

# SafetyNET Community-based patient safety initiatives: development and application of a Patient Safety and Quality Improvement Survey

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**Objectives:** *To: 1) develop/adapt and validate an instrument to measure patient safety attitudes and opinions of community-based spinal manipulative therapy (SMT) providers; 2) implement the instrument; and 3) compare results among healthcare professions.*

**Methods:** *A review of the literature and content validation were used for the survey development. Community-based chiropractors and physiotherapists in 4 Canadian provinces were invited.*

**Results:** *The Agency for Healthcare Research and Quality's (AHRQ) Medical Office Survey on Patient Safety Culture was the preferred instrument. The survey was modified and validated, measuring 14 patient safety dimensions. 276 SMT providers volunteered to respond to the survey. Generally, SMT providers had similar or better patient safety dimension scores compared to the AHRQ 2016 medical offices database.*

**Discussion:** *We developed the first instrument measuring patient safety attitudes and opinions of community-based SMT providers. This instrument provides understanding of SMT providers' opinions and attitudes on patient safety and identifies potential areas for improvement.*

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**KEY WORDS:** chiropractic, patient safety, survey, spinal manipulation

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## Introduction

Patient safety is a leading healthcare challenge.<sup>1</sup> In 1999, the U.S. Institute of Medicine's *To Err is Human: Building a Safer Health System*<sup>2</sup> report advised the development and sustainability of an open and constructive patient safety culture. In 2002, the Canadian government's *Building a Safer System: A National Integrated Strategy for Improving Patient Safety in Canadian Health Care*<sup>3</sup> supported and emphasized the need for leadership with

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**Objectifs :** *1) Élaborer/adapter et valider un instrument servant à évaluer les attitudes à l'égard de la sécurité du patient et les opinions des praticiens effectuant des manipulations vertébrales (MV); 2) adopter cet instrument; et 3) comparer les résultats obtenus entre les professionnels de la santé.*

**Méthodologie :** *Pour élaborer le sondage, on a revu la littérature, on a validé le contenu et on a invité des chiropraticiens et des physiothérapeutes de quatre provinces canadiennes à participer.*

**Résultats :** *Le Medical Office Survey on Patient Safety Culture de l'Agency for Healthcare Research and Quality's (AHRQ) était l'instrument préféré. Le sondage a été modifié et validé et a servi à mesurer 14 aspects de la sécurité du patient. 276 professionnels effectuant des MV ont accepté de répondre au sondage. En règle générale, les cotes obtenues chez les professionnels effectuant des MV pour ce qui des aspects de la sécurité étaient comparables ou meilleurs que celles des professionnels de la santé enregistrés dans la base de données de 2016 de l'AHRQ.*

**Discussion :** *On a élaboré le premier instrument servant à évaluer les attitudes à l'égard de la sécurité et les opinions des praticiens effectuant des MV dans une collectivité. Cet instrument permet de comprendre les opinions et les attitudes à l'égard de la sécurité du patient des professionnels effectuant des MV et de cerner les aspects qui pourraient être améliorés.*

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**MOTS CLÉS :** chiropratique, sécurité du patient, sondage, manipulation vertébrale

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this challenge. These reports laid out comprehensive strategies to reduce preventable medical errors, which did not focus on individuals making the error, but rather on how the systems, processes and conditions fail to prevent the error.<sup>4</sup>

One strategy to promote and understand a healthcare organization's existing patient safety culture is by assessing its current attitudes and opinions toward safety.<sup>4</sup> Although several surveys currently exist to assess attitudes

and opinions, most are designed for large, acute care settings rather than community-based health care environments. As the majority of people receive care in community-based settings, further information about community-based health care providers' behaviors, attitudes, and opinions about patient safety is needed.<sup>5</sup>

Spinal manipulative therapy (SMT) is a therapeutic intervention commonly used by chiropractors and physiotherapists and perceived to carry added risks to patients with varying evidence regarding the incidence of associated adverse events (AEs).<sup>6</sup> It is estimated that 4.5 million Canadians and over 50% of Americans receive SMT per year.<sup>7,8</sup> Despite SMT's popularity, few formal patient safety and reporting mechanisms are available<sup>5</sup>, increasing the need for specific SMT-related patient safety initiatives. As most SMT is provided in community-based offices/clinics<sup>9</sup>, having a patient safety survey specifically for these settings is essential.

