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ORIGINAL ARTICLE

Suggestions for improving patient safety culture within international chiropractic teaching settings: A qualitative analysis of clinic partner feedback from a mixed method survey

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ABSTRACT

Objective: To describe clinic stakeholder suggestions for improvements in patient safety in chiropractic teaching clinical settings.

Methods: We conducted a mixed-methods, cross-sectional survey to extend SafetyNET, a research project into patient safety culture in chiropractic. Our sample ($n = 864$) included clinic students, faculty, and staff from chiropractic programs from 4 different countries. We launched the Survey to Support Quality Improvement via REDCap, with respondents completing site-specific surveys in 6-week increments between May 2019 and November 2021. Open-ended questions elicited written suggestions to improve patient safety in 4 domains: education, clinical setting, communication, and leadership. Cross-institutional research teams conducted qualitative content analysis to identify relevant themes.

Results: Respondents ($n = 460$; 53.2%, of which 47.2% were female) included 386 students, 45 faculty, and 29 staff. We analyzed 166 to 225 unique responses consisting of short phrases to full paragraphs per question. Our analysis inspired an interactive Safety Compass Model of Patient Safety Culture in Chiropractic Teaching Clinics, which includes 8 themes. Accountability and Transparency were essential values for individuals and organizations. Safety Education on safety-related topics was counterbalanced by Safety Reporting structures and procedures. Educators teach Clinical Standards of patient safety, while communication patterns circulate Risk Mitigation processes. Clinic settings establish Patient-Centered environments, while leadership sustains the overall framework through Administrative Oversight.

Conclusion: Students, faculty, and staff stakeholders identified myriad opportunities to improve patient safety culture in chiropractic teaching clinics. Chiropractic teaching programs are encouraged to use the Safety Compass Model to identify and address areas for improvement in their own institutions.

Key Indexing Terms: Patient Safety; Chiropractic; Education; Organizational Culture; Ambulatory Care Facilities; Risk Management

J Chiropr Educ 2025;39:eJCE-24-15 DOI 10.7899/JCE-24-15

INTRODUCTION

Patient safety is fundamental to health care excellence and quality patient care.[1] Patient safety cultures that are open, constructive, trustworthy, and accountable are recognized priorities across health care settings and professions.[1,2] Health care organizations establish and sustain patient safety cultures through shared values, beliefs, policies, and practices that prevent and reduce the risk, occurrence, frequency, and impact of avoidable harms, medical errors, adverse events, and other safety incidents.[1,3] The World Health Organization *Global Patient Safety Action Plan* notes that health care environments with strong safety cultures encourage, expect, and empower all patients and partners to share their safety concerns by engaging in transparent communication without fearing negative consequences.[3]

Teaching clinics are unique health care environments that combine the inherent challenges of delivering safe health services within an ambulatory care setting while training novice professionals to deliver such care in an academic institution.[4] Teaching clinics are characterized by high volumes of rotating personnel, including clinical students or student interns who train temporarily within the setting, and clinical faculty who may practice on nonstandard work schedules and oversee care delivered by groups of unlicensed trainees. Common issues in teaching clinics, such as discontinuity of providers or treatments, miscommunication, and

Table 1 - Short Answer Survey Questions

Communication	How can communication about patient safety be improved at your institution?
Clinical setting	Thinking about the clinic setting, what suggestions do you have related to improving patient safety for office procedures, documentation, equipment, patient follow-ups, information exchange, or other related items?
Education	How can the education about patient safety be improved within your clinic setting? (include in the curriculum, specific focused workshops, training opportunities, etc)
Leadership	How can leaders improve patient safety in their teaching clinics? (ie, improve communication, implement policies and procedures, regular reporting, etc)

gaps in care coordination, may lead to safety incidents.[5,6] Teaching clinics are rife for innovation in patient safety as the clinical students, who are delivering patient care in real world settings for the first time, can generate new ideas and clinical insights regarding patient safety.

Patient safety research within chiropractic training programs has evolved since the early 2000s.[7,8] Our team pioneered the evaluation of patient safety culture within 5 international (North America and Europe) chiropractic teaching clinics in a mixed-methods survey of patient safety attitudes and perceptions among faculty clinicians, student interns, and staff.[9] We conducted this survey based on the Agency for Healthcare Research and Quality Medical Offices Survey for Patient Safety Culture[10] modified by the SafetyNET team (an international, multidisciplinary research team focused on promoting and supporting patient safety culture among providers delivering spinal manipulation therapy).[11,12] Our team observed that faculty clinicians, student interns, and staff positively perceived teamwork and organizational learning within chiropractic teaching clinics while identifying communication, staff training, clinic standardization, and leadership support as domains for improvement.[9] Such partner engagement is critical to developing and disseminating sustainable strategies to enhance patient safety.[3,13] Our purpose in this study was to explore suggestions from clinic partners in chiropractic teaching programs on the ways their institutions might improve teaching clinics' patient safety culture in 4 distinct domains: education, clinical setting, communication, and leadership.

