

Student attitudes toward the International Clinical and Professional Chiropractic Education Position Statement and Evidence-based practice: a survey of UQTR chiropractic students

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Objective: The aim of this study is to describe the attitude of Université du Québec à Trois-Rivières (UQTR) chiropractic students toward the International Clinical and Professional Chiropractic Education Position Statement and evidence-based practice (EBP) beliefs.

Methods: A cross-sectional survey was administered to all the UQTR chiropractic students. Using a five-point Likert scale, students were asked to rate their level of

L'opinion des étudiants à l'égard de l'Énoncé de position international sur l'enseignement clinique et professionnel de la chiropratique et des pratiques fondées sur des données probantes : un sondage des étudiants en chiropratique de l'UQTR.

Objectif : L'objectif de cette étude est de décrire la position des étudiants en chiropratique de l'Université du Québec à Trois-Rivières (UQTR) à l'égard de l'Énoncé de position international sur l'enseignement clinique et professionnel de la chiropratique (ICEC) ainsi que les croyances associées aux pratiques fondées sur les données probantes (EBP).

Méthode : Une enquête transversale a été menée auprès de tous les étudiants en chiropratique de l'UQTR. À l'aide d'une échelle de Likert de cinq points,

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agreement with the position statement (10 items), EBP (2 items), interprofessional collaboration (2 items) and vitalistic philosophy (2 items).

Results: Survey response rate was 71%. Students most frequently reported strong agreement with the position statement, EBP and interprofessional collaboration. They also most frequently disagreed with vitalistic philosophy. The attitude toward the position statement was positively correlated with the year of study in the program ($r=0.10$, $p=0.019$), EBP ($r=0.56$, $p<0.001$) and interprofessional collaboration ($r=0.45$, $p<0.001$).

Conclusions: UQTR chiropractic students demonstrate high levels of agreement with EBP and the Education Position Statement.

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KEY WORDS: attitude; chiropractic; cross-sectional studies; students; surveys and questionnaires

Introduction

The chiropractic profession consists of heterogeneous clinicians with diverse attitudes toward healthcare identity, role, scope and application of evidence-based practice.¹⁻⁴ In Canada, approximately 19% of chiropractors report unorthodox clinical attitudes and behaviours toward X-ray use, drug and vaccine interventions, and conform to beliefs that vertebral subluxation is an obstruction to the expression of human health.⁵ Broad adoption of an evidence-based paradigm has been identified as an opportunity for the chiropractic profession to integrate into mainstream healthcare, including within the Canadian Forces Health Services.⁶ While non-evidence-based practises remain a professional barrier to healthcare integration, Puhl *et al.*⁷ found the strongest predictor of unorthodox professional practice characteristics for English-speaking Canadian chiropractors is the chiropractic program that they attended.

Students of chiropractic can also demonstrate both traditional and progressive attitudes toward chiropractic professional practice.⁸ Within geographical regions and countries chiropractic students can vary on a philosophic-

les étudiants devaient indiquer leur niveau d'accord avec l'ICEC (10 éléments), les EBP (2 éléments), la collaboration interprofessionnelle (2 éléments) et la philosophie vitaliste (2 éléments).

Résultats : Le taux de réponse était de 71 %. De façon générale, les étudiants étaient fortement en accord avec les énoncés de l'ICEC, l'EBP et la collaboration interprofessionnelle. Ils étaient également en désaccord avec la philosophie vitaliste. L'opinion des étudiants à l'égard de l'ICEC était positivement corrélée avec l'année d'études dans le programme ($r=0.10$, $p=0.019$), l'EBP ($r=0.56$, $p<0.001$) et la collaboration interprofessionnelle ($r=0.45$, $p<0.001$).

Conclusion : Les étudiants en chiropratique de l'UQTR démontrent des niveaux élevés d'accord avec l'EBP et l'ICEC.

