prevention. This alteration to the definition provided by the CCE was made as the investigators felt if it were left in; every intern would assume they would perform health promotion even if all they did was treat injuries. Therefore, the altered CCE definition of HP<sup>8</sup> developed for the survey read as, ‘*Health promotion includes general strategies to enhance quality of life, prevent disease, trauma and illness including ergonomics, psychosocial supports, exercise, diet and nutrition including lifestyle counseling and health screening.*’ A complete copy of the survey can be seen as Appendix A. Questions for the survey were based on what all health care providers should do in an optimal, patient-centered practice regarding the most common needs demonstrated by the health literature regarding HP. In addition to those questions constructed dealing with normative beliefs, attitudes and such, questions were included on intention to advise all patients on tobacco use, diet and healthy weight, exercise and psychosocial and stress-related issues and their health.

### Statistical Analyses

Survey data were analyzed using SPSS version 16.0 for Windows (SPSS, Inc. Chicago, IL). Chi squared/Fischer exact tests were used to detect differences in response for each question. The responses to 5-point Likert scale questions were dichotomized as follows: ‘A/SA’ if respondents indicated ‘Agree’ or ‘Strongly Agree’ and ‘D/SD’ if they indicated ‘Neutral’, ‘Disagree’ or ‘Strongly Disagree’. Neutral responses were grouped with negatives as the investigators felt interns either agreed with a concept or didn’t. Binary logistic regression was used to assess the existence of association for various influencing factors with gender, whether interns have skills or will have time and whether they intend to use health promotion in practice. Variables of having time or not, having skills or not, and will or will not use HP as routine in practice were each used as separate outcomes while all categorical predictor variables from the survey were used to build the logistic regression models using forward, stepwise model building. T-tests were used to evaluate differences in mean age between gender and those who A/SA or S/SD with various normative beliefs/intentions/influencing factors.

## RESULTS

Among the interns who graduated in 2007, 90% (n = 255) of interns enrolled in the college at the time completed the entire survey. Of these, 63.8% (n = 163) were male. Proportions mirrored the overall student population there. The mean (standard deviation) age of the interns was 29.0(5.2) years. There was no significant difference between the mean ages of males and females (p = 0.54) or those who A/SA or D/SD to various normative beliefs/intentions/influencing factors (p > 0.05 for all). Females were half as likely as males to say education emphasized HP [OR(95%CI)= 0.5(0.2,0.9)] but more than 3 times as likely to say they intend to use HP as a routine part of practice [OR = 3.6(1.2,10.9)]. Summaries of the responses to each attitude/normative belief/influencing factor/intention survey question (original 5-point Likert scale) and distribution by gender are labeled Tables 2 and 3, respectively.

### Intent to Use HP

Ninety percent of graduating chiropractic interns indicated an intention to use HP as a routine part of practice. Only 76.3% of interns plan to counsel all tobacco users on the benefits of quitting. However, 94.1% and 93.4% of interns plan to advise all patients on healthy exercise levels and healthy weight and diet, respectively. Eighty-seven percent of interns intend to advise patients on psychosocial and stress issues. Interns who believed key influencers approved of HP were nearly 37 times more likely to indicate they intend to use HP as a routine part of practice compared to those who did not believe their key influencers approved of HP [OR = 36.9(13.5,100.9)].

### Non-normative Belief Components

The percentage of interns who believed their education emphasized health promotion as defined in the survey was 86.7%. These interns were at least twice as likely to indicate an intention to counsel tobacco users [OR = 2.3(1.1, 4.8)] and all patients concerning exercise [OR = 9.5(3.2, 28.3)], healthy weight and diet [OR = 9.6(6.4, 27.2)], and psychosocial and stress management [OR = 6.3(2.7, 14.4)]. Only 62.2% thought forms, brochures, and resources in the institution were adequate for HP.

