0008-3194/90/69–74/$2.00/©JCCA 1990

# Lifestyle analysis: a comparative study between freshman, second and fourth year chiropractic students*

Philip A Decina, DC**
Marion McGregor, BSc, DC, FCCS(C), MSc***
Carol Hagino, BSc, MBA****

*This study set out to determine whether healthy lifestyle attitudes are different for students in different years of the chiropractic education process. The results of the FANTASTIC Lifestyle Assessment Questionnaire administered to chiropractic students enrolled in first, second and fourth years of study are presented. Significant differences in scores attained were found between the three years of study in question. A minimum sample size (N) of 81 students was used. First year subjects were significantly different from both second year and fourth year subjects' scores ($p = .012$ and $p < 0.001$, respectively). Mean scores decreased with every year of study. The variables 'year of study' and 'age' had the most pronounced effect on outcome of scores ($p < 0.001$ and $p < 0.001$, respectively). Analyses of variance were performed to determine effect of the variables involved. A two-tailed paired t-test was used to check first year students for changes after six months of school. It is still undetermined whether the significant difference in scores between each year of study are due to the year of study, to increasing average age of the classes, or to societal attitudes about wellness. Suggestions for future study are also presented.*
(JCCA 1990; 34(2): 69–74)

KEY WORDS: Chiropractic, education, lifestyle, assessment, manipulation.

*Cette étude veut déterminer si les attitudes de style de vie saine sont différentes pour les étudiants des diverses années du processus d'éducation chiropratique. Les résultats du questionnaire d'évaluation du style de vie FANTASTIC, tel qu'administré aux étudiants en chiropratique de première, deuxième et quatrième année, sont présentés. Des différences significatives dans les scores atteints ont été trouvées entre les trois années d'études en question. Un échantillon minimal (N) de 81 étudiants fut utilisé. Le score des sujets de première année était significativement différent de ceux des sujets de deuxième et quatrième année ($p = 0{,}012$ et $p < 0{,}001$ respectivement). Les scores moyens diminuaient avec chaque année d'études. Les variables "année d'études" et "âge" ont eu l'effet le plus prononcé sur le résultat des scores ($p < 0{,}001$ et $p < 0{,}001$ respectivement). Des analyses de variance furent conduites pour déterminer l'effet des variables impliquées. Un test-T bilatéral fut utilisé pour vérifier les changements chez les étudiants de première année après six mois de cours. Il reste à déterminer si les différences signicatives des scores entre chaque année d'études sont dues à l'année d'études, à l'augmentation de la moyenne d'âge des classes, ou aux attitudes de la société face au mieux-vivre. Des suggestions pour des études futures sont également présentées.*
(JCCA 1990; 34(2): 69–74)

MOTS-CLÉS: Chiropratique, éducation, styles de vie, évaluation, manipulation.

## Introduction

In recent years, both the Canadian and American departments of Health and Welfare have realized that a change in orientation of the healthcare system is needed. As opposed to a model based on treating disease, they have tried to promote a model based on health and disease prevention. The betterment of lifestyle is a very important factor in achieving an improved level of health. An unhealthy lifestyle can create self-imposed risks, which may result in a decreased quality of life, avoidable illnesses and even premature death.[1] Wilson and Ciliska state that lifestyle is thought to consist of an individual's decisions which affect his health. They reference the American report, "Healthy People: The Surgeon-General's Report of Health Promotion and Disease Prevention", who have specifically linked lifestyle and disease.[1] Governments are also interested in disease and disability prevention, since the costs of healthcare for the increasing aging population (45–54 years) are projected to double between the years 1981–2011 (Statistics Canada, 1986).

* In partial fulfillment of graduation requirements, CMCC.
** Resident 1, CMCC.
*** CMCC, Toronto, Ontario.
**** Research Administrator, CMCC, Toronto, Ontario.
Correspondence and reprint requests to: Philip A Decina, DC, Canadian Memorial Chiropractic College, 1900 Bayview Avenue, Toronto, Ontario M4G 3E6, (416) 482-2340.