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MOTS CLÉS : opinion; chiropratique; études transversales; étudiants; enquêtes et questionnaires

al spectrum of healthcare beliefs^{9,10}, which is predicted by the chiropractic educational institution¹⁰. As one example, Gleberzon *et al.*¹¹, compared two educational institutions in the United States and Canada and found differences in chiropractic students' attitudes on the expert role of chiropractors. Gleberzon *et al.*¹¹ assessed the likelihood that chiropractic students would use 'conservative' (vertebral subluxation, innate intelligence, disease, spinal misalignment and nerve flow interference) and 'liberal' (spinal lesion, impingement and joint dysfunction) terms. Through different lexicons, it was noted that the Canadian Memorial Chiropractic College (CMCC) teaches 'conservative' chiropractic concepts from a historical perspective whereas Parker University teaches both 'conservative' and 'liberal' concepts as part of their core curriculum.¹¹ While chiropractic student attitudes have been studied and characterized throughout English-speaking Canada and the United States^{9,12}, Australia and New Zealand¹⁰, England and Europe^{13,14}, there remains a paucity of research from Quebec's French speaking Canadians.

Inherently linked to professional attitudes and perhaps the most contentious concept in chiropractic and relat-

ed degree program curricula worldwide is the vertebral subluxation complex. The existence and definition of the vertebral subluxation complex have been the center of numerous debates within the chiropractic profession worldwide.¹⁵⁻¹⁷ Funk *et al.*¹⁸, analyzed 46 chiropractic programs and found the term subluxation eight times more frequent in US than non-US chiropractic course catalogues. In Canada, the term subluxation occurred in 2.7% of course descriptions at Université du Québec à Trois-Rivières (UQTR) versus 0% at CMCC.¹⁸ Similarly, the accrediting body's 2011 standards for both programs, the Canadian Federation of Chiropractic Regulatory and Educational Accrediting Boards (FCC) includes mention of subluxation in the context of joint dysfunction.¹⁸ Since 2014, sixteen chiropractic programs and one student union have formed The International Chiropractic Education Collaboration (ICEC) and have clearly delineated their Position Statement on Clinical and Professional Chiropractic Education standards.¹⁹ The ICEC ten position statements endeavor to deliver curricula that focus on patient-centered care, founded in evidence-based principles, and aligned with contemporary expectations of healthcare systems.

In Canada, the chiropractic profession maintains a French-language clinical training program within a public university setting at UQTR. It is currently unclear how frequently French-language chiropractic students identify toward orthodox and unorthodox professional tenets. Given this and the potential to influence future clinical practices, the aim of this study is to describe the attitudes of UQTR chiropractic students toward the International Clinical and Professional Chiropractic Education Position Statement and statements about evidence-based practice.

Methods

Ethical review for this study was approved by the Human Research Ethics Committee of Université du Québec à Trois-Rivières (CER-19-260-07.23).

Study design and setting

A Web-based cross-sectional survey of UQTR chiropractic students was conducted between January and March 2021. Participant recruitment involved the first author sending an initial e-mail invitation to all students enrolled into the chiropractic program, with two subsequent week-

ly e-mail reminders. In order to increase the response rate, the first author conducted a presentation of the project during virtual courses of every cohort of the program. Study data were collected using a web-based survey tool developed by UQTR (<https://confluence.uqtr.ca/display/AOPSP/BIQ>).

Survey instrument

The survey instrument included 19 items. Three were demographic questions, ten measured students' attitude toward the education position statement, two the evidence-based practice construct, two the interprofessional collaboration construct and two toward the vitalistic philosophy constructs.

Demographic profile

Information regarding gender, age and year of study in the program was collected at the beginning of the survey.

Attitude toward the education position statement

The International Clinical and Professional Chiropractic Education Position Statement¹⁹ was translated into Canadian-French and divided into ten statements. The Canadian-French translation was initially performed by a professional translator and then revised by a bilingual professor from the chiropractic department with experience in cross-cultural adaptation. The respondents were asked to rate their agreement with each statement on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). A summary score of attitude toward the education position statement, ranging from 5 to 50, was obtained by adding the level of agreement of each statement.