**Table 2. Distribution of responses [n(%)] to questions on attitudes, normative beliefs, influencing factors and intentions of graduating chiropractic interns (N = 255) on routine use of Health Promotion (HP) in future practice (Parker College of Chiropractic 2007)**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Education emphasized HP	2(0.8)	6(2.3)	26(10.1)	116(45.1)	107(41.6)
Proper for DC to use HP	3(1.2)	3(1.2)	8(3.1)	46(17.9)	197(76.7)
Colleagues approve of HP	4(1.6)	5(1.9)	29(11.3)	84(32.7)	135(52.5)
Clinic staff approve of HP	4(1.6)	11(4.3)	60(23.4)	89(34.8)	92(35.9)
Key influencers approve of HP	2(0.8)	2(0.8)	23(9.0)	68(26.7)	160(62.7)
Have skills to use HP	5(2.0)	10(3.9)	38(14.9)	95(37.3)	107(42.0)
State will allow HP	4(1.6)	3(1.2)	25(9.8)	70(27.5)	153(60.0)
Will have time to use HP	3(1.2)	7(2.7)	33(12.9)	91(35.7)	121(47.5)
Will use HP as routine	5(2.0)	3(1.2)	19(7.5)	65(25.6)	162(63.8)
Health care provider's job to do HP	3(1.2)	0(0)	10(3.9)	46(18.0)	196(76.9)
Patients expect HP from DC	6(2.3)	11(4.3)	54(21.0)	75(29.2)	111(43.2)
Intend to counsel all on tobacco	6(2.3)	7(2.7)	48(18.7)	67(26.1)	129(50.2)
Counsel all on exercise	6(2.3)	0(0)	9(3.5)	52(20.2)	190(73.9)
Counsel all on healthy weight/diet	6(2.3)	2(0.8)	9(3.5)	53(20.7)	186(72.7)
Counsel all on psych/stress	7(2.7)	3(1.2)	23(8.9)	65(25.3)	159(61.9)
Forms, brochures, resources adequate	10(3.9)	23(8.9)	64(24.9)	72(28.0)	88(34.2)

Analysis showed 83.2% of graduating chiropractic interns believed they would have time to perform HP in practice. These interns were more likely to A/SA their education or clinic staff emphasized HP and that key influencers and colleagues believe HP is appropriate. The same trends were observed when examining whether or not interns believed they have the skills necessary for HP of which 79.3% believed they possessed. However, analyses of intention to use HP as routine showed the clinical staff emphasis component to be insignificant [OR = 2.1(0.9, 4.7)] in relation to interns believing they possessed the skills necessary for HP. These results are presented in greater detail in Table 4 and Figures 2, 3 and 4.

### Normative Belief Components

Seventy-two percent of chiropractic interns A/SA patients expect HP by a DC and 70.7% A/SA clinic doctors/staff and other academic personnel emphasized use of HP. At least 85% of interns A/SA their colleagues or key influencers of future practice style approve of using HP in practice. Table 2 contains more detailed results.

### Predictor Models: Having Time or Skills and Use of HP as Routine

Logistic regression revealed significant predictors in the model for interns believing they will have time for HP to be clinic staff emphasis [OR = 3.4(1.4, 8.2)], key influencers [OR = 13.4(4.6, 38.8)], and whether or not states would allow HP [OR = 7.3(2.7, 20.0)].

In the model for interns believing they possess the skills necessary for HP, significant predictors were whether or not education emphasized HP [OR = 11.7(4.5, 30.8)], clinic staff emphasis of HP [OR = 4.2(1.9, 9.5)], believing they would have time for HP [OR = 2.7(1.1, 6.8)], and beliefs on whether it was a health care provider's job to perform HP [OR = 10.0(2.0, 50.5)].

A model for predicting who would use HP as routine in practice revealed colleague approval of HP [OR = 13.8(3.4, 56.0)], clinic staff approval of HP [OR = 0.1(0.02, 0.8)], key influencers [OR = 18.1(3.7, 88.8)], whether or not state law will allow HP [OR = 6.0(1.4, 26.7)], and beliefs on whether or not it is a health care provider's job to perform HP [OR = 31.5(3.0, 330.0)] to be significant.