SafetyNET is an international and multidisciplinary research team, whose primary goal is to support strategies that promote a patient safety culture among SMT providers.<sup>10</sup> Although AEs following SMT intervention have been described to vary widely in severity and frequency, no robust causal inferences have been made.<sup>6,11,12</sup> Thus, systematic reviews investigating SMT-related AEs have called for more research.<sup>13,14</sup>

To date, only a few patient safety mechanisms, such as reporting and learning systems, exist to systematically monitor and reduce SMT-related harms.<sup>15</sup> With the call for more research and few patient safety measurement options, there is a need to measure and assess current patient safety attitudes and opinions. Therefore, our study aimed to: 1) develop or adapt an assessment tool to measure patient safety attitudes and opinions of community-based SMT providers, specifically chiropractors and physiotherapists; 2) validate this assessment tool; 3) implement this tool with community-based chiropractors and physiotherapists who apply SMT; and 4) compare the resultant scores against other healthcare professions.

## Methods

### *Survey Development*

We conducted a literature review with assistance of a health sciences librarian who is expert in scoping reviews to identify available patient safety surveys and their

applicability to the SMT setting. Searches were conducted in Google, Google Scholar, and PubMed. Search terms included: 'patient safety survey', 'patient safety culture', and 'patient safety climate'; in conjunction with 'community-based', 'ambulatory', 'medical offices', and 'general practice'. Based on consultation with subject matter experts on our research team, surveys specific for SMT professions were not expected and, therefore, terms related to 'chiropractic', 'physiotherapy', 'manual therapy' or 'spinal manipulative therapy' were not included in the search. In addition to the electronic databases, content experts on the research team were also queried for suggested relevant surveys. All citation abstracts were screened and assessed by the SafetyNET team members to evaluate their relevance to the following criteria: 1) addressed the research question; 2) measurement properties established (i.e., with reported validity and reliability); 3) ease of use (i.e., lack of patient safety jargon, manageable number of sections, each section was not too long); and 4) estimated number of necessary modifications (although this was not a determinant factor).

Relevant surveys (Table 1) were independently assessed by eight SafetyNET multidisciplinary team members with expertise in SMT, epidemiology, patient safety and/or survey development. Feedback was summarized and presented to all 22 expert SafetyNET team members. The preferred survey was identified by consensus and modifications were made to meet our study needs using an iterative consensus-based process.

The final stage involved content validation adhering to the CONsensus-based Standards for the selection of health status Measurement INSTRUMENTS (COSMIN) checklist.<sup>16</sup> A face-to-face qualitative focus group was conducted to evaluate the relevance and comprehensiveness of the modified survey with a convenience sample of volunteers attending a chiropractic educational conference in Edmonton, Alberta. Then, a feasibility assessment of the survey was conducted by circulating it amongst SMT providers to further evaluate the content and face validity, the functionality and time to complete the survey.

### *Survey Application*

The final survey was created using a standardized Research Electronic Data Capture (REDCap) database. REDCap is a secure, web-based application designed to support data capture for research providing an intuitive

Table 1.

Surveys identified during the literature review that evaluate patient safety attitudes and opinions in ambulatory settings.

Author / Year	Manuscript Title	Purpose	Setting / Location	Population Studied (sample size)	Survey Items and Dimensions / Factors
de Wet <i>et al.</i> , 2010 <sup>22</sup>	The development and psychometric evaluation of a safety climate measure for primary care	To measure perceptions of safety climate among primary care teams outside of North America.	Primary care teams in National Health Service, Scotland	563 primary care team members from 49 general practices	30 items, measuring 5 safety climate factors: 1) Leadership, 2) Teamwork, 3) Communication, 4) Workload, 5) Safety Systems.
Hoffman <i>et al.</i> , 2011 <sup>21</sup>	The Frankfurt Patient Safety Climate Questionnaire for General Practices (FraSiK): analysis of psychometric properties	To measure patient safety climate in practices with only 1-2 doctors, who are owners with 2-4 other professional employees (small offices).	General practice in Germany	332 healthcare professionals working in 60 general practices	72 items, measuring 9 dimensions: 1) Teamwork climate, 2) Error management, 3) Safety of clinical processes, 4) Perception of causes of errors, 5) Job satisfaction, 6) Safety of office structure, 7) Receptiveness to healthcare assistants, 8) Patient safety of medical care. {Adapted from the SAQ-A}
Modak <i>et al.</i> , 2007 <sup>20</sup>	Measuring safety culture in the ambulatory setting: the Safety Attitudes Questionnaire (SAQ)- Ambulatory Version (SAQ-A)	To measure safety attitudes of outpatient settings.	Academic, urban, outpatient practice in Texas, United States	251 outpatients providers (physicians, nurses, managers, medical assistants and support staff)	62 item survey, measuring 6 factors: 1) Teamwork climate, 2) Safety climate, 3) Perceptions of management, 4) Job satisfaction, 5) Working conditions, 6) Stress recognition.
Sorra <i>et al.</i> , 2016 <sup>18</sup>	Medical Office Survey on Patient Safety Culture- User Guide	Modification of the <i>AHRQ Hospital Survey on Patient Safety Culture</i> . Emphasized safety and quality issues that are known to affect patient safety in medical offices.	Medical Offices in the United States	Pilot tested in 2007 with 200 offices, > 4,100 surveys. First released in 2009, with comparable databases released approximately every 2 years.	51 item survey, measuring 13 dimensions: 1) Teamwork, 2) Work pressure and pace, 3) Staff Training, 4) Office processes and standardization, 5) Communication openness, 6) Patient Care Tracking / Follow-up, 7) Communication about error, 8) Owner / Managing Partner / Leadership support for patient safety, 9) Organizational learning, 10) Overall perceptions of patient safety and quality, 11) List of patient safety and quality issues, 12) Information exchange with other settings, 13) Overall ratings on quality and patient safety.