Evidence-based practice, interprofessional collaboration and vitalistic philosophy constructs

We selected five items from the questionnaire developed by Gliedt *et al.*⁹ and translated them into Canadian French. The following item was created specifically for this project: "All chiropractic programs should be associated with academic institutions that also include other health care programs". Participants rated their agreement with each item on a 5-point Likert scale. Evidence-based practice, interprofessional collaboration and vitalistic construct scores were created by adding the level of agreement of the two items related to each construct.

Test-retest reliability

To test whether student attitudes were stable over time, a sub-sample of students in the last year of the program were invited to complete our survey for a second time, two weeks after their initial completion. Finishing students were specifically selected to provide insight on the reliability of their attitudes at the end of the program before entering practice.

Statistical methods

The sample and responses to statements about the education position statement, evidence-based practice, inter-professional collaboration and vitalistic philosophy were analyzed using descriptive statistics (mean and standard deviation or frequencies and percentage). The internal consistency of students' summary scores were evaluated using Cronbach's alpha. Ceiling and floor effects (subject's scores at either extreme of the scale) were analyzed using descriptive statistics. A floor or ceiling effect was considered when more than 15% of respondents obtained the minimal or maximal score respectively.²⁰

Bivariate analyses were conducted between all variables. The Student t-test was used to describe associations by gender. Pearson's coefficient was used to describe correlations between continuous variables including the construct summary scores. The correlation coefficients were interpreted as follows: very high ≥ 0.90 , high 0.70-0.89, moderate 0.50-0.69, low 0.31-0.49, and little if any correlation ≤ 0.30 .²¹

Test-retest reliability of our survey instrument was assessed using Intraclass Correlation Coefficients (ICC) based on a single measurement, absolute-agreement, 2-way mixed-effects model. For ICC estimate, values less than 0.5, between 0.5 and 0.75, between 0.75 and 0.9, and greater than 0.90 were interpreted as poor, moderate, good, and excellent reliability, respectively.²²

Statistical significance was accepted at the 5% level. All analyses were conducted using SPSS Statistics for Mac version 27.0 (IBM Corp., Armonk, NY).

Results

A total of 165 students completed surveys, but eight were excluded because the respondents withdrew consent to share their responses for research purposes. One hundred and fifty-seven questionnaires were analyzed leading to a response rate of 70.7% (Figure 1). Respondent

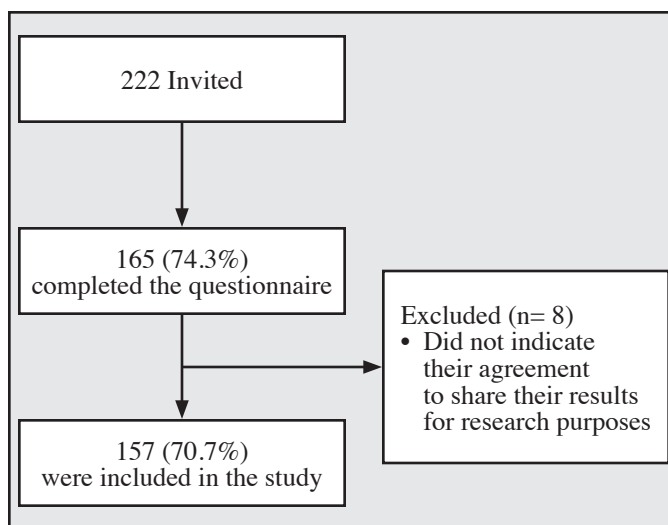


Figure 1.
Flowchart of the students' selection.

demographics are reported in Table 1. The majority of respondents were women (63%) and the average age was 22 years old. The participants were evenly distributed across the five cohorts of the program.