**Table 3. Gender distribution [n(%)], odds ratio (OR; females versus males), and 95% confidence interval (95%CI) of graduating chiropractic interns that Agree or Strongly Agree with attitudes, normative beliefs, influencing factors, and intentions on routine use of Health Promotion (HP) in future practice (Parker College of Chiropractic 2007)**

	Females (n = 93)	Males (n = 164)	OR(95%CI)
Education emphasized HP	75(80.6)	148(90.2)	0.5(0.2, 0.9)
Proper for DC to use HP	89(95.7)	154(93.9)	1.4(0.4, 4.7)
Colleagues approve of HP	83(89.2)	136(82.9)	1.7(0.8, 3.7)
Clinic staff approve of HP	63(67.7)	118(72.4)	0.8(0.5, 1.4)
Key influencers approve of HP	87(94.6)	141(86.5)	2.7(1.0, 7.4)
Have skills to use HP	74(80.4)	128(78.5)	1.1(0.6, 2.1)
State will allow HP	82(89.1)	141(86.5)	1.3(0.6, 2.8)
Will have time to use HP	78(84.8)	134(82.2)	1.2(0.6, 2.4)
Will use HP as routine	88(95.7)	139(85.8)	3.6(1.2, 10.9)
Health care provider's job to do HP	88(95.7)	154(94.5)	1.3(0.4, 4.3)
Patients expect HP from DC	68(73.1)	118(72.0)	1.0(0.6, 1.9)
Intend to counsel all on tobacco	74(79.6)	122(74.4)	1.3(0.7, 2.5)
Counsel all on exercise	86(92.5)	156(95.1)	0.6(0.2, 1.8)
Counsel all on healthy weight/diet	84(90.3)	155(95.1)	0.5(0.2, 1.3)
Counsel all on psych/stress	83(89.2)	141(86.0)	1.4(0.6, 3.0)
Forms, brochures, resources adequate	56(60.2)	104(63.4)	0.9(0.5, 1.5)

**Table 4. Odds ratio and 95% confidence interval (A/SA versus D/SD)\* for attitudes, normative beliefs, and influencing factors of graduating chiropractic interns who have time for Health Promotion (HP), have skills for HP, or intend to use HP**

	Have time for HP	Have skills for HP	Intend to use HP
Education emphasized HP	5.4(2.5, 12.0)	19.0(8.1, 45.2)	7.5(3.1, 18.0)
Proper for DC to use HP	24.0(6.3, 91.0)	12.0(3.4, 38.4)	32.8(9.3, 115.6)
Colleagues approve of HP	11.0(5.0, 23.8)	4.7(2.3, 9.7)	20.7(8.2, 52.1)
Clinic staff approve of HP	6.5(3.2, 13.3)	7.0(3.6, 13.5)	2.1(0.9, 4.7)
Key influencers approve of HP	25.5(9.7, 66.7)	7.5(3.2, 17.5)	36.9(13.5, 100.9)
State will allow HP	14.5(6.3, 33.4)	11.4(5.0, 25.9)	11.3(4.7, 27.0)
Will have time to use HP	-	8.0(3.9, 16.3)	3.7(1.6, 8.6)
Health care provider's job to do HP	13.8(4.0, 47.2)	15.4(4.0, 58.4)	77.3(15.8, 379.2)
Patients expect HP from DC	2.8(1.4, 5.4)	3.7(2.0, 7.0)	3.2(1.5, 7.4)

\* A/SA = Agree or Strongly Agree, D/SD = Neutral, Disagree, or Strongly Disagree

## DISCUSSION

The goal of this study was to see what graduating interns at one college intended to do in practice regarding the use of health promotion. We also wanted to see if there was influence from several sources on campus on their attitudes and beliefs including those normative constructs like what colleagues, staff doctors or personnel thought, and even those they felt were key influencers

regarding intended use of health promotion in practice. While whether they thought education emphasized HP and other factors like skills and state laws have influence on interns' beliefs, the majority in each category said they intended to use HP in practice and to counsel patients. We found this gratifying. In addition, we thought it was interesting that in this case, those normative issues in interns' surroundings did indeed predict how they might behave. It was difficult to explain an inverse relationship regarding