interface for validated data entry, audit trails for data manipulation, and export procedures.<sup>17</sup> Invitation to participate in survey completion was distributed via email to Canadian community-based chiropractors and physiotherapists from four different Canadian provinces through their respective provincial associations.

### Survey Data Analysis

Data on patient safety culture dimensions were analyzed in two ways using Stata13 Software (StataCorp. 2013)

and Excel 2013. First, a positive percentage composite score was calculated for each dimension by averaging the percent positive responses on the questions within each dimension. For negatively worded questions, disagreeing was considered a positive response. Second, survey dimensions' scores were calculated based on the mean response to the five-point scale and its 95% confidence interval (CI). Pearson chi-square test was used to compare the scores from SMT providers with the AHRQ medical offices comparative database, with level of significance

at  $p=0.05$ . Each dimension required that all questions be answered to be included. Frequencies of responses were calculated for factors inhibiting participation in a reporting and learning system, patient safety items and quality issues, information exchange with other settings, and overall clinic self-ratings.

### Comparative Database

The Medical Office Survey on Patient Safety Culture is an expansion of AHRQ's Hospital Survey on Patient Safety Culture to the medical office setting. Its content has been extensively tested for validity and reliability, and it has been in use since 2004.<sup>18</sup> It was designed to measure the culture of patient safety in medical offices from the perspective of providers and staff. The Medical Office Survey on Patient Safety Culture 2016 User Comparative Database has been previously described.<sup>19</sup> Briefly, it consists of data from 1,528 medical offices located across the United States and 25,127 medical office respondents from varied specialties who completed the survey between 2013 and 2015. This comparative database report was developed as a tool for comparison of survey results, internal assessment, and to provide supplemental information to help offices/clinics identify their strengths and areas with potential for improvement.

## Results

### Survey Development

The literature review identified four commonly used surveys that assessed patient safety attitudes and opinions in community-based settings (Table 1).<sup>18,20-22</sup> The AHRQ Medical Office Survey on Patient Safety Culture was identified as the team's preferred instrument.<sup>18</sup>

Based on feedback from the SafetyNET team, the following modifications were made to the AHRQ medical office survey: 1) the word 'medical' was removed, and, replaced with 'clinical' or 'office'; 2) for 'Organizational Learning' and 'Overall Perceptions of Patient Safety and Quality' each question was asked regarding its clinical and administrative perspective; 3) in the 'Overall Rating' section, *socioeconomic status* was removed from 'Equitable' as the team felt it should not be grouped with the other qualities listed (i.e., gender, race, ethnicity, language) considering SMT is a non-insured service in Canada and access may be affected differently than these other

qualities. *Socioeconomic status* was therefore developed into a separate question looking at 'To what degree do the following affect your care plan' with the addition of: 'Insurance coverage'; 'Patient accessibility to the office'; and 'Other (specify)'; and 4) a section on 'Reporting and Learning System Barriers', based on questions adapted from Benn *et al.* (2009)<sup>23</sup> was added. A brief description of the dimensions of the survey as well as the modifications made to the AHRQ medical office survey can be found in Table 2. The full modified survey is available from the authors upon request.