Table 2 shows the respondents' attitude toward the educational position statement. The majority of the respondents (60.5% to 84.7%) strongly agreed with all the items of the position statement with the exception of item #5 (related to the exclusive use of vertebral subluxation

Table 1.
Respondent demographics (n = 157).

		n (%)
Gender	Women	99 (63.1)
	Men	58 (36.9)
	Other	0
Year of study in the program	1	31 (19.7)
	2	31 (19.7)
	3	34 (21.7)
	4	28 (17.8)
	5	33 (21.0)
Mean (SD)		
Age [years]		22.4 (2.0)

SD = standard deviation

Table 2.
Respondent attitudes toward the Clinical and Professional Chiropractic Education Position Statement; n (%).

	Strongly Disagree [1]	Disagree [2]	Neutral [3]	Agree [4]	Strongly Agree [5]	Mean (SD)
1. Chiropractic education and training must acknowledge the biopsychosocial model of health care and be underpinned by biologically plausible theories and peer-reviewed research. It should embrace the value of clinical experience, shared decision-making and a patient centered approach to care.	—	1 (0.6)	11 (7.0)	58 (36.9)	87 (55.4)	4.5 (0.7)
2. Upon graduation, chiropractic students should be equipped to work effectively and collaboratively to deliver improved quality of life outcomes for patients with musculoskeletal disorders. This will, of necessity, incorporate:						
• An evidence-based approach to the case history, physical examination, diagnostic imaging, diagnosis, report of findings and management plan that may include a range of clinical interventions	—	—	2 (1.3)	18 (17.8)	127 (80.9)	4.8 (0.4)
• Effective communication in a language that is clearly understood by all stakeholders in healthcare, thereby facilitating interprofessional practice and promoting effective collaboration between health care teams	—	—	1 (0.6)	24 (15.3)	132 (84.1)	4.8 (0.4)
• Knowledge of preventative measures including but not limited to musculoskeletal care, encompassing wider public health and health promotion initiatives	—	1 (0.6)	2 (1.3)	25 (15.9)	129 (82.2)	4.8 (0.5)
3. Wherever possible, chiropractic educational programs should form or develop affiliations with established public and private universities preferably within a medical or health science faculty. Such links may develop opportunities for interprofessional education and collaborative practice.	—	—	4 (2.5)	45 (28.7)	108 (68.8)	4.7 (0.5)
4. Chiropractic educational institutions should support their faculties in the provision of innovative models for the development of knowledge, learning and skills. These should focus on facilitating scholarly activity including research, interprofessional education and teaching within the context of emerging health care models. [missing = 1 (0.6%)]	—	—	7 (4.5)	56 (35.9)	93 (59.6)	4.6 (0.6)
5. The teaching of vertebral subluxation complex as a vitalistic construct that claims or implies that it is the cause of or contributes to disease is unsupported by evidence. Its inclusion in a modern chiropractic curriculum in anything other than an historical context is therefore inappropriate and unnecessary.	11 (7.0)	35 (22.3)	35 (22.3)	31 (19.7)	45 (28.7)	3.4 (1.3)
6. Chiropractic education should reflect ethical practice and professional standards throughout the curriculum. Upon graduation, students must understand their responsibilities to their patients, their communities and to the profession	—	—	1 (0.6)	23 (14.6)	133 (84.7)	4.8 (0.4)
7. Practice styles ³ , which may contribute to inappropriate patient dependence, compromise patient confidentiality or require repeated exposure to ionizing radiation are not part of an undergraduate chiropractic curriculum. Students should be taught to recognize that such approaches are not acceptable in terms of the best interests of patients or the chiropractic profession.	2 (1.3)	8 (5.1)	18 (11.5)	48 (30.6)	81 (51.6)	4.3 (0.9)
8. The chiropractic programs should support the World Health Organization 'WHO's vision and mission in immunization and vaccines.	—	4 (2.5)	23 (14.6)	35 (22.3)	95 (60.5)	4.4 (0.8)
Summary score of agreement with the position statement (/50) [Cronbach α =0.78)						46.5 (3.4)

SD = standard deviation, **Bold** = mode

Table 3.