METHODS

Study Design

This study replicates and extends the inaugural SafetyNET Survey to Support Quality Improvement, which has been used to assess the patient safety culture of chiropractic teachings clinics.[9,14,15] The study design was a concurrent, embedded, mixed-method cross-sectional survey conducted online via REDCap (Research Electronic Data Capture, Vanderbilt University) hosted at Parker University.[15,16] Our study population was clinic students, faculty, and staff from chiropractic programs from 4 different countries. This paper reports our primary qualitative findings which consisted of a conventional content analysis using an interpretative approach. Quantitative results and separate qualitative analyses are forthcoming. Supplementary File 1 provides the Standards for Reporting Qualitative Research (SRQR) checklist.[17] Parker University institutional review board (A-00139) approved the study protocol. Site investigators and research team members completed human subjects training and signed data sharing agreements with SafetyNET lead investigators (MF, KAP). Submitted surveys constituted respondent consent.

Researcher Characteristics

This study was led by 3 established, multidisciplinary researchers (KAP, MF, SAS) who have worked together for many years on SafetyNET and chiropractic safety culture projects. Our team included 4 students completing Doctor of Chiropractic programs in the United States [2 from Parker University (KAK, ANC) and 2 from Palmer College of Chiropractic (AB, VW)] and 5 chiropractic faculty clinicians, 1 from Parker University (MM) and 4 from Canadian Memorial Chiropractic College (AL, BJP, CB, ES). The established researchers provided training sessions on qualitative methods, oversaw data analyses at their respective institutions, and provided cultural and programmatic context on the overall projects within their expertise areas. Students and faculty clinician team members conducted data analysis and contributed to manuscript preparation.

Study Settings and Participants

Study settings included 4 chiropractic teaching programs, with 2 located in North America, 1 in Australia, and 1 in Europe. Site investigators oversaw survey implementation and a program administrator provided written support to conduct the study at each institution. We invited faculty clinicians ($n = 58$) and all students cleared to provide patient care in the 4 clinics ($n = 708$), as well as clinic staff ($n = 32$) from 3 institutions to participate (total $n = 864$). The teaching programs and individual participants were offered anonymity regarding their study involvement as part of the administrative approval and informed consent processes. No incentives were provided.

Survey Instrument

Our instrument was the Survey to Support Quality Improvement (SafetyNET).[9,11] The previously validated survey included 5 new qualitative items: one open-ended question to gain insight into definitions of patient safety among teaching clinic stakeholders (which will be reported on in a separate manuscript) and 4 open-ended questions to explore patient safety themes (Table 1) that emerged during our inaugural evaluation.[9] Each qualitative question was "required" by survey programming to allow identification of intentionally skipped items.

Data Collection and Management

Study personnel programmed and implemented the SafetyNET Survey on REDCap hosted at Parker University.[15,16] As

Table 2 - Number and Type of Responses by Question (N = 460 Respondents)

	Communication	Clinical Setting	Education	Leadership	Response Type Totals
Relevant response	225	184	194	166	769
Blank/punctuation (")	164	172	177	197	710
Nonsensical (A;SDKLFJ)	3	3	4	4	14
Noninformative: None	20	54	36	38	148
Noninformative: Not applicable	23	27	27	32	109
Noninformative: Don't know	25	20	22	23	90

per the concurrent embedded mixed methods design, qualitative and quantitative data were collected electronically at the same time in 1 survey, with each site completing the survey within a 6-week timeframe, staggered by site, between May 2019 and November 2021. The senior investigator (KAP) exported data sets in Microsoft Excel, Corp format, stored them on a secure cloud server, cleaned the data (ie, removed identifiers including those for teaching program name or country, double-checked nonsensical entries), and created data sets for qualitative analysis. All surveys were distributed in English and responses were mainly written in English; responses written in another language were translated by the respective site lead and a graduate student proficient in English.

All responses were included in prepared data sets, with nonrelevant responses that did not allow for content analysis separated from the analytic data and counted (Table 2). The analytic data set included 769 relevant responses consisting of a range of 1–191 word counts and an average of 13.4 words for the 166–225 unique responses per question.