The model based on health promotion and disease prevention is one which the chiropractic profession has endorsed from its very beginnings. Idealy as advocates of this model, chiropractors should be setting an example. It would seem reasonable to conclude, that as chiropractic students learn more about the lifestyles they will be teaching their patients, they themselves will improve their own. This paper will examine the hypothesis that healthy student lifestyles change between first and fourth year of study.

Many studies have been done on medical and nursing students, assessing such things as the impact of medical school on student interpersonal relationships and lifestyles,[2] student stress,[3] change in Type A behaviour,[4] effect of marital status on stress,[5] stress-related illness and its sources,[6] developmental and dysfunctional stresses,[7,8] impaired quality of life as a risk factor in cardiovascular disease,[9] and changes in lifestyle characteristics, health and moods,[10] to mention a few. Medical education is commonly considered an intense academic and clinical training program. It has been found that medical education is completed in far from an optimal state of health and may in fact, be hazardous to the health of many students.[10]

These investigations have uncovered some disturbing results with respect to changes in lifestyle characteristics. Research on medical and nursing students[3,4] has shown, that although changes in Type A behaviour (considered to be an independent risk factor for coronary heart disease[11]) decrease between the first and second year of study, a significant increase occurs during the third and fourth clinical years with a peak in the fourth year, as the students' professional responsibilities increase.

A study involving medical freshmen revealed that they considered themselves less physically active (i.e. less aerobic exercise), ate fewer well-balanced meals, slept fewer hours per night, perceived an increase in stress (although stress coping effectiveness increased), spent fewer hours on leisure activities and experienced a decrease in general health. The majority of students believed the greatest changes occurred in the area of psychological/emotional health.[10,12,13] Other studies indicate that martial status is important in dealing with the stress of medical school. They found the married student better equipped to withstand the rigors of training due to emotional support from the spouse (i.e. protection/support hypothesis), whereas the unmarried student does not have such an outlet. Results on lifestyle-influencing factors such as smoking, alcohol use, body build, driving habits, social support and use of the birth control pill are inconclusive according to some studies[10], are a major influence according to others.[5]

Despite screening procedures prior to admission to medical school, emotional impairment among medical students and physicians is high. In the United States, the suicide rate is reportedly 1.5–2.5 times higher for male physicians and 4 times higher for female physicians when compared to the general population. This equates to one graduating medical class committing suicide annually. Thereby clearly supporting Coombs' and Fawzy's assertion that a medical career seems to be an emotionally hazardous undertaking[5].

It is ironic that the medical profession, which strives to provide healthcare, may actually be creating health problems for its prospective practitioners. Very little is available in the current literature relating to such problems in chiropractic education. Therefore, the purpose of this study is to determine whether the lifestyles of chiropractic students follows a similar pattern.

## Materials and methods

In order to determine whether lifestyle changes are occurring in chiropractic students, a questionnaire was needed which incorporates the aforementioned variables, yet is valid and reliable. A questionnaire which closely met the criteria was Wilson's FANTASTIC Lifestyle Assessment Questionnaire[14] (see Appendix 1). The questionnaire includes the physical, emotional and social components of health believed to be relevant to morbidity, mortality and quality of life.[1,15] It consists of 25 questions encompassing Family and Friends, Activity, Nutrition, Tobacco and Toxins, Alcohol, Sleep/Seatbelts and Stress, Type of Personality, Insight, and Career. The FANTASTIC Lifestyle Assessment was found to be a reliable, quick and simple method for people to assess lifestyle behaviours.[16] A retest reliability study revealed a correlation coefficient of total scores to be 0.88,[1,17] A separate study revealed no conclusions regarding its validity and further testing to determine validity was recommended.[18] However, since the questions are relevant and based on everyday life and it includes only behaviours which can be controlled, face validity is apparent.