Chiropractors who participated in the focus group (n=24 of 63) stated that the survey was lengthy, but the information obtained would be valuable. They also felt that some questions would be better in different locations to promote response, and that some required additional clarification. Consequently, the following survey items were further modified: 1) the more sensitive section (i.e., List of Patient Safety and Quality Issues) was moved towards the end of the survey; 2) definitions were added to help clarify terminology differences amongst SMT professions (e.g., manual therapy, manipulation, adjustments); 3) modifications were made for each profession, reflecting the language/culture of each responding group (e.g., "office" versus "clinic"); and 4) the title of the survey was changed to 'Survey to Support Quality Improvement', to add clarity for the survey's purpose.

These actions resulted in two versions of the 'Survey to Support Quality Improvement', one for chiropractors and one for physiotherapists. Both surveys have 14 dimensions with seven derived directly from the AHRQ Medical Office Survey on Patient Safety Culture, six from the AHRQ Medical Office Survey with some modified questions, and one dimension unique for this survey added by the SafetyNET team (Table 2).

## Survey Application and Comparison

### Participant Response

A total of 417 SMT providers volunteered to respond to the survey: 356 chiropractors and 61 physiotherapists. Surveys from 120 chiropractors and 21 physiotherapists were excluded due to missing responses to questions (no complete section). We included 276 surveys, with complete data from 236 chiropractors (85.5%) and 40 physiotherapists (14.5%).

Table 2.

*AHRQ's survey dimensions and description, reliability measures, and modifications made for the SafetyNET survey.*

Dimensions	Dimension brief description <sup>18</sup>	# of items	AHRQ Cronbach's alpha	SafetyNet modifications
List of Patient Safety and Quality Issues	Issues that can happen in clinical offices that affect patient safety and quality of care.	8	0.86	Removed 'A pharmacy contracted our office to clarify or correct a prescription.'
Information Exchange with Other settings	How often the office had problems exchanging accurate, complete, and timely information with other entities.	4	0.90	Removed 'Pharmacies' and 'Hospitals'. Added 'Other healthcare offices' and 'Insurance / Third Party Payers?'
Teamwork	The extent to which the office has a culture of teamwork, mutual respect, and close working relationships among staff and providers.	4	0.83	No Changes
Work Pressure and Pace	The extent to which there are enough staff and providers to handle the patient load, and the office work pace is not hectic.	4	0.76	No Changes
Staff Training	The extent to which the office gives providers and staff effective on-the-job training, trains them on new processes, and does not assign tasks they have not been trained to perform.	3	0.80	No Changes
Office Processes and Standardization	The extent to which the office is organized, has an effective workflow, has standardized processes for completing tasks, and has good procedures for checking the accuracy of work performed.	4	0.77	No Changes
Communication Openness	The extent to which providers in the office are open to staff ideas about how to improve office processes, and staff are encouraged to express alternative viewpoints and do not find it difficult to voice disagreement.	4	0.81	No Changes
Patient Care Tracking / Follow-up	The extent to which the office reminds patients about appointments, documents how well patients follow treatment plans, follows up with patients who need monitoring, and follows up when reports from an outside provider are not received.	4	0.78	No Changes
Communication About Error	The extent to which providers and staff are: 1) willing to report mistakes they observe and do not feel like their mistakes are held against them, and 2) talk openly about office problems and how to prevent errors from happening.	4	0.75	No Changes
Owner / Managing Partner / Leadership Support for Patient Safety	The extent to which office leadership actively supports quality and patient safety, places a high priority on improving patient care processes, does not overlook mistakes, and makes decisions based on what is best for patients.	4	0.76	No Changes
Organizational Learning	The extent to which the office has a learning culture that facilitates making changes in office processes to improve the quality of patient care and evaluates changes for effectiveness.	6	0.82	Separated each question into administrative / clinical parts.
Overall Perceptions of Patient Safety and Quality	The extent to which the quality of patient care is more important than getting more work done, office processes are good at preventing mistakes, and mistakes do not happen more than they should.	8	0.79	Separated each question into administrative / clinical parts.
Overall Ratings on Quality and Patient Safety	Overall rating of care, systems and clinical processes the office has in place to prevent, catch, and correct problems that have the potential to affect patients.	9	0.87	Separated 'patient's socioeconomic status', 'insurance coverage', 'patient accessibility to the office', and 'other' into individual categories.
Factors inhibiting participation in a reporting and learning system	Not part of AHRQ. {Adapted from Benn <i>et al.</i> <sup>24</sup> }	9	NA	Not part of AHRQ. {Adapted from Benn <i>et al.</i> <sup>24</sup> }