Data Analysis

Our cross-institutional research team foregrounded its qualitative analysis in this concurrent embedded mixed methods study. To accomplish this, we conducted a multi-phased conventional content analysis as outlined in Figure 1.[18] Per our data sharing agreements, our focus in this analysis was to identify aggregate suggestions for improvement in patient safety across all chiropractic teaching clinics participating in this study. In Round 1, 3 teams, each led by an experienced SafetyNET researcher, completed independent coding and team-level consensus on 1 question (Team 1 Education, Team 2 Clinical Setting, Team 3 Leadership). Each member individually coded responses to the assigned question, working in batches of 10–20 entries, to create codes from the text.[18] Each team met via conference call to develop its codebook by sharing codes for each entry, reaching consensus on code names and definitions, updating previously coded passages, and resolving disagreements.

Round 2 was conducted similarly to Round 1, with Team 1 and Team 3 jointly analyzing the communication question using shared codebooks from the first 3 questions. In Round 3, Team 1 and Team 3 met to crosswalk codes across all 4 questions to create a master codebook. Cross-walking was achieved by comparing code definitions and coded entries across each question and team to identify common themes, with theme names modified as indicated and definitions refined through consensus building. Team 2 peer reviewed the coding crosswalk results and clarified discrepancies. Coding decisions

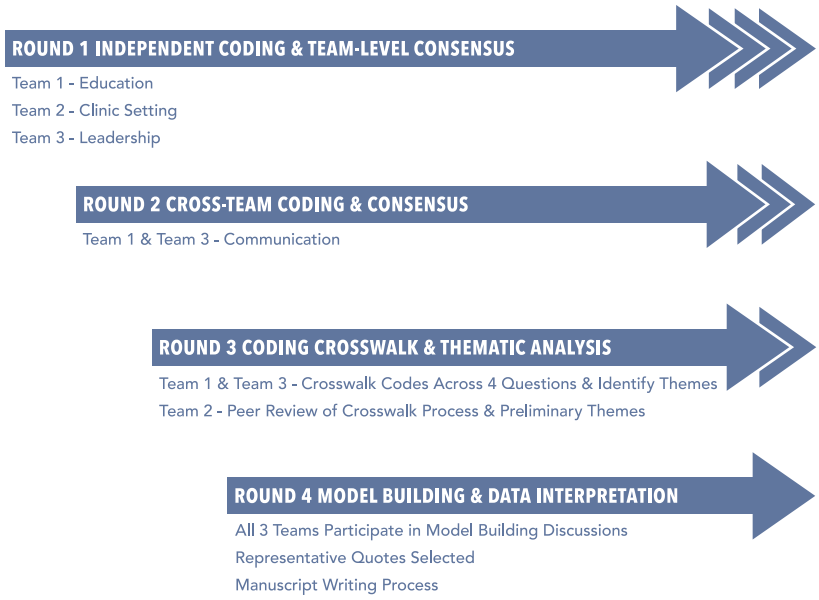

Figure 1 - Outline of the multiphased conventional content analysis.

Table 3 - Respondent Characteristics (N = 460)

Characteristics	*n* (%)
Gender, female	217 (47.2%)
Role	
Student	386 (83.9%)
Clinician faculty	45 (9.8%)
Staff	29 (6.3%)
Chiropractic programs	
Program A	128 (27.8%)
Program B	121 (26.3%)
Program C	25 (5.4%)
Program D	186 (40.4%)

in each round were documented on spreadsheets, with all members sharing responsibility for inputting data during team meetings. In Round 4, all teams participated in data interpretation, model building, and manuscript writing. Throughout the iterative coding process, teams returned to the previous coding rounds to refine codes and definitions as indicated by subsequent analysis. Representative quotes include respondent role, program code, identity number, and question area from which the quote was derived: *(Student, Program A-241, Leadership)*.

RESULTS

Respondents

Our 460 respondents (53.2% response rate) included 386 students (83.9%), 45 faculty (9.8%), and 29 staff (6.3%). Table 3 reports respondent characteristics.

Model Overview

Figure 2 displays an overview of our qualitative findings. The model, *Safety Compass Model of Patient Safety Culture in Chiropractic Teaching Clinics,* expands our previous depiction of stakeholder perceptions of patient safety to include the domains of education, clinical setting (formerly processes/procedures), communication, and leadership as its foundation (4 corners of model).[9] The original rectangular shape of our model, with its boxy, static, and disconnected themes morphs into a compass-like figure with cross-cutting themes that both influence and are impacted by the themes adjacent to and directly across in the model. Like a compass needle, the whole model spins dynamically, so that any theme (such as risk mitigation) may point to any foundational component (like communication) that requires attention within the broader patient safety culture of the chiropractic teaching clinic.