Strengths of the FANTASTIC Lifestyle Assessment are many: as a single page, it can be completed quickly, the components are easily remembered, it can be used for self-assessment, and component and total scores are reference points for ongoing assessment.[19] Results are available immediately making it a time-saving method of incorporating lifestyle data into one visit for the patient's health record.[1]

For this present study, a minimal sample size of eighty-one (81) subjects from each year of study was chosen. Sample size estimation was based on clinical effect size from another study,[4] and calculation suggested by Cohen.[20]

The questionnaire was administered to the fourth year class at the end of a summer term examination so as to ensure the required sample size. The questionnaire was collected immediately after the examination. All 25 questions and demographic data had to be answered in order for the questionnaire to be considered usable. Freshman and second year classes received and completed the questionnaire in the second week of the fall term. The questionnaire was administered within the first ten minutes of class. The freshman class was re-tested in the second week of the winter term (January 1989), that is 6 months later. All groups were given the same instructions upon administration. Student ID numbers as opposed to names were used to identify subjects while maintaining confidentiality. All

FANTASTIC questionnaire scores were tallied by the examiner so as to avoid subject (student) bias. That is to say, if the scoring format had been left on the questionnaire for subjects to count up their own score, they may have answered questions differently if they could see how many points each question was worth. A score ranging from 0–100 was obtained. Higher scores were considered more desirable.

The third year class was not examined because a possible difference between first and fourth years of study was the main area of interest. The first year class was tested twice (6 months apart) to determine how quickly any changes in healthy attitudes might occur.

An analysis of variance was performed to compare freshman, second and fourth year student scores. Variables such as age, sex and marital status were initially included to see if any differences were significant with respect to the scores attained. A two-tailed paired samples t-test was used to determine whether a significant difference existed between freshman student scores attained in the first month of school and the ones attained six months later.

## Results

Tables 1, 2 and 3 display demographic data of the complier population. The frequency of distribution of the marital status categories, sex, and ages are given. 'Compliers' were defined as students who completed all 25 questions and demographic data. For first year students, the ID number was also mandatory for classification as 'complier' since re-test of the same individuals was needed at a later date. 'Non-compliers' were defined as students who did not successfully complete the questionnaire.

**TABLE 1.** Frequency Distribution of Marital Status of Respondents by Year of Study

| Year of Study | Single | Married | Separated | Divorced | Widowed | Total |
|---|---|---|---|---|---|---|
| first | 72 | 12 | 0 | 2 | 0 | 86 |
| second | 88 | 32 | 1 | 2 | 0 | 123 |
| fourth | 77 | 29 | 2 | 1 | 0 | 109 |

**TABLE 2.** Distribution of Age of Compliers by Gender and Year of Study

| Year of Study | Gender | Number (N) | Mean | Std. Dev. | Overall Mean Age | Overall Std. Dev. |
|---|---|---|---|---|---|---|
| first | M | 54 | 24.17 | 3.86 | 24.17 | 3.92 |
| | F | 32 | 24.19 | 4.08 | | |
| second | M | 86 | 25.49 | 3.31 | 25.38 | 3.35 |
| | F | 37 | 25.13 | 3.46 | | |
| fourth | M | 80 | 27.97 | 4.41 | 27.50 | 4.24 |
| | F | 29 | 26.21 | 3.51 | | |

**TABLE 3.** Distribution of Test Scores of Compliers by Gender – Test 1 Only

| Year of Study | Gender | Number (N) | Minimum Score | Maximum Score | Mean | Std. Dev. |
|---|---|---|---|---|---|---|
| first *(Test 1)* | M | 54 | 64 | 94 | 78.80 | 7.43 |
| | F | 32 | 66 | 95 | 81.28 | 8.52 |
| second | M | 86 | 56 | 93 | 76.34 | 7.61 |
| | F | 37 | 64 | 92 | 78.40 | 6.80 |
| fourth | M | 80 | 51 | 94 | 74.95 | 7.93 |
| | F | 29 | 55 | 89 | 73.72 | 8.50 |

Table 4 displays scores obtained for first year compliers and their subsequent six month re-test scores (i.e. Test 1 and Test 2 scores). A two-tailed paired t-test on the scores of these revealed no significant difference between scores obtained on the first testing and scores obtained on the second testing six months later ($t = 0.700$, $df = 85$, $p > .05$).