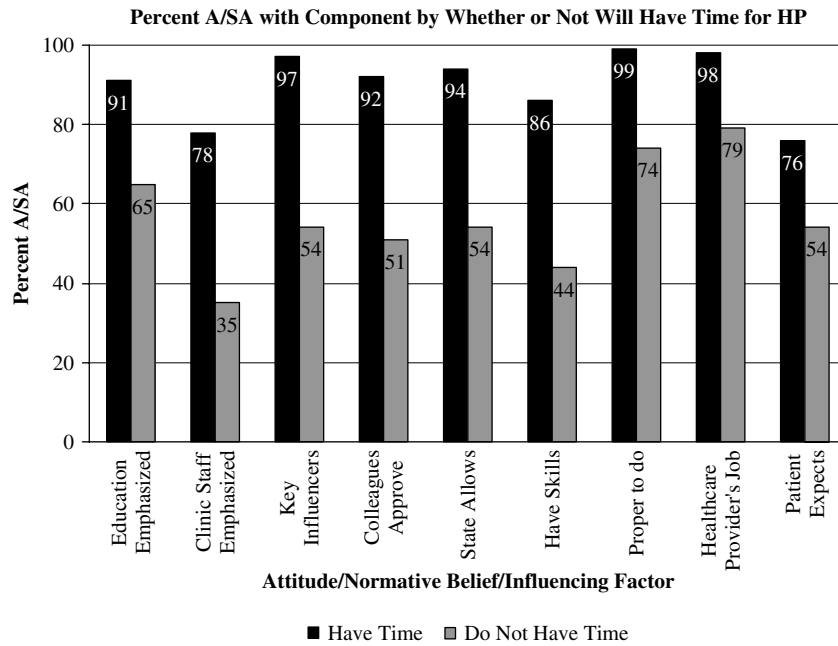


Figure 2. Distribution (percent agree/strongly agree [A/SA]) of attitudes, normative beliefs, and influencing factors of graduating chiropractic interns grouped by whether or not they believe they will have time for Health Promotion (HP).

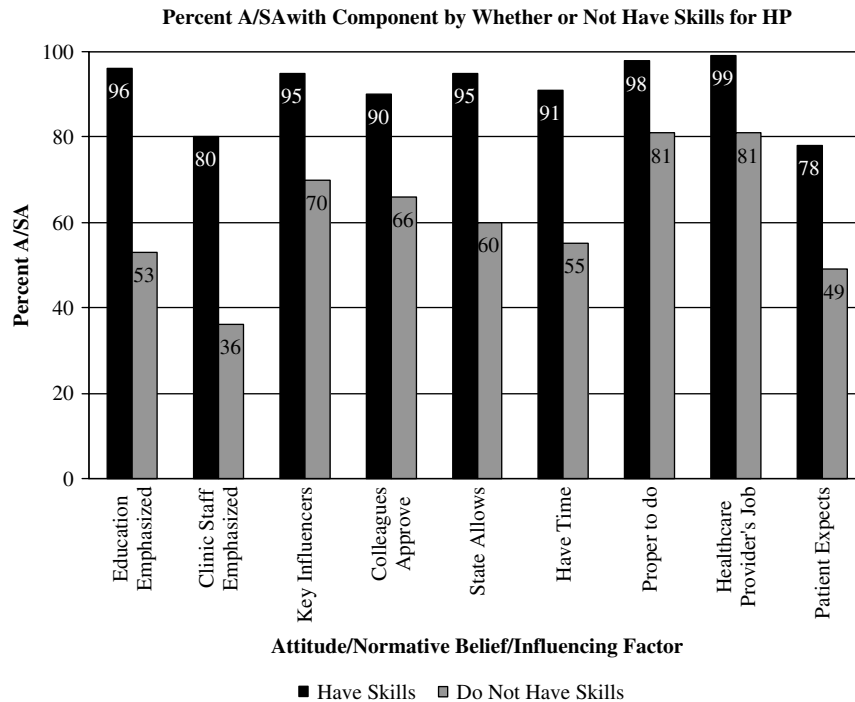


Figure 3. Distribution (percent agree/strongly agree [A/SA]) of attitudes, normative beliefs, and influencing factors of graduating chiropractic interns grouped by whether or not they believe they have the skills necessary to do Health Promotion (HP).