Thematic Overview

Table 4 outlines the 8 major themes derived from this analysis. On the north-south compass axes are the themes of *Accountability* and *Transparency*, which acknowledge the utmost importance of professionalism within a health care field and the mandate for health care organizations to be open, trusting, proactive, and credible in their approach to patient safety. On the east-west compass axes are and *Safety Reporting* and *Safety Education,* which encompass the data collection processes through which patient safety incidents are documented,

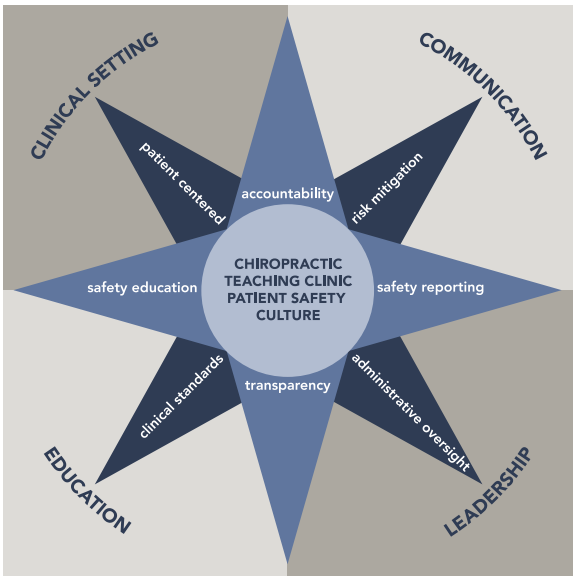

Figure 2 - Safety compass model of patient safety culture in chiropractic teaching clinics.

monitored, and acted upon, and the need for didactic understandings of patient safety issues in chiropractic, respectively. The north-east and south-west axes represent *Risk Mitigation*, or actions to reduce adverse events, and *Clinical Standards,* which describes adherence to evidence-based standards of care. Finally, the south-east and north-west contra-axes encompass *Administrative Oversight*, which represents the business of patient care within a health care setting, and *Patient-Centered,* or a clinical focus on patient care concerns.

Qualitative Results

Accountability, the "true north" theme of the Patient Safety Compass, is an ethical approach to patient safety, demonstrated by the professional value of accepting personal responsibility for mistakes made by oneself or one's delegates, during clinical encounters or in student training. Crosswalked codes comprising the theme included *accountability behaviors*, *safety culture: accountability*, and *professionalism*. Unique themes highlighted *clinician willingness* to engage in patient safety activities and *clinical supervisor oversight* of students within the clinic setting.

Students appreciated "professionalism" (*Student, Program B-043*) and noted faculty clinicians demonstrate accountability when they "do things with integrity" (*Student, Program D-456*). Another student recommended:

> "Leaders can improve it [patient safety] by admitting mistakes and giving examples of their own mistakes to learn from." (*Student, Program A-245*)

A suggested method for passing on the value of accountability during clinical teaching was:

> "Round table discussions. More presence of clinicians in treatment rooms, educating students that adverse reactions is *(sic)* OK to report without penalty." (*Faculty, Program D-111*)

