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Original quantitative research

Post-secondary students' adherence to the Canadian 24-Hour Movement Guidelines for Adults: Results from the first deployment of the Canadian Campus Wellbeing Survey (CCWS)

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Abstract

Introduction: New Canadian 24-Hour movement guidelines for adults recommend several hours of light physical activity each day, 150 minutes/week of moderate-to-vigorous physical activity (MVPA) including muscle strengthening activities at least twice a week, no more than 8 hours of sedentary time and 3 hours of recreational screen time each day, and 7 to 9 hours of sleep each night. This study examines post-secondary student adherence to the guidelines and its associations with sociodemographic factors and mental health.

Methods: We analyzed data from a sample of 20 090 post-secondary students in Canada who participated in the 2019–2020 Canadian Campus Wellbeing Survey (CCWS). Prevalence of meeting guidelines for physical activity, sedentary time, recreational screen time and sleep were examined. We conducted logistic regression to examine associations between meeting movement guidelines and sociodemographic factors and mental health outcomes.

Results: Only 9.9% of students (females 10.4%; males 9.2%) were currently achieving four components of the 24-hour movement guidelines. Respondents most commonly adhered to MVPA (61.1%) and sleep (59.7%) guidelines. Adherence to sedentary and screen time guidelines was lower (56.3% and 36.2%, respectively). Sociodemographic factors associated with higher odds of meeting the guidelines included being female, older age, self-identifying as White, and living at high socioeconomic status. Students who reported higher psychological well-being were more likely to meet the guidelines.

Discussion: Overall adherence to the new guidelines is low among post-secondary students in Canada. The CCWS provides a mechanism for monitoring the dissemination and implementation of the new Canadian 24-hour movement guidelines for adults.

Keywords: *physical activity, screen time, sleep, Canadian 24-hour movement guidelines*

Introduction

The Canadian Society for Exercise Physiology released the *Canadian 24-Hour Movement Guidelines for Adults aged 18–64 years and Adults 65 years or older: An Integration of Physical Activity, Sedentary Behaviour, and Sleep* in October 2020.¹ Canada previously

released integrated guidelines for children and youth aged 5 to 17 years in 2016,² and younger children aged 0 to 4 years in 2017.³

These guidelines share an understanding that movement behaviours interact to influence health outcomes and that a mix of movement behaviours across the whole

Highlights

- Approximately 10% of sampled post-secondary students were meeting the new Canadian 24-hour movement guidelines for adults.
- Female and older students were more likely to meet the guidelines.
- Students who reported higher psychological well-being were more likely to meet the guidelines.
- The Canadian Campus Wellbeing Survey (CCWS) provides a mechanism for monitoring implementation of the new guidelines.

day is important for health.⁴ The adult guidelines specify evidence-based recommendations for physical activity, sedentary behaviour (including recreational screen time) and sleep across the whole day. While guidelines for physical activity (i.e. 150 minutes/week of moderate-to-vigorous physical activity [MVPA]) and sleep (7–9 hours per day) are in line with previous guidelines or recommendations, the Canadian 24-hour movement guidelines are the first to recommend specific thresholds for sedentary behaviour (≤ 8 hours per day) including recreational screen time (≤ 3 hours per day; see Table 1).

Over 2 million people, a significant proportion of the young adult population, are attending universities and colleges in Canada.⁵ Students entering college or university are forming their future habits

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TABLE 1
Canadian 24-hour movement guidelines for adults aged 18–64 years

Movement behaviour	Recommendation
Moderate-to-vigorous aerobic physical activity	At least 150 minutes per week (and strengthening activities using major muscle groups at least twice a week)
Light physical activity	Several hours per day
Sedentary behaviour	8 hours or less per day
Recreational screen time	No more than 3 hours per day
Sleep	7 to 9 hours per night

Source: Ross R, Chaput JP, Giangregorio LM, et al.¹

and behaviours; behaviours reinforced or acquired by college/university students may shape their future health and wellness. Accordingly, the post-secondary campus should be considered a critical setting for health promotion for many of the same reasons that schools are.⁶ For example, students could be exposed to sustained health messaging through established knowledge exchange networks. Subsidized facilities, programs and staffing are commonly available to support coordinated intervention work.

The important role of higher education in supporting health promotion is recognized by the 2015 Okanagan Charter: An International Charter for Health Promoting Universities and Colleges. The Charter calls on higher education to embed health into everyday operations, business practices and academic mandates, as well as to lead health promotion action and collaboration.⁷

The majority of adults, including post-secondary students, are not currently meeting the individual components of the Canadian 24-hour movement guidelines. Over 70% are physically inactive and get inadequate sleep,⁸ and over 60% exceed 2 hours of recreational screen time per day.⁹ At the same time, many Canadian post-secondary institutions are reporting mental health crises. Young adults aged 20 to 30 years report the highest rates of mood and anxiety disorders,¹⁰ and one-third of students attending Canadian post-secondary institutions reported experiencing mental health issues (e.g. depression, anxiety¹¹). Engaging in health-promoting behaviours, such as physical activity, and meeting screen and sleep guidelines have been positively linked to mental well-being in adolescents (e.g. Weatherson et al.¹²) and negatively associated with mental illness (e.g. Hu et al.¹³) in adults.

Purpose

A function of guidelines is to underpin monitoring and surveillance of who is

meeting those guidelines. In turn, this may inform the need for, and development of, interventions to target (sub)populations at greater risk of not achieving the guidelines recommended for optimal health.

This study uses cross-sectional self-reported data from the first deployment of the Canadian Campus Wellbeing Survey (CCWS) to characterize post-secondary students' adherence to the 24-hour movement guidelines for adults. The study also examines associations with sociodemographic factors and positive and negative mental health. This investigation is timely given that post-secondary students will be one focus of initial implementation efforts of the guidelines.¹⁴

Methods

Study design

This cross-sectional observational study describes self-report data from the first deployment of the CCWS, in 2019–20. To inform health promotion at the post-secondary level, we need a mechanism to assess the prevalence and correlates of mental health and health behaviours at a local level. In turn, this information may guide intervention prioritization, selection, implementation and ongoing evaluation and program/health service refinement.¹⁵ The CCWS, an online questionnaire, was recently developed as a mechanism for monitoring health and well-being among Canadian post-secondary students. Detailed information about the CCWS study design, methods, survey measures and data access policy is available at <https://www.ccws-becc.ca/>.¹⁵ Additional information about the survey measures, including on validity and reliability, is also available.¹⁶

The CCWS was approved by the Behavioural Research Ethics Board at the University of British Columbia (approval H19-01907) and participating post-secondary institutions.

Study population and recruitment

Participating post-secondary institutions chose their desired student sampling strategy (based on the size of their institution). The majority chose a stratified random sample of their student population. The average proportion (standard deviation [SD]) of enrolled students invited to participate in the sample was 45.51% (25.97%). Of the 20 institutions, 5 chose to survey more than 70% of their student population. Students invited to the survey were sent an information letter via email, with their unique survey link. The students were also sent reminder emails during their survey window, with the number of reminders chosen by the institution. The average length of the survey window across institutions was 23.1 days. The number of reminder emails institutions sent averaged (SD) 2.4 (1.1; range 1–5).

Across the 20 post-secondary institutions, 165 997 students were invited to complete the online survey and 24 760 students responded to the survey (overall response rate = 14.9%). Response rates were markedly higher (22.1%) at institutions that used at least three reminders and incentives. Of the students who responded to the survey, 21 156 students completed the survey (i.e. reached the last page of survey); the remaining 3604 students partially completed the survey.

Data collection

The CCWS is administered online via the University of British Columbia Survey Tool, a cloud database service provisioned by Qualtrics. Two post-secondary institutions participated during Fall 2019 term (November to December) and 18 in the Winter 2020 term (January to April). Of the 20 institutions that participated, 8 were universities, 10 were colleges and 2 were classified as Other. Total student enrolment at these institutions ranged from 1001–5000 students (n = 8) to 10 001–20 000 students (n = 4), 20 001–40 000 students (n = 5) and more than 40 000 students (n = 3).