clinic staff approval of health promotion and this needs further investigation. Nevertheless, colleagues,

key influencers of future practice style, and perceptions of having time all factor in and do so as much

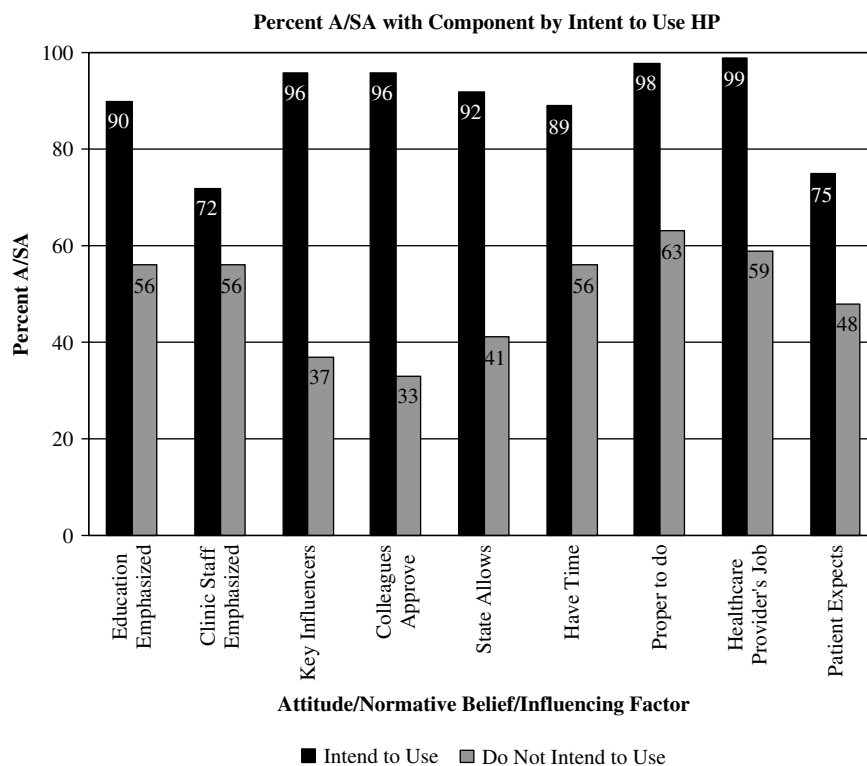


Figure 4. Distribution (percent agree/strongly agree [A/SA]) of attitudes, normative beliefs, and influencing factors of graduating chiropractic interns grouped by whether or not they intend to do Health Promotion (HP).

as whether education at the college emphasized the use of health promotion, perceived skills to perform HP, or if their future state in which they will practice will allow it.

### Future Chiropractors and Health Promotion

Yarnall and others<sup>28</sup> reported that physicians perceive they do not have time to do health promotion and prevention in practice and this is something that some in our sample indicated as significant barriers to the use of health promotion as well. Unfortunately, this perception is probably not accurate. With a family physician who may only see a patient a couple of times a year it could be difficult to sustain health promoting messages but for the DC, due to the nature of manual therapy and a schedule requiring a patient to be seen several times in the first few weeks, there is a tremendous opportunity for dose-response delivery of health promotion messages. Education should emphasize that they do have time and that they are a powerful cue to patients on taking action.