Participants responses to statements about evidence-based practice, scope of practice, identity and setting; n (%).

	Strongly Disagree [1]	Disagree [2]	Neutral [3]	Agree [4]	Strongly Agree [5]	Mean (SD)
Evidence-based practice						
It is important for chiropractors to be educated in evidence-based practice	—	2 (1.3)	11 (7.0)	46 (29.3)	98 (62.4)	4.5 (0.7)
Contemporary and evolving scientific evidence is more important than traditional chiropractic theory	—	6 (3.8)	18 (11.5)	52 (33.1)	81 (51.6)	4.3 (0.8)
Evidence-based practice construct score (/10) [Cronbach α =0.68]]						8.9 (1.3)
Interprofessional collaboration						
Inclusion of clinical chiropractic training internships in integrative medical settings is important to the progression of the chiropractic profession	2 (1.3)	4 (2.5)	13 (8.3)	43 (27.4)	95 (60.5)	4.4 (0.8)
All chiropractic programs should be associated with academic institutions that also include other health care programs	—	4 (2.5)	18 (11.5)	44 (28.0)	91 (58.0)	4.4 (0.8)
Interprofessional collaboration construct score (/10) [Cronbach α =0.34]]						8.8 (1.3)
Vitalistic philosophy						
The primary purpose of the chiropractic examination is to detect vertebral subluxations [missing = 1 (0.6%)]	35 (22.4)	76 (48.7)	31 (19.9)	12 (7.7)	2 (1.3)	2.2 (0.9)
It is appropriate for the chiropractic profession to distinguish and promote two separate subgroups of broad scope (providing manual and other non-drug procedures) and limited scope (providing subluxation correction only) [missing = 2 (1.3%)]	36 (23.2)	54 (34.4)	37 (23.9)	20 (12.9)	8 (5.2)	2.4 (1.1)
Vitalistic philosophy construct score (/10) [Cronbach α =0.004]]						4.6 (1.5)

SD = standard deviation, **Bold** = mode

complex in anything other than an historical context) for which 28.7% of the respondents strongly agreed. Responses to statements regarding evidence-based practice, interprofessional collaboration and vitalistic philosophy are outlined in Table 3. The majority of the respondents strongly agreed with all the evidence-based practice (51.6% to 62.4%) and interprofessional collaboration (58.0% to 60.5%) items. Most of the respondents disagreed (34.4% to 48.7%) or strongly disagreed with the vitalistic philosophy (22.4% to 23.2%) items. The internal consistency of the attitude toward the education position statement was good (Cronbach α =0.78), moderate for the evidence-based practice construct (Cronbach α =0.68), and low for the interprofessional collaboration construct

(Cronbach α =0.34). The vitalistic philosophy construct did not seem to demonstrate internal consistency (Cronbach α =0.004). Ceiling effects, when >15% of respondents report the maximum scores across items, were present for the attitudes toward the education position statement (n = 35, 22%), the evidence-based practice construct (n = 69, 44%), and the interprofessional collaboration construct (n = 64, 41%). The vitalistic philosophy construct did not demonstrate either a ceiling or floor effect.

Results of the bivariate analyses are presented in Table 4 for gender and Table 5 for continuous variables (age, year of study in the program, evidence-based practice, interprofessional collaboration, vitalistic philosophy, attitude toward the position statement). The students' year

in program was positively correlated with their attitudes toward the education position statement and negatively correlated with the vitalistic philosophy construct. The attitude toward the education position statement, the evidence-based practice construct and the interprofessional collaboration construct were all positively and statistically significantly correlated with each other. None of the measured variables significantly differed between men and women.