Outcome measures

Moderate-to-vigorous physical activity

Time spent in moderate and vigorous physical activity (average minutes/week) was derived from the International Physical Activity Questionnaire (IPAQ; see Murphy et al.¹⁷). Before calculating the proportion

of students meeting/not meeting the physical activity guidelines, IPAQ truncation rules were followed for scoring vigorous and moderate physical activity. All moderate and vigorous time variables exceeding 3 hours or 180 minutes per day were capped to be equal to 180 minutes. This rule permits a maximum of 21 hours of activity in a week to be reported for each category (3 hours × 7 days). Students who reported engaging in MVPA for at least 150 minutes/week were classified as having met the MVPA guideline (1 = yes; 0 = no).

The IPAQ has demonstrated moderate correlations and high levels of agreement with accelerometry, and moderate intraclass correlations (0.52; confidence interval [CI]: 0.33–0.66) among university students.¹⁷

Sedentary behaviour

Students were asked to report the number of hours and minutes they usually spent sitting during a full day over the last 7 days. Students who reported less than 8 hours of total sitting time were classified as having met the recommended total sitting time guideline (1 = yes, 0 = no).

Recreational screen time

Students were asked to report the number of hours and minutes spent in recreational screen time on a typical weekday in the past week. Students who reported less than 3 hours of recreational screen time were classified as having met the recommended screen time guideline (1 = yes; 0 = no). The sedentary behaviour questions were derived from the International Sedentary Assessment Tool (ISAT)¹⁸ using modified individual questions from other questionnaires with acceptable reliability across population health surveys.

Sleep

The sleep questions followed evidence-informed recommendations to measure self-reported sleep health of Canadian adults for public health surveillance.¹⁹ Time to sleep and wake up on weekdays and weekends during the past week were assessed using drop-down response options at every half hour. Average total sleep per night was calculated as a weighted average ($[5 \times \text{hours of total sleep on weekdays} + 2 \times \text{hours of total sleep on weekends}] / 7$). Students were classified as having met sleep guidelines if they reported getting 7 to 9 hours of sleep per night (1 = yes; 0 = no). As specific guidelines were not available for outlier

removal/truncation for the sedentary and sleep behaviours, values outside a 6-sigma range (mean \pm 3 SD) were excluded. Values reported as 0 minutes/day were also excluded.

Adherence to the 24-hour movement guidelines

Students meeting all four components (MVPA, total sitting, recreational screen time, sleep) were classified as adhering to the 24-hour movement guidelines (1 = yes; 0 = no).

Sociodemographic variables

Self-report sociodemographic correlates of meeting guidelines included age, ethnicity, gender, parents' education (as proxy for socioeconomic status [SES]), employment status and place of residence. Students reported their age in years, and we created the following age categories: under 20, 20–24, 25–29, 30–34, 35 and over.

Students were asked to select the ethnic category (or categories) that best described their background from a list of categories based on the Canadian census (<https://www12.statcan.gc.ca/census-recensement/index-eng.cfm>). Ethnic categories were collapsed into White; Asian (South Asian, West Asian, Southeast Asian, Chinese, Korean, Japanese, Filipino); Indigenous; and Other/Mixed (Black, Arab, Hispanic, other racial background and multiple ethnicities).

Students were asked to identify gender as woman, man, non-binary or two spirit (if of Indigenous ethnicity). SES was assessed using one survey item that asked about the highest level of formal education of their parent(s)/guardian(s) (high school or less; completed a college program; completed a university degree; completed a graduate or professional degree; I don't know). We compared students who indicated their parents had completed high school or less with those who indicated their parents had completed a college program or above.

Employment status was assessed by asking students the average number of hours of paid work per week they had during the school year (0–40 hours). We compared students employed 1 hour or more per week with those who were not employed.

Place of residence was assessed using one item, and we compared students who lived on or off campus.

Institutions also submitted institution-specific cohort variables that were linked to self-report survey responses: residency status (domestic or international), student type (new or returning) and student status (full- or part-time).

Mental health

Psychological distress

To measure symptomatology of depression and anxiety, the CCWS uses the 10-item Kessler Psychological Distress Scale (K10; e.g. “How often did you feel hopeless?”) to yield a global measure of distress that a person had experienced over that past month.²⁰ Response options range on a 5-point Likert scale from “None of the time” (1) to “All of the time” (5). The response options are summed, with higher scores reflecting greater mental distress. Summed scores are categorized into four groups: little or no mental distress (<20); mild mental distress (20–24); moderate mental distress (25–29); and severe mental distress (30–50).

Well-being

The CCWS assesses emotional, social and psychological well-being over the last 2 weeks using the Warwick–Edinburgh Mental Well-being Scale (WEMWBS).²¹ The WEMWBS consists of 14-items that are all positively worded and relate to the main components (eudaimonic and hedonic) of mental well-being (e.g. “I've been feeling optimistic about the future”). Response options range on a 5-point Likert scale from “None of the time” (1) to “All of the time” (5). The items are summed to provide a single score from 14 to 70, with higher scores reflecting greater well-being. Summed scores were categorized into three groups: low mental well-being (≤ 40); average mental well-being (41–58); and high mental well-being (59–70).

Statistical analysis

We used descriptive statistics to characterize the study sample, mental health and prevalence of meeting the 24-hour movement guidelines. We used logistic regression models to estimate odds ratios (ORs) and 95% CIs for the associations between sociodemographic and mental health factors and participants' compliance with the 24-hour movement guidelines. Mean percentage (SD) meeting guidelines across the post-secondary institutions was 10.62% (2.70%). Likelihood ratio test indicated that the logistic regression model achieved significantly better fit when adjusted for

student clustering within post-secondary institutions. Statistical significance was set at $p < 0.05$. We completed all statistical analyses using the survey procedures in statistical package R version 3.6.3 (Vienna, AT).

Results

Participants

Of the 24 760 students who participated in the survey, we excluded 3575 students who did not provide responses to all four individuals components of the Guidelines (3144 MVPA, 3021 sitting time, 2996 screen time, 2586 sleep), unless the student self-reported not meeting at least one of the components they did respond to (3773 students). We also excluded 1095 students who had not reported their age or reported their age outside the range of 18 to 64 years. The final analytical sample was 20 090 participants.

Student demographics

The mean (SD) age of the total sample was 24.1 (7.1) years, and 67.0% identified as women. Almost half of the students identified as having Asian ethnicity (45.5%) and 34.3% as White. Two-thirds self-reported being employed (62.5%) and most as living off campus (90.1%). Three-quarters (76.8%) were classified as coming from high SES households. Institutional data indicated that the majority of respondents were domestic (75.9%), returning (71.1%) and full-time (79.1%) students.

Average (SD) MVPA was 283.6 (260.7) minutes/week. Students reported accumulating a daily average (SD) of 4.7 (2.7) hours of recreational screen time; 8.0 (3.4) hours of total sitting time; and 7.9 (1.4) hours of sleep. The mean well-being score (SD) was 45.1 (10.1) out of 70, with 60.2% of students categorized as having average mental well-being (WEMWBS score: 41–58). The average psychological distress score (SD) was 25.5 (8.3) out of 50. While just over 25% of students were categorized as having little or no mental distress, 21.6%, 20.6% and 31.2% of students were classified as having mild, moderate and severe mental distress, respectively. The demographic characteristics of the study sample are shown in Table 2.