*AHRQ – Agency for Healthcare Research and Quality*

Table 3.  
Demographic and background characteristics of responding SMT providers. (n=276)

Provider Characteristics	SMT Providers
Gender, Female, n (%)	77 (27.9%)
Years in practice, Mean (range)	19.4 (1-53)
Hours worked in a typical week, Mean (range)	31.6 (4-55)
Average number (range) of personnel working in the clinic	
Other health care provider	3.1 (1-10)
Therapy Assistant	2.7 (1-10)
Other employee/ staff	2.4 (1-6)
Patient visits per week, n (%)	
< 50	45 (16%)
50-99	74 (26.8%)
100-149	44 (15.9%)
150-199	25 (9%)
Highest level of non-physiotherapy / non-chiropractic degree, n (%)	
Bachelor's degree	148 (53.6%)
Master's degree	13 ( 4.7%)
Academic Doctoral degree	8 ( 2.9%)
Other	14 ( 5 %)
Province of practice, n (%)	
Newfoundland and Labrador	31 (11.2%)
New Brunswick	15 ( 5.4%)
Ontario	190 (68.8%)
Alberta	40 (14.5%)

### Respondent and Patient Characteristics

Table 3 provides a summary of demographic characteristics of respondents. Respondents were predominantly male (72.1%), providing treatment for an average of 31.6 hours per week, and treating less than 100 patients per week.

### Patient Safety Culture Dimensions

In Figure 1, composite scores are contrasted with the AHRQ 2016 comparative database. With the exception of Patient Care Tracking/Follow-up scores, all other scores were greater than the AHRQ database. Specifically, Work

Table 4.  
Providers opinions on factors that may inhibit participation in a reporting and learning system.

Factors inhibiting RLS participation	Not at all	Yes, a little	Yes, a lot
<b>Patient Concerns</b>			
Perceived inconvenience for the patients	22%	51%	27%
Potential to create negative perception in patients	26%	49%	25%
<b>Office Concerns</b>			
Time pressure	11%	42%	46%
Lack of clear definitions as to what constitutes a reportable incident	32%	55%	14%
Resource constraints	65%	28%	7%
<b>Big Picture Concerns</b>			
Regulatory implications	41%	42%	17%
Legal implications	36%	47%	17%
Fear of blame	57%	38%	5%
Believe reporting is unnecessary	65%	32%	3%
RLS – Reporting and Learning System			

Pressure and Pace, Office Processes and Standardization, and Overall Perception of Patient Safety – Clinical scored statistically significantly higher than the AHRQ database.

### Factors Inhibiting Participation in a Reporting and Learning System

Perceived barriers to participation in a patient safety reporting and learning system are summarized in Table 4. Time pressure was identified as the biggest limitation, with patient concerns (i.e., perceived inconvenience for the patients and potential to create negative perception in patients) being the next most frequently reported limita-