Table 4 - Patient Safety Culture Themes, Definitions, and Selected Quotes

Theme	Definition	Selected Quotes
Accountability	Professional value of accepting personal responsibility for mistakes made by oneself or delegates; ethical approach to assure patient safety during clinical encounters and oversight of student training	"Leaders can improve it [patient safety] by admitting mistakes and giving examples of their own mistakes to learn from." - *Student, Program A-245*
Transparency	Transparent open communication among administrators, clinic personnel, students, and patients about safety-related topics	"Not always replying with punishment to an error but open the dialogue and exchange instead to make students more free to talk about their difficulties." - *Student, Program B-782*
Safety education	Structured safety training (adverse events, documentation, clinical risk assessment); curricular training gaps/inconsistencies; delivery format (workshops, hands-on training); expectations for student role (dispel cognitive dissonance, encourage positive behavior)	"Create a best-practices approach to teaching patient safety." - *Faculty, Program A-329* "More education on what is expected on Day 1, clear policies put in place." - *Student, Program A-242*
Safety reporting	Safety event documentation in clinical records; standardized policies/procedures for safety reporting/follow-up; data collection tool/processes so patients can report safety concerns/other experiences	"Report. Every. Single. Issue. ..." - *Student, Program A-317* "Make documentation easier and more accessible to patients." - *Student, Program B-023*
Risk mitigation	Actions taken to reduce frequency and/or impact of adverse events	"Monthly rounds on incidents that happened and how to prevent it from happening again." - *Student, Program A-200*
Clinical standards	Adherence to professional, evidence-based standards of care	"Have all staff knowledgeable about policy and procedures so they may respond appropriately." - *Staff, Program C-278*
Administrative oversight	Organizational level regulation, policies, procedures, or evaluation of patient safety; implementation of safety programs or initiatives	"Implement what is planned in the curriculum." - *Faculty, Program C-804*
Patient-centered	Health care delivered with respect for the needs, preferences, goals, and desired outcomes of the patient	"Model safe behaviors with patients and have open lines of communication" - *Faculty, Program A-319*

Transparency grounds the model and encompasses the ideal of open communication and trusting interactions among clinic stakeholders to create a shared understanding of patient safety. Crosswalked codes included both *internal communication* among clinic personnel and *interprofessional communication* with providers outside the clinic. A transparent organization creates psychological safety to allow students, patients, and staff to talk about safety concerns:

> "I'm a new intern, so I don't know yet, but I think all clinic workers should feel free to communicate any instances of violations or harassment or suggestions to improve the workplace without fear of repercussions." (*Student, Program D-553*)

Another student from a different program expanded:

> "Not always replying with punishment to an error but open the dialogue and exchange instead, to make students more free to talk about their difficulties." (*Student, Program C-782*)

Clinic staff agreed transparent communication was needed to teach students about patient safety*:*

> "Improve communication. A doctor should never tell an intern, 'This is just how it's done' without an explanation." (*Staff, Program D-108*)

Safety Education was defined as structured, evidence-based training on patient safety, including topics such as adverse events, clinical risk assessment, and documentation. One student said, "They [faculty] do a great job of equipping the students." (*Student, Program D-574*) However, crosswalked codes concentrated on *curricular inconsistencies or gaps* in current safety training or a need for *curricular reform.* One faculty clinician challenged leaders to "create a best-practices approach to teaching patient safety." (*Faculty, Program A-329*)

Empirical training, hands-on skills, or workshops on adverse events fell into this domain:

> "Talks about common and serious adverse effects and how to minimize risk and how to deal with aftermath." (*Faculty, Program D-110*)
> "Standardized responses to adverse events could be included in the curriculum to give interns confidence in how to respond to adverse events." (*Student, Program B-251*)

Pragmatic *learning scenarios* were also highlighted:

> "Actually review patient safety with interns. How to properly educate patients on rolling out of bed, how to properly guard patients." (*Student, Program D-454*)

Students desired *encouragement* from faculty for their positive behaviors that could reinforce safety for all patients. Students also wanted clear *expectations* for their role in patient safety to dispel cognitive dissonance between the ideal approach taught in the classroom and the real world of patient care. Clinic staff concurred.

> "More education on what is expected on Day 1, clear policies put in place." (*Student, Program A-242*)
> "Intern training at [program] does not cover many of the manual therapy procedures we are asked to perform in clinic." (*Staff, Program D-457*)

Safety Reporting centered around the need for documentation of safety events in clinical records, procedures related to event reporting and follow-up, and data collection tools or processes to allow patients to report safety events or other concerns. One participant recommended the use of email questionnaires to improve communication between patients and clinicians.

"Communication between patient/clinicians improvement—perhaps the option to respond to a questionnaire via email post visit." (*Student, Program C-023*).

Another participant noted that patient feedback was best achieved by ensuring patients' understanding of procedures.

"Make sure patients understand what was done and if they understood when they checked out." (*Staff, Program D-279*).