Adherence to the 24-hour movement guidelines

Overall, 9.9% of students met all four components of the 24-hour movement

TABLE 2
Participant demographics by total sample (N = 20 090)

Characteristic	Number and proportion of sample total (%) or standard deviation (SD)
Gender	
Women	13 166 (67.0%)
Men	6230 (31.7%)
Non binary	243 (1.2%)
Two spirit	16 (0.1%)
Mean age in years	24.1 (SD: 7.1)
Age group (years)	
18–19	4601 (22.9%)
20–24	9311 (46.3%)
25–29	3132 (15.6%)
30–34	1340 (6.7%)
≥35	1706 (8.5%)
Ethnicity	
White	6839 (34.3%)
Asian	9053 (45.5%)
Indigenous	363 (1.8%)
Other/Mixed	3659 (18.4%)
Parent/guardian education (SES)	
Low	4293 (23.2%)
High	14 216 (76.8%)
Employment status	
Employed	11 896 (62.5%)
Unemployed	7142 (37.5%)
Place of residence	
On campus	1843 (9.4%)
Off campus	17 751 (90.1%)
No stable housing	106 (0.5%)
Residency status	
Domestic	15 244 (75.9%)
International	4846 (24.1%)
Student type	
New	3829 (28.9%)
Returning	9443 (71.1%)
Student status	
Full time	15 533 (79.1%)
Part time	4112 (20.9%)
Movement behaviours	
MVPA, minutes/week	283.6 (SD: 260.7)
Recreational screen time, hours/day	4.7 (SD: 2.7)
Total sitting time, hours/day	8.0 (SD: 3.4)
Sleep, hours/day	7.9 (SD: 1.4)

Continued on the following page

TABLE 2 (continued)
Participant demographics by total sample (N = 20 090)

Characteristic	Number and proportion of sample total (%) or standard deviation (SD)
Mental well-being, mean WEMWBS score^a	45.1 (SD: 10.1)
Low (WEMWBS score: ≤40)	6162 (31.4%)
Average mental well-being (WEMWBS score: 41–58)	11 809 (60.2%)
High mental well-being (WEMWBS score: 59–70)	1649 (8.4%)
Mental illness, mean K10 score^b	25.5 (SD: 8.3)
Little or no mental distress (K10 score: <20)	5262 (26.6%)
Mild mental distress (K10 score: 20–24)	4286 (21.6%)
Moderate mental distress (K10 score: 25–29)	4086 (20.6%)
Severe mental distress (K10 score: 30–50)	6171 (31.2%)

Abbreviations: K10, Kessler Psychological Distress Scale; MVPA, moderate-to-vigorous physical activity; SD, standard deviation; SES, socioeconomic status; WEMWBS, Warwick–Edinburgh Mental Well-being Scale.

Note: Totals do not always add up due to missing data (“I prefer not to answer,” “Not applicable,” or “I don’t know”).

^a Assessed over the last 2 weeks using the WEMWBS.²¹ Response options range on a 5-point Likert scale from “None of the time” (1) to “All of the time” (5). The items are summed to provide a single score from 14 to 70, with higher scores reflecting greater well-being.

^b Based on responses to the 10-item Kessler Psychological Distress Scale.²⁰ Response options range on a 5-point Likert scale from “None of the time” (1) to “All of the time” (5). The response options are summed, with higher scores reflecting greater mental distress.

guidelines (see Table 3). Of the four components, meeting the MVPA guideline was the most prevalent (61.1%), followed by sleep (59.7%), sitting time (56.3%) and recreational screen time (36.2%). Overall adherence (9.9%) does not change when recreational screen time and total sitting time was considered as a sedentary behaviour variable (< 8 hours sitting and < 3 hours screen time per day).

Correlates of guideline adherence

In terms of the sociodemographic correlates, male students had lower odds of meeting the overall guidelines than female students (see Table 4). White students had the highest odds of meeting the guidelines, followed by Other/Mixed, Indigenous and Asian ethnicity groups. Respondents aged 35+, 30–34, 25–29 and 20–24 years

had significantly higher odds of meeting the overall guidelines than those less than 20 years old. Similarly, those classified as having a higher SES were more likely to meet the guidelines than those at low SES. Returning students had lower odds of meeting the guidelines than new students.

In terms of mental health, those classified with high mental well-being and average mental well-being had, respectively, 90% and 52% higher odds of meeting the overall guidelines than those with low mental well-being. Students classified as having severe mental distress had the lowest odds of meeting the guidelines (see Table 4).

Discussion

This study presents the first data on post-secondary students’ adherence to the new

Canadian 24-hour movement guidelines for adults and identified sociodemographic and mental health correlates of guideline compliance. Adherence to the overall guideline was low, with approximately 10% of the sample meeting the guideline. Notably, institutions did not vary much by student adherence to the guidelines. Further studies could explore the institutional-level factors that may explain the modest variation (e.g. urban versus rural settings; large versus small institutions).

The transition in Canada from physical activity guidelines to new guidelines that incorporate the spectrum of movement behaviours has changed the profile of who are now meeting those guidelines. Older students were more likely to meet the new guidelines than younger students, and women were more likely than men to meet the guidelines. The earlier Canadian physical activity guidelines were more likely to be met by younger adults and men.²² This change likely reflects different age and gender patterns in screen time usage. An analysis of cross-sectional Canadian surveys found minimal sex/gender-based differences in accelerometer-measured sedentary time, but the types of sedentary activities respondents self-reported differed.²³ Men generally reported higher leisure screen time, including time spent playing video games, while women were more likely to spend sedentary leisure time reading.²³

The prevalence of different types of sedentary activities changes with age. Leisure screen time has increased for all ages, but continues to be highest for youth and decreases with age.²⁴ More young adults (aged 20–24 years) reported spending time using a computer and playing video games, but prevalence decreased with age as reading and watching TV became more common.⁹ These differences in type of sedentary behaviour, particularly recreational screen time, may explain why older students and women were more likely to meet the integrated guideline in this study.

In terms of individual movement behaviours, the majority of students self-reported meeting physical activity (61.1%) and sleep (59.7%) guidelines. This is comparable to national data, where nearly two-thirds of Canadian adults aged 18–34 years self-reported meeting physical activity guidelines in 2018.²⁵ (Of note, only 16% Canadian

TABLE 3
Adherence to the 24-hour movement guidelines

Guideline component	Proportion of participants adhering to the guideline (%)		
	Overall	Females	Males
All four components	9.9	10.4	9.2
Sleep	59.7	59.1	61.7
MVPA	61.1	59.6	64.4
Recreational screen time	36.2	37.7	33.2
Total sitting time	56.3	57.1	54.6
Sedentary behaviour ^a	22.1	23.1	20.0

Abbreviation: MVPA, moderate-to-vigorous physical activity.

^a Sedentary behaviour: <8 hours sitting/day and <3 hours screen time/day.

TABLE 4
Prevalence of meeting the overall guidelines and associations with sociodemographic variables and mental health

Sociodemographic variable	Prevalence (%)	95% CI	Adjusted OR ^a	95% CI	p-value
Gender					
Women	10.4	(9.8–10.9)	Ref.	–	–
Men	9.2	(8.5–9.9)	0.84	(0.73–0.96)	0.011*
Non binary	9.1	(6.1–13.3)	1.14	(0.68–1.89)	0.626
Two spirit	18.8	(6.6–43.0)	2.49	(0.52–11.98)	0.256
Age, years					
18–19	8.0	(7.2–8.8)	Ref.	–	–
20–24	9.0	(8.4–9.6)	1.31	(1.10–1.57)	0.003**
25–29	11.8	(10.7–13.0)	1.59	(1.29–1.95)	<0.001***
30–34	11.9	(10.3–13.8)	1.57	(1.21–2.04)	0.001***
≥ 35	15.5	(13.8–17.3)	1.71	(1.35–2.16)	<0.001***
Ethnicity					
White	13.9	(13.1–14.7)	Ref.	–	–
Asian	7.6	(7.1–8.1)	0.55	(0.47–0.64)	<0.001***
Indigenous	8.5	(6.1–11.9)	0.65	(0.41–1.03)	0.066
Other/Mixed	8.9	(8.1–9.9)	0.67	(0.56–0.80)	<0.001***
Parent/guardian education (SES)					
Low	8.9	(8.1–9.8)	Ref.	–	–
High	10.6	(10.1–11.1)	1.18	(1.01–1.37)	0.032*
Employment status					
Employed	10.6	(10.1–11.2)	Ref.	–	–
Unemployed	9.1	(8.4–9.8)	0.89	(0.77–1.02)	0.086
Place of residence					
On campus	10.0	(8.7–11.5)	Ref.	–	–
Off campus	10.0	(9.6–10.4)	1.08	(0.86–1.36)	0.501
No stable housing	7.5	(3.9–14.2)	1.19	(0.49–2.92)	0.697
Residency status					
Domestic	10.4	(9.9–10.9)	Ref.	–	–
International	8.5	(7.7–9.3)	0.89	(0.75–1.06)	0.188
Student type					
New	11.2	(10.3–12.3)	Ref.	–	–
Returning	10.6	(10.0–11.2)	0.79	(0.68–0.91)	0.001**
Student status					
Full time	9.6	(9.2–10.1)	Ref.	–	–
Part time	11.0	(10.0–12.0)	1.04	(0.89–1.21)	0.618
Mental health variable: well-being					
Low mental well-being (WEMWBS score: ≤40)	6.5	(5.9–7.2)	Ref.	–	–
Average mental well-being (WEMWBS score: 41–58)	11.2	(10.6–11.8)	1.52	(1.27–1.82)	<0.001***
High mental well-being (WEMWBS score: 59–70)	14.2	(12.6–16.0)	1.90	(1.46–2.48)	<0.001***
Mental health variable: mental illness					
Little or no mental distress (K10 score: <20)	14.3	(13.4–15.3)	Ref.	–	–
Mild mental distress (K10 score: 20–24)	10.2	(9.3–11.1)	0.78	(0.66–0.91)	0.002**
Moderate mental distress (K10 score: 25–29)	9.1	(8.3–10.0)	0.72	(0.60–0.87)	<0.001***
Severe mental distress (K10 score: 30–50)	6.6	(6.0–7.3)	0.54	(0.44–0.66)	<0.001***