While we know that colleagues can provide negative or positive peer influences we found it intriguing that those key influencers of future practice style had such a significant impact on what they might do in practice. Unfortunately, we don't really know who those key influencers may be or how motivated one may be to comply as we didn't attempt to measure this in the survey. Theoretically, they could be supervising clinicians at the college, parents if they are health care providers, colleagues they look up to or even a practice management guru that they have attended a seminar by in their formative years as a chiropractic student. Future work could identify what chiropractic interns might consider a key influencer when it comes to future practice style.

### Significance of the Study for Chiropractic Education

This was a study of only one teaching institution in the US but it did sample 90% of graduating interns for one entire year. Some cell sizes were small when logistic regression modeling was employed as we tried to separate various categories.

This limited the ability to gain clinical significance from some of the tests. Where we could glean information from testing, among the significant issues regarding education of chiropractors is who the intern is exposed to and at what stage in their formative education. At some point, key influencers of future practice style have a bearing on what some interns intend to do in practice regarding health promotion. Do didactic professors promote use of health promotion and clinicians back this up? It appears that they do but perhaps to a lesser degree than they should as a vast majority believed overall education emphasized HP but fewer thought forms, brochures, and resources were adequate or that clinical staff in outpatient clinics emphasized use of health promotion. A “do what I say, not what I do” mentality could be problematic. If didactically they are taught to perform prevention and health promotion but clinicians say, “You will not have time,” this could be an issue in need of addressing. Future research could determine this.

Finally, we found it of interest that most interns have no problem with counseling patients on healthy exercise levels but when it comes to advising smokers and those who may have psychosocial and stress-related disorders, the numbers, though still a majority stating intent to perform some HP, dropped 20–30%. Smoking for instance is among the most associated behaviors with chronic spine disease and a significant risk factor for problematic treatment of spine patients.<sup>2,4,29,30</sup> It is also the most preventable cause of death. In addition, psychosocial comorbidities are significantly associated with chronic pain and chronic spine patients.<sup>3</sup> These findings still may reflect gaps in chiropractic education regarding comorbid conditions and spine disease and in links to health promotion and the need for counseling spine patients specifically in these areas. Our inclination is that this is the case. After all, how can one claim to be a specialist in an area of health care if part of what they do does not adequately address prevention of the specific conditions they treat?

Our study is a small study with a minority of interns stating they would use no health promotion measures in practice. This could indicate examiner bias in that they performed the survey upon exiting their clinical experience but prior to graduation. Smaller numbers in this area skewed our Likert responses right and made for some wide confidence intervals making practical significance at times, difficult to pin down. Larger samples would add power

and multiple campuses would yield better generalizability.

## CONCLUSION

The chiropractic profession has an opportunity to better teach and better participate in the use of prevention and health promotion in practice. They can reach a large number of people through the dose-response relationship mentioned earlier. The choice to do so may hinge on their perceived education in health promotion, perceived attitudes and wishes of significant others, and their motivation to comply with them or new standards that suggest they learn and practice HP methodologies as a matter of routine practice patterns. This study implies a majority of interns at one institution intend to use health promotion practices in their future practices. A better understanding of profession-wide patterns regarding preventive medicine and health promotion, including specifically what is being done is certainly needed and future investigations should follow.

## CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

Funding for this study was provided by Parker College of Chiropractic’s Research Institute.

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**Received June 29, 2008**

**Revised July 15, 2008**

**Accepted August 12, 2008**

**Address correspondence to:** Marion W. Evans, Jr. DC, PhD, CHES, Director of Health Promotion Degree Programs, Cleveland Chiropractic College, 10850 Lowell Avenue, Overland Park, KS 66210, will.evans@cleveland.edu, ph: 913-234-0646, fax: 913-234-0910.