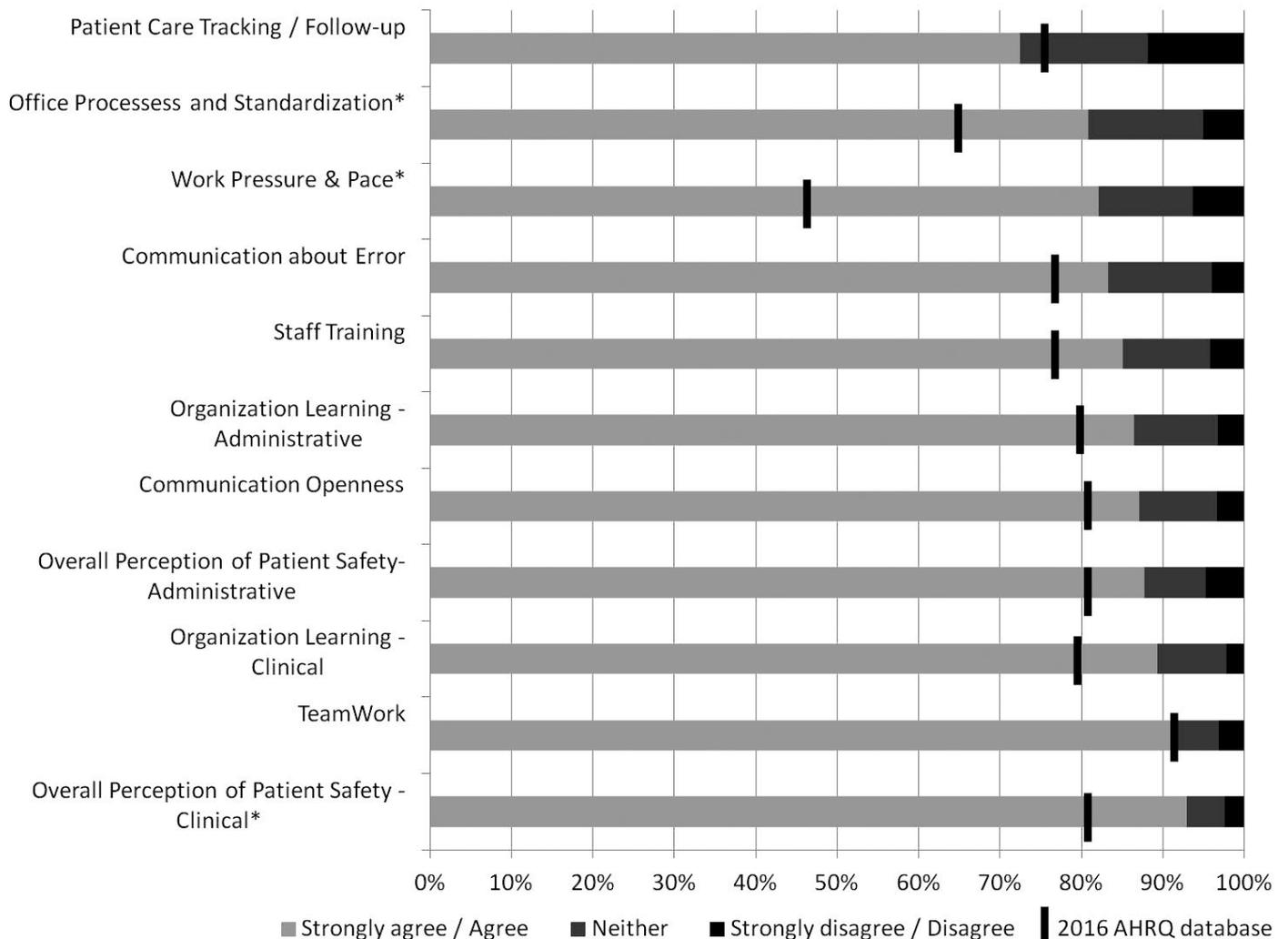


Figure 1.

The positive composite scores from the patient safety dimensions are presented for SMT providers who responded to the survey and the 2016 AHRQ comparative database. Asterisks indicate dimensions that the percentage of positive composite scores for “strongly agree/agree” responses from SMT providers were significantly different than the ones from the 2016 AHRQ medical offices comparative database.

tion. A modest level of concern was reported regarding potential regulatory and legal implications. Most (57%) reported the fear of blame was not a barrier to reporting potential AEs.

#### Patient Safety Items and Quality Issues/Information Exchange with Other Settings

In comparison to the AHRQ database, SMT providers who responded to the survey had higher scores in most

other items (Table 5). The SMT providers scored statistically significantly lower than medical offices in items related to medication list being updated and abnormal lab or imaging test not being followed up within one business day. Scores related to the use of the wrong patient chart, a chart not being available, clinical information filed into the wrong chart, and equipment not working properly were similar to scores in the AHRQ medical office 2016 database (< 5% difference).

Table 5.

Composite-level average percent positive response by number of providers. A desirable outcome corresponds to a high percentage value, which represented less frequency of occurrence.

Dimension	Composite Mean %	AHRQ – 2016
<b>Patient safety items and quality issue</b>		
Access to care: A patient was unable to get an appointment within 48 hours for an acute/serious problem.	89%	90%
Patient identification: The wrong chart/record was used for a patient.	95%	97%
Charts/Records: A patient’s chart/record was not available when needed	91%	90%
Charts/Records: Clinical information was filed, scanned, or entered into the wrong patient’s chart/record	94%	89%
Equipment: Equipment was not working properly or was in need of repair or replacement	95%	92%
Medication: A patient’s medication list was not updated during his or her visit.	56%*	80%
Diagnostics Test: Results from a lab or imaging test were not available when needed	82%*	70%
Diagnostics Test: Critical abnormal result from a lab or imaging test was not followed up within 1 business day	66%*	94%
<b>Difficulty with Information Exchange with Other Setting</b>		
Outside labs / imaging centers	91%	82%
Other physician clinics (AHRQ: Other medical offices / outside physicians)	89%*	77%
Other healthcare clinic	92%	NA
Insurance / Third Party Payers	70%	NA
Other (i.e. Worker’s Compensation Board, employers of patients, schools)	76%	NA
AHRQ 2016 – 2016 Agency for Healthcare Research and Quality medical offices comparative database * – Significantly different than 2016 AHRQ database scores		

Respondents described the greatest difficulty in exchanging information with other healthcare clinics. While information exchange with outside labs/imaging centers was comparable, information exchange difficulty with other physician clinics was statistically significantly higher than the AHRQ medical office 2016.