Table 5 displays scores of first year non-compliers (N.C.) for test 1 and test 2 (57 N.C. in first testing, 41 N.C. in second testing). Because these subjects did not report their student identification numbers, it was impossible to compare individual students directly. The overall means of the compliers and non-compliers for both test 1 and 2 were compared. Analysis of test 1 scores revealed no significant difference between these two groups ($t = 1.547$, $df = 141$, $p > .05$). The same analysis was performed for test 2 and again no significant difference was found ($t = 1.147$, $df = 114$, $p > .05$).

Two cases on non-compliers were observed in both second and fourth year subjects. As they were not considered outliers further analysis was not pursued.

An analysis of variance (ANOVA) was carried out on the complier group using the variables: year of study, age, sex, and marital status. 'Year of study' was significant as a determinant of score attained on the questionnaire ($p < 0.001$). Upon contrasting the different years of study, it was determined that scores obtained by the first year subjects were significantly different from the both second and fourth year scores ($p = .012$ and $p < 0.001$ respectively). Contrasting second and fourth year student scores also demonstrated a significant difference between these two groups ($p = 0.023$). Mean scores attained on the FANTASTIC Lifestyle Questionnaire progressively decreased from first to second, to fourth year of study (see Table 4). Neither sex nor marital status were significantly related to the outcome. An ANOVA including 'age' indicated that this variable was statistically important ($p < 0.001$). Contrasting the years of study, even the smallest age difference (i.e. between the first and second years) was noted to be significant ($p < 0.05$).

## Discussion

Improving lifestyle habits is a very important factor in achieving good health and reducing health risks. It is believed that a specific link exists between lifestyle and disease.[1] Is the chiropractic education process, like the medical education process, contributing to the development of health problems for prospective practitioners? This investigation revealed that a significant difference in assessed lifestyle attained on the FANTASTIC Questionnaire exists between all three years examined. The complete picture as to why the differences occurred however, still involves some speculation.

The mean group scores decreased progressively between students in first, second and fourth year of study. Testing the fourth year class at the end of the term examination may have influenced the perceived stress of the subjects. This possible bias could not be measured and determination of its effects will require further investigation. It is noteworthy, however, that the mean score for all years examined fell into the low health risk category (i.e. 74–84) of the WELL-ILL continuum.[14] This is similar to the general population and suggests that the stress at the time of testing may not have played an important role. One might expect that healthcare practitioners would fall into a better health risk category (i.e. 'Very Low Risk' or 'Optimal Health') as compared to the average person in the general population. It is also possible that knowledge of the benefits of proper nutrition, exercise and preventative healthcare would help make the healthcare practitioner a prime role model for his patients. This was clearly not found.

**TABLE 4.** Overall Distribution of Complier Test Scores Including Test 2

| | TEST 1 | | | TEST 2 – First Year Only | | |
|---|---|---|---|---|---|---|
| Year of Study | Number (N) | Mean | Std. Dev. | Number (N) | Mean | Std. Dev. |
| first | 86 | 79.72 | 7.90 | 86 | 80.23 | 7.96 |
| second | 123 | 76.96 | 7.41 | | | |
| fourth | 109 | 74.62 | 8.06 | | | |

**TABLE 5.** Distribution of First Year Non-Complier Test Scores

| | TEST 1 | | | | | TEST 2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year of Study | Number (N) | Min. Score | Max. Score | Mean | Std. Dev. | Number (N) | Min. Score | Max. Score | Mean | Std. Dev. |
| first | 57 | 58 | 95 | 77.63 | 7.92 | 41 | 25 | 95 | 77.93 | 12.89 |

There was no significant difference between the scores of first year subjects obtained at the start of their school year and scores obtained six months later (indicating good test-retest reliability). A possible reason for this may be that the students' exposure to the chiropractic education process may not have been long enough at this point to detect any noticeable change in health attitudes.

As stated above, 'year of study' proved to be a very significant determinant of score attained and this is what our study hoped to determine. However, 'age' was also found to be a significant determinant of score attained and thus cannot be ignored as a possible reason for the decline in mean score value between first and fourth year of study. In fact, it was found to have a stronger association with the test variable. From this, arise other questions to be answered:

1 did the scores significantly differ due to the higher year of study? i.e. greater workload, more responsibilities and therefore less time devoted to exercise, relaxation etc.;
2 did the scores significantly differ due to the students' increasing age?; or
3 was the difference due to a subtle change in society's attitudes toward wellness such that the current first year students have a better attitude toward wellness than the current fourth year class?