Abbreviations: CI, confidence interval; K10, Kessler Psychological Distress Scale; OR, odds ratio; Ref., reference group; SES, socioeconomic status; WEMWBS, Warwick–Edinburgh Mental Well-being Scale.

^a Odds ratio adjusted for all other variables in the table and institutional-level clustering.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

adults were meeting the recommendations in 2017 when physical activity was measured using devices versus self-report.²⁶ Two-thirds (65%) of adults aged 18–79 years met sleep duration recommendations, with the average adult sleeping 7.2 hours per night.²⁷ Canadian adults aged 18–79 years are sedentary 9.6 hours per day, so sedentary behaviour in the current sample is perhaps lower than expected.²⁸ It is important to acknowledge that the CCWS uses a measure of sitting time to estimate sedentary behaviour. This measure may not capture time spent lying down, for example.

Our findings also reinforce the consistent association between mental health and guideline adherence.²⁹ Given the cross-sectional nature of the CCWS data, it is just as likely that positive mental health is an antecedent of participation in physical activity and lower sedentary behaviour as it is a consequence of those behaviours. The findings do reinforce the need to consider the role of movement behaviours in the context of mental health initiatives in the post-secondary setting (see the Canadian Standards Association³⁰).

The CCWS data provide a snapshot of how many post-secondary students are meeting the new 24-hour movement guidelines. The data also provide a benchmark for monitoring movement behaviours over time. As implementation of the guidelines is being considered in this population,¹⁴ the results suggest that sedentary behaviour, and screen time in particular, would be a target if the goal was to increase adherence to the overall guidelines. Whether such a target makes sense from a health perspective is less clear given compositional analyses demonstrating that reallocating time into MVPA from other movement behaviours was associated with favourable changes to most health outcomes.³¹ This systematic review by Janssen et al.³¹ examined if the composition of time spent in movement behaviours (i.e. sleep, sedentary behaviour, light physical activity and MVPA) was associated with health in adults. Results suggested that time reallocations would always favour reallocating time into MVPA and reallocating time out of sedentary behaviour.³¹ Messaging about replacing sedentary time (including recreational screen time) with any physical activity is warranted. Such messaging and intervention planning may need to be sex/gender-sensitized and culturally appropriate to international students and others who identify as having a minority group

status based on culture, race, sexual orientation and/or other identities.

Interpreting the data requires caution given the self-report nature of the CCWS and the final response rate. The majority of students completed the CCWS before COVID-19-related restrictions were put in place in March 2020. The onset of the pandemic and related restrictions may nevertheless have dampened the response rate at several institutions. Overall, the sample of respondents was a good representation of the cohort of students invited to complete the survey (see Faulkner et al.³²).

Finally, indicators assessed by the CCWS were generally in line with findings from comparable national datasets including the National College Health Assessment (NCHA) at 58 Canadian post-secondary institutions in 2019³¹ and the 2018 Canadian Post-secondary Education Alcohol and Drug Use Survey pilot (CPADS).^{33,34} Our findings of greater response rate with at least three reminders and the use of incentives have important implications for future deployment of the CCWS. The CCWS does not include measures of strength training or light physical activity so does not assess all components of the new movement guidelines.

The CCWS will serve as a platform for future deployment and for tracking the health and well-being of post-secondary students over time. Given that the post-secondary population is a target of planned guideline implementation efforts,¹⁴ the CCWS will be a mechanism for monitoring the dissemination and implementation of the new Canadian 24-hour movement guidelines for adults. Future research will examine how the CCWS data are used by institutions and how they inform policy, programming and practice initiatives to do with movement behaviours. In time, this may allow for identifying better practices in health promotion at the post-secondary level in Canada.

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Conflicts of interest

The authors have no conflicts of interest to declare.

Authors' contributions and statement

KAW: project administration; methodology; writing – original draft

HJ: data curation; formal analysis; writing-original draft

KW: project administration; writing-original draft

MYWK: methodology; writing – review and editing

JRT: writing – review and editing

GF: conceptualization; methodology; funding acquisition; supervision; writing – review and editing

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Original qualitative research

Barriers and facilitators encountered by family physicians prescribing opioids for chronic non-cancer pain: a qualitative study

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Abstract

Introduction: Harms caused by prescription opioid analgesics (POAs) have been identified as a major international public health concern. Recent statistics show rising numbers of opioid-related deaths across Canada. However, Canadian family physicians appear to have inadequate resources to safely and effectively prescribe opioid analgesics to treat chronic non-cancer pain (CNCP).

Methods: We completed a qualitative study of the barriers and facilitators to safe and effective prescribing of opioid analgesics for CNCP through semi-structured interviews with eight family physicians in Nova Scotia. Thematic analysis was used to identify the barriers and facilitators.

Results: Family physicians identified challenges in prescribing opioid analgesics for CNCP: the complexity of CNCP management, addictions risks and prescribing tools, physician training, the physician–patient relationship, prescription monitoring and control, and systemic factors.

Conclusion: Family physicians described themselves as inadequately supported in their prescribing of opioid analgesics for CNCP and could benefit from an integrated and coordinated approach to prescriber support.

Keywords: *opioid, family physicians, chronic pain, addiction*

Introduction

There were 16 364 opioid-related deaths in Canada between January 2016 and March 2020.¹ Nova Scotia had an estimated 57 confirmed and probable acute opioid toxicity deaths in 2019 and recorded 45 opioid overdose deaths in 2020.²

In 2018, nearly 1 in 8 Canadians were prescribed opioids.³ In 2010, about 86% of Canadian family physicians used prescription opioid analgesics (POAs) to treat chronic non-cancer pain (CNCP) in at least some patients.⁴ A more recent survey,

conducted from May 2018 to October 2019, found that 89% of family physicians prescribed opioid analgesics to treat CNCP.⁵

A 2015 systematic review of 14 studies on physician adherence to prescribing guidelines for CNCP in Australia, Canada, France and the USA found that a significant proportion of physicians were not following guidelines largely because of a lack of awareness of their existence; because the guidelines were difficult to implement into practice; and because physicians were inadequately educated in pain management with POAs.⁶ The most current widely-adopted Canadian guideline for

Highlights

- There is a complex intersection of challenges in prescribing opioid analgesics for chronic non-cancer pain (CNCP): the complexity of chronic pain management, addictions risks, physician training, the physician–patient relationship, prescription monitoring and control, and systemic factors.
- Family physicians and patients need timely access to experts in pain management.
- A comprehensive integrated system of support for CNCP management that provides peer-to-peer communications tools and access to a team of pain specialists is needed to support family physicians and patients.

prescribing opioid analgesics for CNCP was released in 2017 by the McMaster University National Pain Centre.⁷ A 2020 survey-based study of this guideline's impact on Canadian physicians suggested that there was a high degree of awareness of the guideline among respondents and some evidence that physicians' practice had changed to better align with evidence for CNCP management.⁸

Data from Ontario from 2014–2015 indicate that the majority of opioid analgesic prescriptions were made by family physicians (38.4%), followed by dentists (16.7%).⁹ Family physicians' role in prescribing a large proportion of opioids makes the

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details of their CNCP management practices useful for determining how to tailor policies and supports to make opioid prescribing for CNCP as safe and effective as possible in the context of continued POA-related harms. Qualitative studies internationally¹⁰⁻¹³ and in Ontario^{14,15} have identified key barriers and facilitators to safe and effective prescribing of opioid analgesics for CNCP by primary care physicians. These studies documented a great deal of complexity in the unique relationships between CNCP patients and their providers. They found that primary care physicians were challenged by the management of the time-consuming complexities of CNCP in the often tightly-scheduled milieu of outpatient primary care practices.¹²⁻¹⁴ A qualitative study found that through participation in video-conferenced workshops that involved structured discussion with peers and with interprofessional experts, rurally practising family physicians in Ontario gained greater confidence in prescribing opioid analgesics and developed better relationships with their CNCP patients.¹⁶

Knowledge of Canadian family physicians' experiences in prescribing opioid analgesics for CNCP is growing due to recent research in this ever-evolving area. But no in-depth qualitative studies on prescribing for CNCP have been completed in Atlantic Canada.