Risk Mitigation, or actions taken to reduce the frequency or impact of adverse events, closely aligned with suggestions for ***Safety Reporting*** and ***Safety Education***. Crosswalked codes included *risk management, adverse events/clinical errors, prevention,* and *safety procedures: quality control.* Students suggested regularly scheduled discussions of safety events to enhance institutional learning:

> "Monthly rounds on incidents that happened and how to prevent it from happening again." (*Student, Program A-200*)
> "Regular reporting, rounds on communication and adverse events, and going over the risk section of the ROFs [report of findings] so we're all on the same page." (*Student, Program B-218*)

Unique codes generated under Clinical Setting included *equipment* and *physical facilities:*

> "Get equipment that works where the risk of error or malfunction is low." (*Student, Program A-201*)
> "Make sure clinic supplies are ordered in a timely fashion. Keep clinic cleaner, make sure interns/janitors clean clinic better." (*Student*, *Program A-222*)

Students across programs also identified *timeliness* and *follow-up* as vital components of risk mitigation: "Taking the time to focus on the patient in front of you" (*Student, Program D-587)* and "Improve communication, timely check-ins." (*Student, Program C-015*)

Clinical Standards referred to adherence to professional, evidence-based standards of care for chiropractors. This was the only major theme that did not have codes cross-walked across all 4 questions. Unique codes described procedures, standards of care, and clinical procedures, with some responses direct: "Policies and procedures." (*Student, Program D-482*) Others expanded:

> "Be clear and communicate effectively with office personnel on what procedures and practices should be adhered to in order to foster greater patient safety." (*Student, Program D-516*)

Clinic hygiene and privacy also were mentioned: "More emphasis on clinic hygiene" (*Student, Program B-222*), "Increase the amount of rooms available for privacy" (*Student, Program D-497*), and "Remind interns and staff about privacy and safety" (*Staff, Program D-122*).

Administrative Oversight was defined as organizational-level regulations, institutional policies and procedures, and evaluation efforts related to addressing patient safety programs or initiatives. Crosswalked codes expressed the idea of management, policy and procedure, quality control, and implementation. Unique codes identified clinical workloads, staffing/staff retention, finance, and improvement. Top-down communication, staff training, administrator presence in the clinic, and curricular implementation were noted challenges to patient safety:

> "There should be a more reliable and efficient means for clinical administration staff to communication with clinicians/interns. . ." (*Student, Program B-205*)

"Appropriately train staff so they are fully aware of all requirements and procedures." (*Faculty, Program C-009*)

"Presence of the clinic director every day of the week, and all day." (*Faculty, Program A-812*)

"Implement what is planned in the curriculum." (*Faculty, Program A-804*)

Patient-Centered*,* or health care delivered with respect to the needs, preferences, goals, and desired outcomes of the patient*,* emerged from responses to all 4 questions, and was prominent in statements by students and faculty clinician to the clinical setting question. Crosswalked codes also include *patient-centered care*, *patient experience*, and *patient-facing communication*, with *stakeholder input* serving as a unique code under this theme. One student described the importance of doing what is "right for the patient" (*Student, Program D-591*). Another stressed the value of making sure patients feel "comfortable and safe" (*Student, Program D-471*). Learning to talk with patients about adverse events was an important place to start:

> "I feel that I sometimes scare people when I talk about adverse events when, actually, I am just trying to educate them on the risks to protect them and myself. But I just don't think we have the tools to actually talk about these things in a matter *(sic)* that doesn't scare people away." (*Student, Program B-238*)

Shifting the focus from the doctor to the patient would lead to a "better learning environment and patient experience." (*Student, Program D-432*) A faculty member agreed:

"Procedures are taught, but there is somewhat of a focus for the students on reaching targets which can sometimes take some of the focus off the actual patient, and patient centered care." (*Faculty, Program C-030*).

Supplementary File 2 provides an additional report of our qualitative results with representative quotes.

DISCUSSION

A recent call to action by the World Federation of Chiropractic Global Patient Safety Task Force encourages chiropractors to "create opportunities to improve patient safety across professional organizations, health systems and clinics, and educational settings" (p. 2).[19] This qualitative analysis from a mixed methods survey identified such opportunities in the suggestions to enhance patient safety culture from clinic partners in chiropractic programs from 4 different countries. Our team previously reported on select patient safety domains (education, clinical setting, communication, and leadership) that had helped explain the quantitative dimensions of our previous SafetyNET survey study.[9] In this current study, 460 respondents expanded on those 4 domains to provide a broader depiction of patient safety culture in these training settings. We identified 8 themes in our qualitative analysis: Accountability, Transparency, Safety Education, Safety Reporting, Risk Management, Clinical Standards, Administrative Oversight, and Patient-Centered. These themes integrated as the dynamic *Safety Compass Model of Patient Safety Culture in Chiropractic Teaching Clinics* (Fig. 2).