During the test-retest assessment, the constructed score for the attitude toward the education position statement

(ICC = 0.70; $p < 0.001$), the evidence-based practice construct (ICC = 0.78; $p < 0.001$), the interprofessional collaboration construct (ICC = 0.67; $p = < 0.001$), and the vitalistic philosophy construct (ICC = 0.55; $p = 0.001$) demonstrated moderate to good test-retest reliability. The detailed test-retest assessment of each item of our survey instrument is presented in Appendix 1.

Discussion

In this study, French-Canadian speaking chiropractic students most frequently reported very strong attitudes that agreed with the ICEC education position statements, evidence-based practice and interprofessional collaboration. The same students most frequently disagreed with statements on vitalistic philosophy. We found the internal consistency of construct domains were good for the ICEC education position statements, moderate for evidence-based practice and low for interprofessional collaboration statement scores. The vitalistic philosophy statements score was not internally consistent in our analysis. Current UQTR students report moderate and low correlation between attitude summary scores for the ICEC education position statements, statements about evidence-based practice and interprofessional collaboration, respectively. We found moderate stability of final

Table 4.
Gender analysis

	Women		Men		p-value
	Mean	SD	Mean	SD	
Age [years]	22.4	2.0	22.5	2.2	0.796
Year of study in the program	3.1	1.4	2.9	1.5	0.613
Evidence-based practice	8.8	1.4	9.0	1.1	0.211
Interprofessional collaboration	8.8	1.4	8.9	1.1	0.810
Vitalistic philosophy	4.5	1.3	4.7	1.6	0.334
Agreement with the position statement	46.1	3.5	47.0	3.2	0.113

SD = standard deviation

Table 5.
Bivariate analysis of continuous variables

		Age [years]	Year of study in the program	Evidence- based practice	Inter- professional collaboration	Vitalistic philosophy	Attitude toward the position statement
Age [years]	r p-value	1					
Year of study in the program	r p-value	0.73 <0.001	1				
Evidence-based practice	r p-value	0.10 0.206	0.18 0.029	1			
Interprofessional collaboration	r p-value	-0.02 0.804	-0.01 0.935	0.42 <0.001	1		
Vitalistic philosophy	r p-value	-0.15 0.071	-0.39 <0.001	-0.09 0.254	0.01 0.936	1	
Attitude toward the position statement	r p-value	0.07 0.429	0.10 0.019	0.56 <0.001	0.45 <0.001	-0.04 0.591	1

r = Pearson correlation coefficient; **Bold** = Statistically significant correlation

year student construct scores of attitudes toward the ICEC education position statement, interprofessional collaboration and vitalistic philosophy and good stability for the evidence-based practice score.

Our findings show French-Canadian speaking chiropractic students can most commonly be characterized as orthodox/liberal according to continuums of chiropractic professional attitude.^{7,8,23} This finding differs from recent studies of English-speaking chiropractic students in North America, Europe and Australia/New Zealand who most commonly report attitudes somewhere between the two ends of the spectrum.^{8,11,24} Not only did UQTR students demonstrate orthodox attitudes, but there also was a consistent pattern of attitudes across construct domains for ICEC agreement, evidence-based practice, interprofessional collaboration and vitalistic philosophy. This differs from some Australian and New Zealand institutions studied by de Luca *et al.*¹⁰, where student attitudes varied across domains of identity, role/scope, setting and future. Moreover, a recent study by Swain *et al.*⁸, showed a relatively large proportion of chiropractic students internationally report contradictory ideological attitudes, which does not seem to be the case at UQTR. We speculate that differences found in our sample could be potentially explained by the UQTR program being based in a public university. Integrated chiropractic students have basic sciences and interprofessional courses with students of other healthcare programs (biomedical sciences, kinesiology, medicine, midwifery, nursing, occupational therapy, podiatry, speech language therapy). The research obligations of professors are also the same within all the departments of the university. These factors might lead to an orthodox institutional lexicon and curriculum. In addition, because the number of chiropractic student places are limited to 47 per year, students are selected based on academic results and individual interviews. Approximately 20 to 25% of the applications for the program will receive an admission offer leading to the selection of academically performant students. In Quebec, students can directly access the chiropractic program and most of the university-based healthcare programs after completing their college (CEGEP) degree.