## REFERENCES

1. Christensen MG, Kollasch MW. Job Analysis of Chiropractic: A project report, survey analysis and summary of the practice of chiropractic within the United States - 2005. Greeley: National Board of Chiropractic Examiners; 2005.
2. Fanuele JC, Birkmeyer NJO, Abdu WA, Tosteson T, Weinstein JN. The impact of spinal problems on the health status of patients: have we underestimated the effect? *Spine* 2000;25:1509–14.
3. Von Korff M, Crane P, Lane et al. Chronic spinal pain and physical-mental comorbidity in the United States:

- results from the national comorbidity survey replication. *Pain* 2005;113:331–9.
4. Jhawar BS, Fuchs CS, Colditz, GA, Stampfer MJ. Cardiovascular risk factors for physician-diagnosed lumbar disc herniation. *Spine J* 2006;6:684–91.
  5. Institute of Medicine. Crossing the quality chasm: a new health system for the 21<sup>st</sup> century. Washington, DC: National Academies Press; 2001.
  6. U.S. Department of Health and Human Services. Healthy People 2010: understanding and improving health. 2<sup>nd</sup> Ed. Washington, DC: US Government Printing Office; Nov 2000.
  7. Manson JE, Skerrett PJ, Greenland P, VanItallie TB. The escalating pandemics of obesity and sedentary lifestyle. *Arch Intern Med* 2004 164:249–58.
  8. Council on Chiropractic Education. Standards for Doctor of Chiropractic Programs and Requirements for Institutional Status, January 2006. Scottsdale: The Council on Chiropractic Education; 2006. p. 45–7.
  9. Evans M, Rupert R. The Council on Chiropractic Education's new wellness standard: a call to action for the chiropractic profession. *Chiropr Osteopat* 2006;14:23.
  10. Hawk C, Rupert RL, Hyland JK, Odhwani A. Implementation of a course on wellness concepts into a chiropractic college curriculum. *J Manipulative Physiol Ther* 2005;28:423–8.
  11. Fishbein M. Readings in attitude theory and measurement. New York,: Wiley; 1967.
  12. Fishbein M, Ajzen I. Belief, attitude, intention and behavior. An introduction to theory and research. Reading: Addison-Wesley Publishing Company; 1975.
  13. Ajzen I, Fishbein M. Understanding attitudes and predicting social behavior. Englewood Cliffs: Prentice-Hall, Inc; 1980.
  14. Glanz K Rimer B Lewis F. Health behavior and health education: theory, research and practice. San Francisco: Jossey-Bass; 2002.
  15. Sheeran P, Abraham C, Orbell S. Psychosocial correlates of heterosexual condom use: a meta-analysis. *Psychol Bull* 1999;125:90–132.
  16. Carnaghi A, Cadinu M, Castelli L, Kiesner J, Bragantini C. The best way to tell youth to use a condom: the interplay between message format and individuals' level of need for cognition. *AIDS Care* 2007;19:432–40.
  17. Hanson M. An examination of ethnic differences in cigarette smoking intention among female teenagers. *J Am Acad Nurse Pract* 2005;17:149–55.
  18. McMillan B, Higgins A, Conner M. Using an extended theory of planned behavior to understand smoking amongst school children. *Addict Res Theory* 2005; 13(3): 293–306.
  19. Perko M. Development of a theory based instrument regarding adolescent athletes and dietary supplements. *Am J Health Studies* 1999;15:71–86.
  20. Perko M, Bartee T, Dunn M, Wang M, Eddy J. Giving new meaning to the term "taking one for the team:" Influences on the use/nonuse of dietary supplements among adolescent athletes. *Am J Health Studies* 2000;16: 99–106.
  21. Dunn M, Eddy J, Wang M, Nagy S, Perko M, Bartee R. The influence of significant others on attitudes, subjective norms, and intentions regarding dietary supplement use among adolescent athletes. *Adolescence* 2001;36: 583–91.
  22. Godo J, Graves B, O'Kroy J, Hecht S. Influences of dietary supplement use in south Florida adolescent athletes. *Am J Health Studies* 2006;21:91–8.
  23. Hill, G., Shriver, B., and Arnett, D. Examining intentions to use CoQ10 among breast cancer patients. *Am J Health Behavior* 2006;30:313–21.
  24. Ross L, Kohler C, Grimley D, Anderson-Lewis C. The Theory of Reasoned Action and intention to seek cancer information. *Am J Health Behavior* 2007;31:123–34.
  25. Sable M, Schwartz L, Kelly P, Lisbon E, Hall M. Using the Theory of Reasoned Action to explain physician intention to prescribe emergency contraception. *Perspect Sexual Reproduc Health* 2006;38:20–7.
  26. Sax H, Uckay I, Ricket H, Allegranzi B, Pittet D. Determinants of good adherence to hand hygiene among health care workers who have extensive exposure to hand hygiene campaigns. *Infect Control Hosp Epidemiol* 2007;28:1267–74.
  27. O'Boyle CA, Henly SJ, Larson E. Understanding adherence to hand hygiene recommendations: the theory of planned behavior. *Am J Infect Control* 2001;29:352–60.
  28. Yarnall KSH, Pollak KI, ?stbye T, Krause KM, Michener JL. Primary care: is there enough time for prevention? *Am J Public Health* 2003;93:635–641.
  29. Scott SC, Goldberg MS, Mayo NE, Stock SR, Poitras B. The association between cigarette smoking and back pain in adults. *Spine* 1999;24:1090–8.
  30. Rechtime GR, Frawley W, Castellvi A, Gowski A, Chrin AM. Effect of the spine practitioner on patient smoking status. *Spine* 2000;25:2229–33.