The Safety Compass Model recognizes the myriad complexities of teaching novice practitioners about patient safety in the unique health care settings of chiropractic teaching clinics, which can range from recognition of adverse events to instituting and auditing reporting processes to learning from cases of rib fractures to addressing infection control concerns during a global pandemic.[9,20–22] Chiropractic clinic partners in our study, including student interns, faculty clinicians, and staff, described many instances in which solutions to patient safety culture issues required solutions from multiple domains. For example, professional *accountability* and organizational *transparency* emerged as central themes to address, and important values to teach, in our 4 research questions. While the role that higher education has regarding accountability is evident, the teaching of it is less clear.[23] As noted in a similar qualitative analysis as the initial study, *accountability* within patient safety can be seen as "doing our best for patient safety" without measurable action items among practicing clinicians.[14] *Transparency* and communication skills also are essential to health care practices.[24] According to the United States National Patient Safety Foundation, *transparency* in all actions, particularly among organizational leadership, is fundamental to cultivating a patient safety culture.[25] Student interns in the current study called on faculty clinicians to demonstrate *accountability* by talking about their own experiences with patient safety concerns and for chiropractic teaching clinics to assure *transparency* by instituting regularly scheduled safety rounds. These suggestions align well with common safety practices in other health care settings.[26,27]

In addition to faculty in-services on safety topics and student involvement in safety-related activities,[9] this analysis included a fundamental desire among respondents for core elements of *safety education*. Although patient safety curricula exist,[28,29] the optimal training program has yet to be identified, particularly for professions that teach manual therapy. A negative perspective toward patient safety within medical training programs has been observed. Addressing this issue is crucial, as it can influence clinical practice in the long term.[30] Consistency between curricula within the academic and experiential training could be a first step and was demonstrated as a desire through respondents' statements on "curricular reform" and "inconsistent/insufficient education." Experiential learning opportunities, "informational videos" for patients, and demonstrations of successful communication in teaching clinics, were desired across clinic partner groups.[31]

The change from academic coursework to clinical training is a known pivotal and challenging transition.[32] Therefore, it is no surprise that *clinical standards* was a theme that arose from the questions with statements requesting training on basics, such as "clinic hygiene," as well as on more "standards of care," "procedures," and "privacy." As our survey was collected during the height of the global coronavirus pandemic, we were not surprised to see "clinic hygiene" as an integral facet of patient safety, as infection control practices were mentioned by chiropractors working in other clinical settings during COVID-19 and in previous studies of infectious pathogens and hand hygiene in chiropractic teaching clinics.[33–36]

Regarding other standards of care, *safety reporting* emerged as its own significant theme. Similar to other health care professions, the majority of students and faculty desire to have a patient safety reporting procedure or system. However, when such a system is in place, only a minority actually report according to protocol.[37] When the feasibility of an active surveillance reporting system was assessed in 1 of the same teaching clinics participating in this study, similar barriers related to protocol adherence were noted and need to be addressed in future studies.[38] Safety reporting procedures and documentation practices are essential to create and sustain *risk mitigation* strategies. Documentation processes shifted from our previous study and the idea of completing "paperwork" to documenting care within "electronic health records/software," suggests more widespread adoption of these technologies, including in chiropractic training settings and, perhaps, opportunities to improve patient *safety reporting* systems through these more transparent systems.[9,39–41]

Management and leadership are often seen as the same entity, especially for achieving organizational goals.[42] This study identified *administrative oversight* as a core theme, which included codes such as "management" and "procedures." This indicates that respondents recognize the need for leadership to foster and maintain a transparent and accountable environment to support a strong patient safety culture. *Patient-centered care,* including *patient experience,* represented another survey theme that was related to Communication. While patient-centered care has been seen as a factor in health care quality, it has recently been shown to have an impact on patient safety, specifically the importance that patient safety is not just about the provider but includes the active participation of patients.[43] Similar to this study's findings, other international studies have found that patient-centered attitudes at chiropractic teaching clinics need to be improved.[44]

Strengths and Limitations

A strength of this project was the robust data collection effort using a validated survey instrument, data analysis using a multidisciplinary team with both novice and expert researchers from several institutions, member checking, and audit trails, which allowed for credibility and trustworthiness of data analysis, qualitative questions derived from our previous work, and recruitment from chiropractic programs from 4 different countries, allowing our findings to further establish the ubiquity of patient safety concerns among clinic stakeholders and across chiropractic educational settings.[9] Unfortunately, the participating educational institutions differed between our first SafetyNET survey study and this one. This means we could not assess how these clinical partners' institutional perceptions of patient safety culture are evolving.