The distribution of UQTR student attitudes reported in the vitalistic philosophy domain of this study most notably contrasts against previous research conducted in North America⁹. Gliedt *et al.*⁹ surveyed students enrolled

at 12 Doctor of Chiropractic degree programs in 2013-14 and found 44.6% of respondents agreed with the statement “The primary purpose of the chiropractic examination is to detect vertebral subluxations” compared to 9% in the current study. For the statement “It is appropriate for the chiropractic profession to distinguish and promote two separate subgroups of broad scope (providing manual and other non-drug procedures) and limited scope (providing subluxation correction only)” Gliedt *et al.*⁹ reported 37.2% of respondents disagreed versus 57.6% of respondents in the current study. For both studies the latter statement had the highest proportion of respondents (approximately one-quarter) reporting a neutral response. While the implications of the different rates to the first statement are clear, the frequency of responses to the latter statement suggest French-Canadian speaking students might not have a clear position on whether or not the chiropractic profession should divorce²⁵ despite much uncertainty in the group.

Our operationalization of the ICEC education position statement into a questionnaire leading to a summary score has produced an internally consistent and moderately reliable tool that was significantly correlated with interprofessional collaboration and evidence-based constructs suggesting a promising concurrent validity. This tool might be informative for future research. Nearly two decades ago, it was suggested that measuring chiropractic philosophy is complex and that further methodological developments would be required to adequately achieve this goal.²⁶ Since then, many researchers have attempted to measure components of chiropractic or vitalist philosophy with tools of suboptimal or unknown psychometric properties.^{5,9,11,26} Our results make no exception, although the vitalistic philosophy construct demonstrated moderate reliability, the two items composing it were not internally consistent. This suggests that attitudes toward vitalistic philosophy is a complex construct that requires more sophisticated evaluation. Future research should develop a valid and reliable tool to adequately assess the vitalistic philosophy within the chiropractic profession.

Strengths and limitations

The recruitment strategy has produced a response rate three-fold higher than previous studies in North America⁹, and Australia and New Zealand¹⁰. We cannot completely rule out the possibility that the non-responders might have

different attitudes than responders to our survey. Due to the anonymous nature of the survey, we cannot conduct a responder/non-responder analysis. Our response rate is sufficient to generalize our findings to seven out of 10 UQTR chiropractic students. However, it might not be generalizable to all French speaking chiropractors in Quebec since they might have graduated from different institutions or during a different time period at UQTR. Our data were collected during the COVID-19 pandemic, and it is not clear how this might have influenced student's attitudes. The internal consistency and reliability of the survey instrument used were all found to be satisfactory, with the exception of the internal consistency of the vitalistic philosophy construct; thus, limiting the possibility of information bias. Since previous studies using the many identical questions in English did not report frequent use of the end of the scale^{9,10}, we suggest that the ceiling effects observed are inherent to the particular characteristics of our population. The adaption of the ICEC education position statement items proved to be a novel and internally consistent measure of student attitudes. However, the transformation of the ICEC education position statement into questions has produced a few items with complex statements. The psychometric properties of our tool might potentially be improved by dividing the complex items into multiple items.

Conclusion

UQTR chiropractic students demonstrate high levels of agreement with evidence-based practice, interprofessional collaboration and the ICEC education position statement. These attitudes seem to be stable at the end of the program. Further research is required to adequately quantify the attitude of chiropractic students toward vitalistic philosophy.