## APPENDIX A. HEALTH PROMOTION SURVEY USED IN THIS STUDY

**This survey is intended to evaluate how you feel about certain aspects of your training as it pertains to wellness and health promotion and its use in chiropractic practice. For purposes of this survey, health promotion includes general strategies to enhance quality of life, prevent disease, trauma and illness including ergonomics, psychosocial supports, exercise, diet and nutrition including lifestyle counseling and health screening. Please respond to the question or circle the most appropriate number.**

1. What is the month and year you will graduate?

2. My education at Parker emphasized the role of the doctor of chiropractic in promoting health and wellness with their patients as described in the definition above.

Strongly Disagree    Neutral    Strongly Agree  
1                      2    3    4                      5

3. Regarding the chiropractor's role in health promotion, (as described above) I feel it is proper for me to offer health promotion information and counseling to patients.

Strongly Disagree    Neutral    Strongly Agree  
1                      2    3    4                      5

4. Regarding health promotion, (as described above) I believe my colleagues approve of the use of health promotion information and counseling with patients as part of chiropractic practice.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

5. Regarding my experience in the outpatient clinics at Parker, I feel the use of health promotion (as described above) was emphasized by Clinic Doctors and other academic/clinic personnel.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

***Health Promotion and Wellness Intern Exit Survey continued***

6. Regarding people I consider key influences on my future practice style; I feel they approve of the use of health promotion, (as described above) in chiropractic practice.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

7. Regarding the skills I have been taught in my chiropractic education I feel I have received the necessary skills to use health promotion (as described above) once I get into practice.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

8. I believe the state laws in the state I plan to practice in will allow for me to use health promotion (as described above) with patients.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

9. Once in practice, I feel I will have adequate time to deliver health promotion information and services (as described above) to patients.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

10. As I begin my chiropractic practice, I intend to use health promotion (as described above) as part of my routine practice procedures.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

11. I believe it is every health care provider's job, including mine, to deliver health promotion messages (as described above) and education to patients.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

***Health Promotion and Wellness Intern Exit Survey continued***

12. I believe patients expect chiropractors to be a source of health promotion information (as described above) when seeking chiropractic care.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

13. I plan on counseling all tobacco users on the benefits of quitting.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

14. I plan on counseling all patients on healthy exercise levels.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

15. I plan on counseling all patients on healthy weight and diet.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

16. I plan on counseling all patients on psychosocial health and stress management.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

17. Based on the definition of health promotion above, I feel Parker has adequate forms, brochures and resources available for delivery of health messages to patients.

Strongly Disagree    Neutral    Strongly Agree  
1                    2    3    4                    5

18. Are you Male Female?

19. What is your age?

20. If you have determined what state you will practice in, please list it here.