While this study gathered insights from chiropractic students, faculty clinicians, and clinic staff, there was a disproportionate number of student intern responses due to their higher numbers overall. This imbalance arose because the survey sought feedback from all individuals currently engaged in the teaching clinic setting within these target populations at the time of the survey. If the goal had been to compare responses across groups, probability sampling would have been used. However, for the purposes of this survey, we ensured that themes were identified across all populations, as evidenced by the sample quotes from each group in Supplementary File 2.

Furthermore, although we captured valuable insights from key clinical partners in these chiropractic teaching clinics, we did not gain insights from other patient safety partners, such as program or clinic administrators, who may offer important feedback on this topic. We also did not elicit patient perceptions, which is a major limitation of this study, and within chiropractic patient safety research broadly, where a paucity of patient perspectives persists.[23,45,46] The World Health Organization *Global Patient Safety Action Plan (2021–2030)*[3] emphasizes patient and family engagement in patient safety initiatives to learn from their experiences and co-develop patient-centered policies, procedures, and practices to prevent avoidable harm in health care. Our future studies will seek patient input on patient safety culture in chiropractic teaching clinics.

Overall, there were variations in response rate across participating institutions, with Program C presenting lower rates. The limited response rate might be related to survey burden, available time, or lack of opinions about the topic. Compared to our previous survey,[9] a higher percentage of respondents replied to the open-ended questions perhaps due to their more focused topics, which is another strength. However, these answers were brief in length and often echoed the topics suggested in the questions themselves. Respondents also found creative ways to skip the required question or answered "none", "don't know", or "not applicable". These limited responses may be due to the overall survey length (80+ questions), time allotted for the study, lack of incentives, or no interest in the subject matter.

Responses to the leadership question were very brief and highlighted the need for "more", "better", or "improved communication" without offering enough contextual detail to understand fully the meanings of respondents. This gap may be respondent fatigue due to question placement at the end of the survey but may also be related to respondents' lack of appreciation for, or knowledge about, the role of administrators in clinic settings. However, a lack of information about clinic leadership may indicate that there are few organizational policies and procedures for patient safety processes, or that stakeholders do not feel empowered to critique the efforts of their leaders. Future studies might consider ethnographic methods such as participant observation and interviews to better understand how patient safety culture is practiced in these educational settings.

CONCLUSION

Students, faculty clinicians, and clinic staff from chiropractic programs from 4 different countries suggested areas for improvement in patient safety culture within their institutions. Respondents emphasized patient-centered health care, professional accountability, and institutional transparency regarding patient safety events. Safety education and safety reporting should ensure that both chiropractic training and chiropractic care are provided in the safest manner possible. Adherence to clinical standards, risk mitigation actions to reduce adverse events, privacy breeches and other avoidable harms, and administrative oversight of program and procedure implementation also were identified as necessary features of robust patient safety cultures in chiropractic training settings.

ACKNOWLEDGMENTS

We thank Dr Sasha Aspinall who served as site investigators/liaisons during survey implementation. We also thank Dr Michelle Holmes, AECC University College, who was a key investigator for the first round of this survey and instrumental in setting up this data collection and methodology. We thank Ms Shannon Cartee, Palmer College of Chiropractic, for her graphic design expertise in making the figures for this manuscript.

FUNDING AND CONFLICTS OF INTEREST

The project received the in-kind support of Palmer Center for Chiropractic Research, Canadian Memorial Chiropractic College, and Parker University. Stacie Salsbury reports research funding unrelated to this work from the National Institutes of Health – National Center for Complementary and Integrative Health. Stacie Salsbury serves in a voluntary capacity for the World Federation of Chiropractic Research Committee and Global Patient Safety Task Force. Stacie Salsbury is a member of the editorial board of the *Journal of Chiropractic Education*. Katherine Pohlman reports research funding unrelated to this work from several nonfederal agencies. Katherine Pohlman serves in a voluntary capacity for the World Federation of Chiropractic Research Committee and the Chiropractic Future Research Workgroup. Martha Funabashi reports research funding unrelated to this work from the Canadian Tri-Council New Frontiers and Research Fund and other nonfederal agencies.

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Concept development: SAS, MF, KAP. Design: SAS, MF, KAP. Supervision: SAS, MF, AL, KAP. Data collection/processing: MF, KAK, CB, BP, KAP. Analysis/interpretation: SAS, KAK, VW, AB, AL, CB. BP, ES, MM, KAP. Literature search: SAS, KAP. Writing: SAS, KAK, VW, AC, KAP. Critical review: SAS, MF, KAK, VW, AB, AL, CB, BP, ES, MM, KAP. Other, Figure Creation: SAS.

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