Obviously further testing is required to answer the above questions. In order to answer the second question of whether the scores differed due to the students' increasing age, students within the same age category should be compared across the different years of study.

Other variables were also analyzed for their effect on the test variable. Marital status and sex were shown to have no bearing on scores attained on the questionnaire. This result does not support the protection/support hypothesis of another study,[5] that claimed married students are better equipped to deal with the rigors of professional education because they have a supportive spouse, whereas the unmarried students have no such outlet.

## Conclusion

In conclusion, it is clear that this preliminary investigation has found differences in lifestyle attitudes in chiropractic students at different levels of training. These differences lead to provocative questions regarding the ability of future healthcare professionals to withstand the stresses of their learning environment and the confounding influence of their increasing age. Some results have not borne out the conclusions of other authors regarding additional important variables.[2,5] Further study is recommended, specifically to sort out the age/level of training relationship.

## Acknowledgements

The authors would like to acknowledge the assistance of the Classes of 1989, 1991 and 1992 of the CMCC for participating in this study. We would also like to thank Dr. D. Wilson of the Department of Family Medicine, McMaster University, for his permission to use the FANTASTIC Lifestyle Assessment Questionnaire. Many thanks to Miss Joanne Decina for her time spent in the typing and correcting of the text. Financial assistance for this study was provided by the Department of Research, CMCC.

## References

1 Wilson DMC, Ciliska D. Lifestyle assessment: development and use of the FANTASTIC checklist. Can Fam Phys 1984; 30: 1527–1532.
2 Green SA, Miyai K. The impact of medical school on the student with respect to interpersonal relationships and lifestyles. J Med Educ 1986; 61: 177–178.
3 Booker B., Rouhiainen V. Student stress – a pilot study comparing stress in nursing students undertaking hospital-based and tertiary college basic nursing programmes. Aust Nur J 1981; 10: 41–43.
4 Wolf TM, Kissling GE, Burgess LA. Change in type A behaviour among medical students: a 4-year longitudinal study. Med Educ 1980; 20: 176–180.
5 Coombs RH, Fawzy FI. The effect of marital status on stress in medical school. Am J Psych 1982; 139: 1490–1493.
6 Sekas G, Wile MZ. Stress-related illness and sources of stress: comparing MD-PhD, MD, and PhD. students. J Med Educ 1980; 55: 440–446.
7 Gaensbauer TJ, Mizner GL. Developmental stresses in medical education. Psychiatry 1980; 43: 60–70.
8 Huebner LA, Royer JA, Moore J. The assessment of remediation of dysfunction stress in medical school. J Med Educ 1981; 56: 547–558.
9 Siegrist J. Impaired quality of life as a risk factor in cardiovascular disease. J Chron Dis 1987; 40: 571–578.
10 Wolf TM, Kissling GE. Changes in life-style characteristics, health, and mood of freshman medical students. J Med Educ 1984; 59: 806–814.
11 Wolf TM, Kissling GE. Type A behavior and achievement of freshman medical students. J Med Educ 1983; 58: 820–822.
12 Kutcher SP. Coping with stresses of medical education. Can Med Assoc J 1984; 130: 373–374.
13 Silver HK. Medical students and medical school. JAMA 1982; 247: 309–310.
14 Simpson R, Albert W, Wilson DMC. Lifestyle assessment: part 4 the Halton Health Promotion Survey. Can Fam Phys 1984; 30: 2147–2155.
15 Fitzgerald D, Litt J, Ciliska D. Health consequences of selected lifestyle factors: a review of the evidence. Can Fam Phys 1984; 30: 2548–2554.
16 Sharratt JK, Sharratt MT, Smith DM. FANTASTIC lifestyle survey of University of Waterloo employees. Can Fam Phys 1984; 30: 1869–1872.
17 Wilson DMC, Nielson E, Ciliska D. Lifestyle assessment: testing the FANTASTIC instrument. Can Fam Phys 1984; 30: 1863–1866.
18 Kason Y, Ylanko VJ. FANTASTIC lifestyle assessment: part 5 measuring lifestyle in family practice. Can Fam Phys 1984; 30: 2379–2383.
19 Ciliska D, Wilson DMC. Lifestyle assessment: helping patients change health behaviors. Can Fam Phys 1984; 30: 1665–1670.
20 Cohen J. Statistical power analysis for the behavioral sciences. Revised ed. New York: Academic Press Inc. 1977: 384.