**Overall Clinic Self-Ratings**

In Table 6, overall clinic self-ratings dimensions for respondents were found to be statistically significantly higher than the AHRQ medical office 2016 database; however, the overall clinic rating was comparable. Items that affect a patient’s care plan were found to be equally distributed for items measured. Other items that were described as affecting the patient’s specifically designed care plan were: patient’s desire to follow care plan, patient’s expectations, and patient’s level of discomfort.

**Discussion**

**Survey Development**

As expected, our literature review did not retrieve a specific instrument developed for SMT providers, but it identified an existing validated survey used for other healthcare professions did meet our criteria. The selected survey tool, AHRQ’s *Medical Office Survey on Patient Safety Culture* was adapted and minimally modified for SMT providers, allowing comparison of 14 patient safety dimensions with AHRQ medical office 2016 database.

A previous review of several patient safety surveys, including the AHRQ Medical Office Survey on Patient Safety, concluded that survey results should be interpreted with caution as there was no established link with improved patient outcomes.<sup>24</sup> However, another recent systematic review reported a trend demonstrating a positive relationship between patient safety culture and patient

Table 6.  
Providers' perception of overall clinic self-rating.

Dimension	Poor	Fair	Good	Very Good	Excellent
<b>Patient centered</b>	0%	2%	12%	34%*	52%*
AHRQ 2016	0%	7%	27%	36%	30%
<b>Timely</b>	1%	3%	20%	41%*	35%*
AHRQ 2016	7%	13%	31%	35%	15%
<b>Efficient</b>	0%	1%	20%	43%*	36%*
AHRQ 2016	3%	9%	26%	45%	18%
<b>Equitable</b>					
Patient: gender, race, ethnicity, language, etc	0%	0%	5%	34%*	61%*
AHRQ 2016: gender, race, ethnicity, socioeconomic status, language etc.	1%	5%	15%	27%	52%
<b>Overall clinic rating to prevent, catch, and correct problems that have the potential to affect patients</b>	1%	5%	27%	46%	21%
AHRQ 2016	1%	7%	26%	49%	18%
*– Significantly different than 2016 AHRQ database for the same scores					
<b>How do the following dimension affect patient's specifically designed care plan?</b>	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>Most of the time</b>	<b>Always</b>
<b>Socioeconomic status</b>	22%	22%	40%	10%	5%
<b>Insurance coverage</b>	32%	20%	33%	11%	4%
<b>Patient's accessibility to clinic</b>	26%	28%	34%	9%	3%
<b>Other</b>	9%	9%	55%	18%	9%
AHRQ – Agency for Healthcare Research and Quality AHRQ 2016 – 2016 AHRQ medical offices comparative database					

outcomes in hospital settings but this was not statistically significant.<sup>25</sup> In high-risk industries, an open constructive safety environment was found to lead to high employee safety compliance and better organizational performance.<sup>26</sup> The need to understand patient safety attitudes and opinions through the use of cross-sectional surveys may help researchers, patient safety personnel, and administrators identify areas of strengths and those in need of improvement with an aim to increasing positive patient outcomes and reducing medical error, despite the lack of current evidence for this result.

### Survey Application

We present the first study to measure community-based SMT providers' patient safety attitudes and opinions. The patient safety dimension of 'work pressure & pace' scored greater than the AHRQ comparative data base, indicating that respondents often felt rushed and that they may have

too many patients for the amount of time available. This was also observed in medical offices regardless of the job position<sup>27</sup>, indicating the need for processes and systems to accommodate the busy work-load and to reduce potential staff burnout<sup>27</sup>.