A more detailed understanding of barriers and facilitators to family physicians' safe prescribing of opioid analgesics could inform public health strategies that support effective prescribing while minimizing potential harms. Such qualitative research could also help map areas for further in-depth study.

Methods

Approval for the study was obtained from the Dalhousie University Research Ethics Board.

We conducted semi-structured interviews with practising family physicians recruited using a snowball sampling technique (i.e. a participant was purposively selected, the initial participant suggested other contacts as potential participants, and these suggested others, and so on). The interviewer (JG) used a pre-scripted guide (available on request from the authors). The interviews were audio recorded and transcribed.

Discussion topics included

- what participants considered to be the core issues and challenges with respect to prescribing opioid analgesics; and
- what kinds of supports are, or would be, helpful to enable safe and effective prescribing of opioid analgesics.

Transcripts were analyzed (by JG) in the order that they were recorded using a thematic analysis approach, with Atlas.ti software version 1.5.4.¹⁷ The author began coding the interview transcripts with a framework that identified codes (with multiple corresponding quotations) as either a barrier or a facilitator to safe and effective prescribing of opioids for CNCP. A code manual was maintained to explicitly define each code, and notes were made each time a code was changed. The codes were reviewed by SK to confirm their validity. A reflexive journal was kept during analysis to maintain transparency about coder influences on the research findings. Key quotations were annotated with memos to track emergence of possible themes. Codes were sorted in Atlas.ti under theme descriptions that emerged from the codes, and the themes were consciously searched for contradictions.

We continued to conduct interviews until the data reached saturation at eight participants; at this point, no further participants were recruited for interviews. Saturation was defined by consensus between the two authors through discussion of the codes and themes when no significant new themes had emerged from the three most recently transcribed and analyzed interview transcripts.

The interviews took place from August 2016 to June 2017.

Results

Interview participants had a range of practice focuses (see Table 1 for an overview). However, interview questions concentrated on participants' experiences in outpatient family medicine clinic settings.

A total of 67 codes were developed and used during analysis to organize the data into unified themes. A set of six key themes emerged from the interview transcript text: (1) the complexity of CNCP management; (2) addictions risks and prescribing tools; (3) physician training; (4) the physician-patient relationship; (5) prescription monitoring and control; and (6) systemic factors.

(1) Complexity of CNCP management

The barriers posed by the inherent complexity of CNCP management were evident in our interviews. The family physicians often commented on their difficulty in managing patients with complaints of non-specific pain or poorly understood disorders such as fibromyalgia.

The problem is [opioids are] just not the best answer for that problem. We don't have a good answer for chronic pain. It's probably going to be more psychological counselling. People have very similar impairments and injuries and very different responses to them as far as pain goes. – Physician 7

One participant noted that the subjectivity of patients' level of pain is a unique aspect of treating pain that makes it more difficult to treat than problems with visible or quantifiable findings.

TABLE 1
Interview parameters and participant demographics (N=8)

Interview dates	August 2016–June 2017
Length of interview	35 minutes–1 hour 35 minutes
Practice locations	Halifax, Nova Scotia (n=6) Rural Nova Scotia communities (n=2)
Sex	3 women, 5 men
Practice experience	1–38 years
Practice focus	General family medicine, walk-in clinics, locums, addictions, mental health, geriatrics, First Nations
Practice size	500–1000 patients
Proportion of practice patients presenting with pain severe enough for treatment with POAs	1–10% (family physicians' estimates)

Abbreviation: POA, prescription opioid analgesics.

And people's experiences are really subjective too...for a lot of people, we don't necessarily have a good solid physiologic cause of their pain.
– Physician 5

The participants commented on the high comorbidity between CNCP and mental health problems. They also mentioned that, in a typical family practice, time is often a constraint to thorough CNCP management.

In the community, [a family physician] might have a 5- or a 7- or 10- or 15-minute [appointment], and they totally have inadequate time to cover it. So, it can come up where you run out of time. – Physician 6

(2) Addictions risks and prescribing tools

The participants frequently commented that a history of addiction can limit treatment options for pain because of concern that prescribing opioid analgesics could lead to unsafe use by the patient. Several also recounted experiences with “inheriting” patients who had already been prescribed opioid analgesics for CNCP at doses the physicians considered inappropriately high, some of whom had possible substance use disorders related to their POA use, and their subsequent difficulty in managing those patients.

...the inheritance thing is tough. People have been on [POAs] for a long time. ‘I’ve been getting this for 20 years, my other doctor’ this and that. And it’s tough to change mindset or for them to consider coming down on it.” – Physician 6

Most participants also noted that they choose to prescribe long-acting POAs to CNCP patients. One participant referenced long-acting POAs’ decreased risk of addiction, and another participant mentioned that such medications have lower street value and are therefore less of a risk for diversion.

The majority of participants indicated that, while tools designed to screen for risk of developing addiction to POAs before initiating treatment may be helpful for some physicians, they do not use them in their practice because of time constraints and their ability to obtain a risk assessment through history taking. One

participant did find a standardized opioid risk assessment tool to be helpful in their practice when used in conjunction with a functional impact scale and pain catastrophizing scale to assess a patient’s potential to benefit from opioid pain control.

All participants with a current family medicine practice used POA treatment agreements. Most of the participants commented that the agreements are useful as a way to decline a request for higher doses or larger volumes of dispensed pills than would be appropriate.

And then I always use the treatment agreements which come in handy. Because when people break the treatment agreement, I can pull it out and [say]: ‘Remember when I said if you take too much, more than I prescribed, and I said if it ran out early then I wouldn’t give you more?’ And they were like: ‘Oh yeah.’ – Physician 3

One participant noted that screening tools do not work equally well for all patient groups when describing their work with First Nations patients.

We have a lot of diabetics so we have a lot of neuropathic pain. We have a lot of people who have old injuries because physical trauma is a big problem...injuries at a rate that I think probably exceeds the average Nova Scotia population...It’s really hard to administer a questionnaire... Not necessarily just from the language...which I’m sure is one barrier for a lot of communities. But it’s also just a really oral tradition based on story telling. A lot of storytelling. And people generally don’t respond very well to a series of questions.
– Physician 5

All of the participants also used random urine drug screening as part of their treatment of CNCP patients with POAs. They found these helpful for monitoring patients’ use of other substances and diversion of POA (indicated by no POA in urine). Such findings would sometimes lead to discontinuation of a patient’s prescription based on their treatment agreement. Two participants commented that, while they had access to rapid urine dip testing in their own clinics, physicians practising without this resource might find sending urine

samples to labs for interpretation a barrier to effectively using that tool.

(3) Physician training

The participants said that typical undergraduate medicine and family medicine training does not focus adequately on treatment of pain. As a result, some sought further training in pain management.

...there had been no instruction whatsoever. I had no didactic training in pain management. Other than what you learn on the street.
– Physician 2

Several participants commented that while some family physicians are following shifts in standards of care for treatment of CNCP, they believe some others still prescribe opioid analgesics too liberally and at too high of doses, following a common 1990s mindset in the medical community that pain was undertreated.