APPENDIX 1

## FANTASTIC LIFESTYLE ASSESSMENT

INSTRUCTIONS
For each item, place ✓ beside the box which best describes your behavior or condition in the past month

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **F**AMILY **F**RIENDS | My communication with others is open, honest and clear | almost always | | fairly often | | some of the time | | seldom | | almost never | |
| | I give and receive affection | almost always | | fairly often | | some of the time | | seldom | | almost never | |
| | I get the emotional support that I need | almost always | | fairly often | | some of the time | | seldom | | almost never | |
| **A**CTIVITY | Active exercise — 30 minutes eg. running, cycling, fast walk | more than 4 times/week | | 3 times/week | | 2 times/week | | seldom | | never | |
| | Relaxation and enjoyment of leisure time | almost daily | | 3 - 5 times per week | | 1 - 2 times per week | | less than once/week | | almost never | |
| **N**UTRITION | Balanced meals | almost always | | fairly often | | some of the time | | seldom | | almost never | |
| | Breakfast daily | almost always | | fairly often | | some of the time | | seldom | | almost never | |
| | Excess sugar, salt, animal fats, or junk foods | almost never | | seldom | | some of the time | | fairly often | | almost daily | |
| | Ideal weight | within 5 lbs (2 kg) | | within 10 lbs (4 kg) | | within 15 lbs (6 kg) | | within 20 lbs (8 kg) | | not within 20 lbs | |
| **T**OBACCO **T**OXINS | Tobacco use | none in the past 5 years | | none in the past year | | none in the past 6 months | | 1 - 10 times/week | | more than 10 times/week | |
| | Abuse of drugs: prescribed and unprescribed | almost never | | seldom | | some of the time | | fairly often | | almost daily | |
| | Coffee, tea, cola | never | | 1 - 2 daily | | 3 - 6 daily | | 7 - 10 daily | | more than 10 daily | |
| **A**LCOHOL | Average intake per week | 0 - 7 drinks | | 8 - 10 drinks | | 11 - 13 drinks | | 14 - 20 drinks | | more than 20 drinks | |
| | Alcohol and driving | never | | almost never | | only occasional | | once a month | | often | |
| **S**LEEP **S**EATBELTS **S**TRESS | 7 - 9 hours sleep per night | almost always | | fairly often | | some of the time | | seldom | | almost never | |
| | Frequency of seat belt use | always | | most of the time | | some of the time | | seldom | | never | |
| | Major stressful events in past year | none | | 1 | | 2 - 3 | | 4 - 5 | | more than 5 | |
| **T**YPE OF **P**ERSON **A**LITY | Sense of time urgency: impatience | almost never | | seldom | | some of the time | | fairly often | | almost always | |
| | Competitive and aggressive | almost never | | seldom | | some of the time | | fairly often | | almost always | |
| | Feelings of anger & hostility | almost never | | seldom | | some of the time | | fairly often | | almost always | |
| **I**NSIGHT | Positive thinker | almost always | | fairly often | | some of the time | | seldom | | never | |
| | Anxiety, worry | almost never | | seldom | | some of the time | | fairly often | | almost always | |
| | Depression | almost never | | seldom | | some of the time | | fairly often | | almost always | |
| **C**AREER (includes home-making, students, etc.) | Satisfied in job or role | almost always | | fairly often | | some of the time | | seldom | | almost never | |
| | Good relationships with those around | almost always | | fairly often | | some of the time | | seldom | | almost never | |

Thank you for completing the Fantastic Lifestyle Assessment

Please assist us by providing the following informations: Sex M ☐ F ☐ Age _____

Marital Status:
Single _____ Married _____ Separated _____ Divorced _____ Widowed _____

Student I.D. Number _____