Similar to other healthcare professions, this survey found that 'time pressure and lack of clear reportable incident definitions' were the largest concern of SMT providers in participating in a reporting system.<sup>23,28</sup> Time pressure was an expected finding, as healthcare providers often have competing demands for their time and perceive themselves as "too busy" to report incidents<sup>5,28,29</sup>, emphasizing the importance of 'ease of use' when developing an evaluation system. Although "busyness" is a socially acceptable excuse for non-participation in incident reporting systems, patient safety is one of the most prominent healthcare challenges and improving health care is a shared responsibility that must include health

care providers, researchers and patients to be successful.<sup>1</sup>

‘Lack of a clear definition for reportable incident’ has been identified in previous studies among chiropractors and other professionals utilizing SMT.<sup>5,28,30</sup> More specifically, a qualitative study with SMT providers observed that not only was defining AEs following SMT challenging, but also that the perceived difficulty of tracking these events would exceed the benefits of having the reported information.<sup>31</sup> Similar to our survey findings, a systematic review focusing on clinical incident reporting suggested having a standardized definition of an AE, along with clearly described reporting methods, including mechanism, anonymity, accessibility, and ease of input.<sup>32</sup> To address these perceived challenges, the SafetyNET team adapted an AE definition based on the patient safety scientific literature and their content team experts to “*any unfavorable sign, symptom, or disease temporally associated with the treatment, whether or not caused by the treatment*”<sup>33</sup>. Regarding the incident reporting mechanism, the SafetyNET team has also developed and validated profession-specific instruments to track and evaluate potential AEs related to SMT in a systematic yet in a time-efficient manner.<sup>34</sup> Provider feedback from a larger study using these instruments (personal communication) suggest that both providers and patients find these instruments easy and quick to use.<sup>34</sup>

We found that providers perceived that ‘potential patient concerns’ were an important barrier to participation in a reporting system. Previous studies, however, suggest this concern is not shared by patients.<sup>10,34</sup> Patients who have participated in a SafetyNET’s pilot reporting system stated that they were pleased their provider was participating in a study directly assessing patient safety.<sup>34</sup> Additionally, Huerta and colleagues (2016)<sup>35</sup> observed that not only can patients provide unique input on safety and care, but by reporting events related to safety, they are more engaged in their care.

Regarding direct patient safety items, our study found that respondents scored the item ‘updating a patient’s medication list’ lower than medical offices.<sup>19</sup> Although prescribing medications is typically not within the scope of the SMT providers, seeking information about a patient’s medication list provides healthcare professionals with important information regarding the patient’s current

health status.<sup>36,37</sup> Thus, not only do changes in a patient’s medication list indicate a change in the patient’s health condition<sup>38</sup>, but some medications may pose specific risks for SMT treatment, such as increased risk of bleeding<sup>39</sup>. Therefore, adequate pharmacological training and continued professional development to recognize the importance of asking about patient medication use at every visit could potentially increase patient safety within health care providers’ clinics/offices.

The development and application of the survey described in this study is an important step towards creating a paradigm-shift in SMT providers regarding patient safety research and initiatives. Understanding the opinions and attitudes of SMT providers towards patient safety and identifying potential areas for improvement can lead to specific strategies and interventions to promote a constructive patient safety culture and support the development of effective systems for continuous learning and quality improvement. Although patient safety strategies and initiatives are currently being developed to promote a safety culture and address specific areas, future investigations are needed to assess the feasibility of these strategies’ and their impact on patient outcomes.

## Limitations

### *Survey Development*

Results from the pilot study conducted with the developed Survey to Support Quality Improvement suggest that a limitation of this instrument is its length. A lengthy survey is likely to lower the response rate, especially for items positioned at the end of the survey, and may lead to an increased chance for non-response bias.<sup>40</sup>

### *Survey Application*

Given that the results presented in this study include responses from 276 SMT providers, the results from this study should be interpreted with caution as it only reflects the attitudes and opinions of SMT providers who responded to our survey.

Another limitation of our work is the comparator group. Although Canadian SMT providers’ patient safety attitudes and opinions were investigated in the current study, an American database from medical offices (from AHRQ) was used for comparison as a Canadian patient safety database is not available. Therefore, potential cul-

tural differences should also be considered as a potential limitation when interpreting our results.

## Conclusions

This study identified, adapted, and conducted content validation for the SafetyNET's Survey to Support Quality Improvement to measure the patient safety culture of SMT providers, specifically chiropractors and physiotherapists. The survey measures the perceptions of their attitudes and opinions toward patient safety and quality improvement items and is the first study of its kind conducted in Canada. Generally, SMT providers had similar or better patient safety dimension scores compared to the AHRQ 2016 medical offices database. By understanding SMT providers' opinions and attitudes towards patient safety and identifying areas for improvement, organization-specific strategies can be developed to support a culture of patient safety and promote quality improvement.

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