Opioids are overused in general. And the doses are too high many times. – Physician 1

I think the big problem for physicians is this sort of dual message that we keep getting—that physicians are part of the opiate problem and that we’re undertreating pain. And we’re getting both those messages at the same time. Sometimes from the same people. From the public and the media, those are the lines I keep hearing. The opiate problem of overprescribing seems to be the one that’s winning out right now. But it would’ve been the opposite 10 years ago. That physicians were too reluctant to prescribe opiates was the main issue 10 years ago. – Physician 7

All participants were aware of the existence of opioid analgesic prescribing guidelines, with most referring to either the 2010 McMaster University or the 2016 Centers for Disease Control and Prevention (CDC) guidelines to inform their practice. Interestingly, the majority of the participants considered the guidelines most significant as a means of explaining to patients their reason for maintaining their POA dose at a particular level. This was particularly helpful if patients were requesting a dose higher than what the

physician considered appropriate. Participants found that patients were more likely to accept their response if it was supported by evidence from a guideline.

One participant stated that some of the 2016 CDC guideline recommendations, such as the daily dosing limit of 90 morphine milligram equivalents (MME) and the suggestion that patients on psychiatric medications not be prescribed POAs, would mean that some patients' pain was undertreated. Another participant said that the available prescribing guidelines, while appropriate, are often difficult to put into practice in clinical situations for patients with history of opioid addiction.

(4) Physician–patient relationship

Many of the discussions in our interviews focused on the physician–patient relationship and how trust and communication affect prescribing practices. Several participants described having patients they trusted subsequently turning out to be misusing or diverting their prescriptions. Participants noted that these were learning experiences that made them less likely to trust subsequent CNCP patients as readily.

I don't know if trust is the right word because there's a lot of patients that I've gotten burned by that I trusted. If you're only doing urine drug screens [for people] you think are maybe misusing it, or diverting it, then you're going to miss a lot of people. – Physician 3

One participant recounted that when they first began practice, they would have felt guilty about lowering a patient's POA dose, but that now they do so with greater confidence. All participants described being pressured by some patients to prescribe opioid analgesics. Two participants experienced verbal aggression or threats from a patient in such a situation.

I think the patients that I've struggled [with] the most with are the ones that I've acquired on high doses of opioids. Some of them are quite intimidating. They frequently request early dispensing [or] early refills. When you discuss dose reduction, they can become agitated or angry. There's always a reason as to why it's not a good time to wean right now. And it's often, sometimes,

legit. It could be comorbid mental health problems that are flared up, or a distracting injury that doesn't make it a good time to decrease it. Even when you do start to decrease it, there always seems to be something that leads to an increase... Those conversations I think are what scare a lot of physicians. They just terrify me. When I know that I'm going to be doing a urine [test] for someone that I'm quite certain is going to be diverting, I'm very nervous. – Physician 4

But he kept coming for appointments and being aggressive about it. Verbally aggressive and the problem is, he had genuine pain...I tried everything. It was very uncomfortable each visit because he is basically, in an aggressive way, saying, I'm not helping [him] with the pain. – Physician 8

All of the participants described “inheriting” patients on, in their opinion, inappropriately high doses of POAs that were prescribed by a patient's former physician. The participants were then faced with needing to “wean” the patient down to a dose that was within the range suggested by the guideline. Participants said that this was usually poorly received by patients, and participants found it difficult to maintain their relationship with patients in the process of tapering an opioid dose.

(5) Prescription monitoring and control

All participants had experienced difficulties with diversion and misuse of medication by patients.

One patient who is on high doses of hydromorphone every day, and her urine dip is negative for hydromorphone yesterday. So, we have to figure out why that is. And that happens frequently. – Physician 7

Four participants described experiences where they thought patients were searching for a family physician who would provide them with POAs or other medications. This sometimes happened when the patients perceived the participants as new to practice or when they were working as locums.

So, there's a lot of doctor shopping. And people trying to test you out

and see if they could get Dilaudids or whatever from you. I feel like, just like a substitute teacher, you have to be extra strict when you're starting out to kind of set the boundaries and expectations, and then you can kind of ease off with individual patients. – Physician 3

People hear that there's a locum, and opportunists are out there, right? They'll come in and just kind of see what they can get from you. – Physician 5

One participant suggested that the fear of receiving complaints through a regulatory body might serve as a disincentive to lower doses or discontinue prescriptions of opioid analgesics. Four participants mentioned that they find the Nova Scotia Prescription Monitoring Program (NSPMP) helpful. One participant said the NSPMP notified them that two patients might be diverting POAs.

All but one participant discussed the use of dispensing intervals to ensure safe POA use, with shorter intervals allowing the physician to regularly monitor patients face-to-face, and pre-agreed dosing intervals ensuring patients do not consume more than prescribed or divert. One participant described having a patient who takes their daily POA for CNCP under the supervision of a pharmacist to prevent them from misusing. Two participants used POA pill counts with at least some of their CNCP patients to ensure they are taking their dose as prescribed.

(6) Systemic factors

The participants explained that the Nova Scotia Pharmacare formulary rules mandate trialling some non-POA pain medications before others that may be more helpful for a particular patient. Also, the waitlists for provincially funded treatments such as physiotherapy and pain clinic services are prohibitively long, which sometimes leads them to prescribe pain medications while the patient is waiting. Similarly, the participants also stated that waitlists for mental health and addictions services are too long.

Several participants commented that stigma is a major barrier to patients receiving appropriate care.

I've definitely spoken to many colleagues and they're not willing to practice the way I practice because of intimidation. And they're not willing to prescribe methadone for opioid addiction because of fear. And that's too bad. – Physician 4

I think you have the patients that when you want to have a discussion about safety and effectiveness [they say], 'Oh, you think I'm an addict?' ... But that's not why I'm having the discussion with them per se. So, you get a lot of that. And probably they've been treated poorly. – Physician 6

System-level facilitators included ability to prescribe cannabinoids to treat pain, collaborative care clinics, access to pain experts, and support from peers in treating complex CNCP patients. Some family physicians said they felt that colleagues in the community who are isolated from such supports could struggle more with prescribing opioid analgesics as a result.

So at least in a group practice you can get support from [colleagues]. But in the community, there's very little other than talking to their colleagues as well. But they're usually not in the same practice. [My colleague] is in a three-person practice but, yeah, accessing resources for [them] is very difficult. [They are] pretty much on [their] own as far as these patients go. – Physician 7

Some of the participants knew pain expert physicians to contact for support with respect to prescribing opioid analgesics, but they considered it likely that many colleagues did not have such connections. An online pain management forum for physicians was suggested as a potentially effective means of seeking opinions on difficult patient cases. However, another participant felt that such forums are not adequately private and that the embarrassment of asking for help might deter some physicians from using such a forum, but that a phone resource could be an effective alternative.

...a helpline or something like that would be helpful...As long as it's accessible and barrier-free, and physicians aren't going to feel judged because I think lots of physicians are in rough spots with this right

now. And they're scared. That's a little different. So [on a forum] there's that one extra layer of, you're going to have to admit that mess I've gotten myself into. – Physician 4

Discussion

Participants identified intersecting challenges in prescribing opioid analgesics for CNCP. These challenges related to the complexity of CNCP management, addictions risks and prescribing tools, physician training, the physician-patient relationship, prescription monitoring and control, and systemic factors. Discussing the complexities evoked strong emotions in many of the interview participants.

In their 2012 ethnographic American study, Crowley-Matoka and True¹⁸ detailed the emotional challenges for clinicians who were being asked to treat pain effectively while also shouldering the widespread public attention to efforts to avoid “over-prescribing” for pain.

Our findings largely agree with previous qualitative studies of family physicians prescribing opioids for CNCP elsewhere as well as in Canada. In Canada, only two such studies have been conducted, both in Ontario and both by the same research team.^{14,15} Three other Canadian qualitative studies have examined opioid prescribing from the perspective of Ontario pain specialists¹⁹ or with a focus on non-physician providers in long-term care settings.^{20,21}

The findings from non-Canadian studies that corroborated our own included barriers to safe and effective prescribing for CNCP caused by the complexity of chronic pain management, addictions risks inherent to POAs, lack of training in CNCP management, delicate physician-patient relationships and systemic factors such as waitlists.²²⁻²⁴ Desveaux et al.^{14,15} also documented these barriers in their two 2019 Ontario studies.