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Appendix 1.
Test-retest reliability

	Intraclass Correlation Coefficients	95% Confidence Interval	P-value
Demographics			
Age	0.99	[0.98 - 0.99]	<0.001
Attitude toward the Clinical and Professional Chiropractic Education Position Statement			
1. Chiropractic education and training must acknowledge the biopsychosocial model of health care and be underpinned by biologically plausible theories and peer-reviewed research. It should embrace the value of clinical experience, shared decision-making and a patient centered approach to care.	0.40	[0.06 - 0.66]	0.008
2. Upon graduation, chiropractic students should be equipped to work effectively and collaboratively to deliver improved quality of life outcomes for patients with musculoskeletal disorders. This will, of necessity, incorporate:			
a) An evidence-based approach to the case history, physical examination, diagnostic imaging, diagnosis, report of findings and management plan that may include a range of clinical interventions	0.36	[0.02 - 0.64]	0.022
b) Effective communication in a language that is clearly understood by all stakeholders in healthcare, thereby facilitating interprofessional practice and promoting effective collaboration between health care teams	0.46	[0.13 - 0.70]	0.005
c) Knowledge of preventative measures including but not limited to musculoskeletal care, encompassing wider public health and health promotion initiatives	0.14	[-0.24 - 0.48]	0.233
3. Wherever possible, chiropractic educational programs should form or develop affiliations with established public and private universities preferably within a medical or health science faculty. Such links may develop opportunities for interprofessional education and collaborative practice.	0.39	[0.05 - 0.65]	0.015
4. Chiropractic educational institutions should support their faculties in the provision of innovative models for the development of knowledge, learning and skills. These should focus on facilitating scholarly activity including research, interprofessional education and teaching within the context of emerging health care models.	0.36	[-0.00 - 0.64]	0.027
5. The teaching of vertebral subluxation complex as a vitalistic construct that claims or implies that it is the cause of or contributes to disease is unsupported by evidence. Its inclusion in a modern chiropractic curriculum in anything other than an historical context is therefore inappropriate and unnecessary.	0.39	[0.27 - 0.66]	0.018
6. Chiropractic education should reflect ethical practice and professional standards throughout the curriculum. Upon graduation, students must understand their responsibilities to their patients, their communities and to the profession	0.28	[-0.10 - 0.59]	0.071
7. Practice styles, which may contribute to inappropriate patient dependence, compromise patient confidentiality or require repeated exposure to ionizing radiation are not part of an undergraduate chiropractic curriculum. Students should be taught to recognize that such approaches are not acceptable in terms of the best interests of patients or the chiropractic profession.	-0.01	[-0.37 - 0.36]	0.510

	Intraclass Correlation Coefficients	95% Confidence Interval	P-value
8. The chiropractic programs should support the World Health Organization 'WHO's vision and mission in immunization and vaccines.	0.45	[0.11 - 0.69]	0.003
<u>Summary score of attitude toward the position statement</u>	0.70	[0.46 - 0.85]	<0.001
Evidence-based practice			
It is important for chiropractors to be educated in evidence-based practice	0.66	[0.40 - 0.83]	<0.001
Contemporary and evolving scientific evidence is more important than traditional chiropractic theory	0.56	[0.24 - 0.77]	<0.001
<u>Evidence-based practice construct score</u>	0.78	[0.59 - 0.89]	<0.001
Interprofessional collaboration			
Inclusion of clinical chiropractic training internships in integrative medical settings is important to the progression of the chiropractic profession	0.62	[0.33 - 0.80]	<0.001
All chiropractic programs should be associated with academic institutions that also include other health care programs	0.66	[0.36 - 0.83]	<0.001
<u>Interprofessional collaboration construct score</u>	0.67	[0.41 - 0.83]	<0.001
Vitalistic philosophy			
The primary purpose of the chiropractic examination is to detect vertebral subluxations	0.56	[0.24 - 0.76]	<0.001
It is appropriate for the chiropractic profession to distinguish and promote two separate subgroups of broad scope (providing manual and other non-drug procedures) and limited scope (providing subluxation correction only)	0.52	[0.19 - 0.75]	0.002
<u>Vitalistic philosophy construct score</u>	0.55	[0.23 - 0.76]	0.001