Key facilitators to safe and effective prescribing that we identified in this study we also saw when reviewing the non-Canadian literature. These included use of prescribing guidelines and access to prescriber tools such as treatment agreements^{10,13} Although Krebs et al.²⁵ found in their 2014 qualitative study that US primary care physicians viewed opioid monitoring as largely incompatible with their

roles, the participants in this study considered the NSPMP to be helpful in their practice. The participants in our study also did not observe, as Krebs et al.²⁵ had, that monitoring of patients' POA treatment with urine screening and treatment agreements could disrupt an effective therapeutic relationship. Participants in both 2019 Ontario qualitative studies mentioned using urine screening, but they suggested that use increased tension in the physician-patient relationship¹⁵ or that urine screening was not useful.¹⁴ Buchman and Ho²⁶ pointed out that despite the paucity of evidence for the use of POA treatment agreements, they are widely used and could undermine the therapeutic relationship between physician and patient.

Our findings are also consistent with those of Latimer et al.,²⁷ who suggested that clinicians can improve their understanding of Mi'kmaq patients' pain by taking the time to listen to the patient's full “story” of the pain, since they might not use descriptors such as adjectives or numeric scales typically used by clinicians to determine their treatment plans. This information could then be used to guide the appropriate diagnosis and treatment.

Most participants described ways that guidelines support their safe and effective prescribing of opioid analgesics. Renthal²⁸ pointed out that the 2016 CDC guidelines,²⁹ pushed the “pendulum” of opioid analgesic prescribing back toward a more restrictive position. The most recent Canadian guidelines were released in 2017 by the McMaster University National Pain Centre to update their previous 2010 guideline; the 10 recommendations cover first-line therapies, POA therapy in substance use disorder, psychiatric disorders, history of substance use disorder, dosing, tapering and POA rotation.⁷

In a 2020 survey of Canadian family physicians, Furlan et al.⁵ found that two of 12 guideline-concordant practices were performed regularly by the majority of respondents. This survey, a follow-up to a similar 2010 survey, found that urine drug screening by respondents had increased from 22% in 2010 to 57% in 2018.⁵ These findings cannot be fully generalized to Nova Scotia, however, because the 2018 survey included only one Nova Scotian respondent.⁵ (Urine drug screening is described under a guidance statement rather than recommendation in the 2017 McMaster

guideline, due to lack of evidence for its use.⁷⁾

While uptake, since 2010, of some guideline-based practices by Canadian family physicians might be attributable to creation and dissemination of prescribing guidelines,⁵ the systemic problems we identified in our study are not easily solved. Our findings suggest that while some family physicians have access to peers and experts to support their prescribing for challenging patient cases, others have to place their patients on long waitlists to obtain those supports because they do not have connections to knowledgeable peers or experts. Prolonged wait times are not confined to Nova Scotia, but have been identified across Canada; wait times for methadone maintenance therapy were between 2 weeks and 12 months across the provinces as of 2011,³⁰ but there is a paucity of more recent published data. A 2017 study of the specialist referral experiences of family physicians in Hamilton, Ontario, found that pain management clinics were among the specialities least likely to respond to requests for consultation.³¹

The majority of family physicians practising in Nova Scotia do so independently in community-based practices, and many are working in rural areas. These family physicians are often isolated from the support of colleagues and experts in pain and addiction medicine that they might need to support their decisions in CNCP management—support that participants in our study often described as being key facilitators to their practice. One participant noted that the Atlantic Mentoring Network for Pain and Addiction, which provides an online forum for discussion of difficult cases with colleagues, was helpful in their practice. A similarly accessible, coordinated and integrated system-wide approach where family physicians are supported with expert knowledge would enable safer and more effective prescribing of opioid analgesics. Such an approach could involve formation of a centralized network of experts in CNCP management that are accessible to all Nova Scotian family physicians when they need a referral for a CNCP patient. This approach could be complemented by simultaneously building capacity for CNCP management through continued medical education sessions with pain experts, similar to the Project ECHO model described by Carlin et al.¹⁶ in Ontario.

Future research

The challenges identified here are likely applicable to other cities in Canada of similar size. Further research is needed to gain a more representative understanding of Nova Scotian family physician practices and whether they follow evidence-based guidelines for prescribing opioid analgesics. It would be useful to gain a better understanding of family physicians' attitudes toward these guidelines on a broader scale and whether there is a need to support their adoption into practice.

More research is also required to effectively address the challenges Nova Scotian family physicians face when prescribing opioid analgesics for CNCP. A survey distributed to all family physicians in the province could accomplish this.

Strengths and limitations

This qualitative study achieved its aim of describing the previously undocumented challenges faced by Nova Scotian family physicians in their prescribing of opioid analgesics for CNCP. Most participants acknowledged that they had an interest in patient populations with addictions or chronic pain. Thus, our participants are not entirely representative of Nova Scotian family physicians. Several of the participants described working in a collaborative care clinic, while most Nova Scotian family physicians work independently in the community.

Despite these limitations, participants did describe experiences of their own and those of colleagues working in independent community practices that would be broadly applicable to the practice of family medicine in NS and beyond.

Conclusion

Nova Scotian family physicians identified intersecting challenges in prescribing opioid analgesics for CNCP related to the complexity of chronic pain management, their relationships with patients, prescription monitoring and control, lack of training, and systemic issues that likely affect family physicians across Canada. Options for Nova Scotian family physicians to manage patients' CNCP are limited. More timely access to experts in pain management and addictions are needed for family physicians and patients in Nova Scotia. A coordinated and integrated system-wide

approach where family physicians are supported would enable safe and effective prescribing of opioid analgesics.

Conflicts of interest

The authors have no conflicts of interest to declare.

Authors' contributions and statement

JG and SK conceptualized the work and both developed the methods for data collection and analysis. JG completed interviews for data collection. Both JG and SK completed the coding and analysis of the data. JG drafted the manuscript and SK provided revisions to the manuscript.

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Commentary

Chronic care specialists should consider in-person visits for victims of intimate-partner violence an essential service

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Clinical activities to do with non-life-threatening disease were deemed nonessential to controlling the COVID-19 outbreak. Nursing and paramedical staff were dispatched to acute care settings, and patient visits in most of the sectors that manage chronic conditions were suspended. Despite the initial difficulties of setting up telecommunications so that I, a physician specializing in headache medicine, could provide health care services remotely, most of my patients were grateful for the option of telehealth; it became a means for them to safely maintain medical contact with me.

However, I also realized this new model of care was not in the best interests of all my patients.

There is widespread concern about the detrimental effects of confinement in vulnerable patient populations that lack social network support groups.¹ In particular, victims of domestic abuse have reported increased risk of violence.² Because I care for patients who are not only predominantly female but also have an innate brain hypersensitivity to aversive stimuli, I am often entrusted with sensitive information about headache triggers, such as emotional distress caused by conjugal violence.³

The COVID-19 pandemic contingency directives did not authorize in-person medical visits for victims of intimate-partner violence (IPV). In-person medical visits have been limited to physical examinations in the case of an acutely fatal condition, such as a thunderclap headache suggestive of an intracranial bleed, or hardware

malfunctions of technology-based therapeutic devices, for example, parenteral drug delivery systems and implantable nerve signalling modulators.^{4,5} Fortunately for these patients, my hospital's institutional authorities were receptive to my request to maintain in-person medical visits, regardless of their headache status. Of course, these patients are screened for COVID-19 infection 24 hours or less prior to the appointment, and safety measures such as hand hygiene, mask wearing and physical distancing are mandatory.

A non-urgent or non-life-threatening service does not equate to a nonessential service. For victims of IPV, accessing health care involves challenges related to cost, fear of facing prejudice and discrimination, the controlling tactics of abusive partners and a low sense of self-efficacy.⁶⁻⁸ Contingency regulations necessary to control the pandemic have further increased vulnerability to IPV, through the crises created by job losses and displacement as well as social isolation caused by mandatory physical distancing.

Despite a predicted rise in IPV incidents, emergency response support services have seen a decrease in the numbers of victims reaching out, likely a consequence of IPV victims' concern at potentially exposing themselves and their loved ones to infection as well as being entrapped with their abuser.⁹

The pandemic has also decreased access to safe havens. Most shelters are operating at reduced capacity, travel is restricted, public transportation has been reduced and curfews imposed.¹⁰ Also, as the majority

of health care centres no longer authorize walk-ins for consultations, victims may be threatened when booking an appointment online or by telephone in the presence of the perpetrator.¹¹ In addition, IPV victims who are from marginalized ethnic communities may have an enhanced sense of mistrust of law enforcement authorities as a result of police officers handing out financial sanctions for breaching confinement; such negative perceptions of the judiciary system often translate to distrust of medical institutions.^{12,13}

Sexual and reproductive health clinical activities are being maintained for victims of domestic abuse in order to screen for collateral damages caused by pandemic-related social isolation.¹⁴ But victims of IPV whose access to their chronic health care provider is restricted may struggle to trust and seek help from unfamiliar health providers. Patients likely want to avoid hurried appointments and professionals' lack of understanding in acute care settings, for example. Also, they may feel guilty about wasting critical services in emergency departments that are at capacity. They may also feel uneasy speaking about sensitive topics in an unfamiliar setting, especially if they are on a hallway stretcher or in a noisy emergency department with limited confidentiality.

Chronic care physicians across all sectors should be encouraged to consider their services essential for patients at risk of violence by current confinement measures. Managing chronic health issues, often over several years, implies long-term follow-up that forges a therapeutic alliance with patients; this makes it more

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likely that patients reach out for help at times of crisis. Such alliances generally reflect the quality of communication between the patient and the health care provider, encompassing a personal relationship and collaborative work.¹⁵

With the patient–physician relationship central to their role, family physicians often build such alliances with their patients through comprehensive coordination of care that extends beyond focus on the disease.^{16,17} The patient–provider alliances that are unrelated to sexual or reproductive health include long-term management of endocrinopathies, autoimmune or inflammatory disorders, chronic kidney disease, and respiratory or cardiac conditions, to name a few.¹⁵ The proposed approach may be valuable in the context of an established relationship with a patient who has disclosed a history of violence and abuse.

With health care reorganized during the pandemic, physicians aware of patients with a history of domestic violence should, as long as logistics permit, arrange at least one in-person visit. Although most physicians are likely to have discussed the topic of seeking help, such discussions are generally superficial and limited to encouraging the patient to seek community resources; many physicians are constrained by heavy workloads and lack the self-confidence to support these patients.⁶ However, repeated interventions by a physician the patient trusts, in a safe environment, is enabling and favourably viewed by patients, while follow-up telephone calls are not.¹⁸

This in-person visit is not meant to screen for IPV—the patient has previously disclosed this information—but to assess their chronic illness and to offer them an opportunity to be put in touch with IPV resources in the midst of an epidemic and psychosocial health crisis. Should the patient need a safety plan, the physician must recognize the limitations of their expertise in IPV and determine if other professionals need to be contacted.

Since the start of the COVID-19 pandemic, many institutions have implemented an on-call social crisis support team for health care workers who need guidance and expertise in assisting their patients. Examples of some practical tips and points to discuss with a victim of IPV during an in-person assessment can include the following:

- For patients who are not tech-savvy or have restricted access to a computer, allocate time during the visit to tell them the locations of the shelters nearest to their home and the hospital as well as other resources such as a cultural community centre. Print out paper copies of the maps for the patient if necessary. Make sure that you give the patient current information about these resources and any pandemic-related operational/organisational changes.
- In planning for the next follow-up, ask the patient when is the best time to call to find her alone to discuss health issues.
- In those institutions where medical notes are still handwritten, make sure that the emergency plan discussed with the patient is electronically typed and legible for all health care professionals should the patient present to an emergency department. This will also reassure the patient that they will not have to provide lengthy explanations during triage, especially if accompanied by the aggressor.
- Tell the patient the exact date and place in the chart where the emergency plan is filed. This can allow them to discreetly and rapidly refer a triage nurse to it.
- Stay up-to-date with a list of cancelled or no-show appointments to ensure that these patients are not removed from the waiting list without your knowledge. Some institutions only permit a certain number of cancellations, failed attempts to reschedule or no-shows before automatically removing them.
- Avoid describing patients as victims of IPV to your clerical staff. Many survivors avoid such a labelling, and as there are many reasons why patients would be seen in person, such as the need for a physical exam if a red flag presents during a telehealth interview (for example, transient vision loss accompanying headache in the field of neurology), there is no need to share the reason for a confidential visit with non-medical staff and personnel not involved in the patient's care plan.

Following this in-person visit, the physician can decide on the frequency of and way to maintain medical contact, but if the patient's reason for contact is related

to domestic abuse, efforts should be made to put the patient in contact with IPV experts who can best make the argument on delivery of care. If the patient and physician prefer to continue care through telehealth, the physician could send the patient a letter with a tentative post-pandemic in-person appointment date. The patient could place this letter in sight, to serve as a reminder to all household members that they are cared for by a health professional who expects to assess their well-being and examine them after the pandemic.

To quote Mechanic and Schlesinger,¹⁹ “the success of medical care depends most importantly on patients' trust that their physicians [...] give their patients' welfare the highest priority.” As it will likely take some time for public health authorities to put in place initiatives aimed at reducing the gendered impacts of the COVID-19 pandemic, we must ensure that our vulnerable patient populations are not neglected.²⁰ Despite the ethical challenges posed by COVID-19 contingency measures balancing public safety and patient-centred care, we must recognize situations where we need to advocate for our patients, especially for those who do not or cannot advocate adequately for themselves. As health care providers, we must share our front-line perspective with public health authorities, such as important factors that might affect the decision about offering in-person visits during the current pandemic. These factors often go beyond the usual practical issues of how much a physical exam might be needed or how easily the patient can access the requisite technology for virtual care.

In this article I highlight the importance of maintaining medical contact, including in-person visits when possible, for victims of IPV who have previously disclosed domestic abuse. This is particularly valuable if we have built a therapeutic alliance with the patient, through long-term management of a chronic health condition, for example. Although the perspective of this article is through the practice of headache medicine, these issues can apply broadly, irrespective of the clinic's specialty, its patients' sex-ratio and its staffing shortage due to COVID-19 redeployment. Physicians in sectors nonessential to the COVID-19 direct response and who have seen a change in their usual clinical activities should consider maintaining their services as essential care for these patients.

As many community social crisis services are seeing drastic increases in wait times, it is important that we remain flexible towards our patients. Moreover, the patient's primary care physician should be involved in the care plan if the patient consents. It is not unusual, however, for a clinician involved in the care of a chronic condition, particularly for complex tertiary level medical illnesses, to have a stronger therapeutic alliance with the patient because of more frequent medical contact.

Finally, as public health authorities aim to improve the reorganization of health care during the global pandemic, physicians are encouraged to collaborate with other institutional specialized teams when limited by their own expertise, in particular with psychosocial staff in assisting marginalized and vulnerable populations. This can be especially useful for victims of IPV, where a well-thought-out safety plan takes into account the complex dynamics of living in an abusive situation that goes beyond the experience of violence.

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At-a-glance

Arthritis liaison: a First Nations community-based patient care facilitator

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Abstract

Introduction: Arthritis is a leading cause of disability in First Nations communities and is often accompanied by other chronic diseases. Existing care models prioritize accessibility to specialty care for treatment, whereas patient-centred approaches support broader health goals.

Methods: A patient care facilitator model of care, termed “arthritis liaison,” was developed with the community to support culturally relevant patient-centred care plans. Following a one-year-long intervention, we report on the feasibility and acceptability of this care model from the perspectives of patients and health care providers.

Results: The arthritis liaison served as a bridge between the clinicians and patients, and fostered continuity, helping patients receive coordinated care within the community.

Keywords: *arthritis, chronic disease, patient navigation, First Nations, Indigenous Health Services, health care outcome and process assessment, qualitative study*

Introduction

First Nations populations have increased prevalence^{1,2}, severity^{3,4} and undertreatment of arthritis⁵. Inequities in determinants of health related to the legacy of colonization⁶ affect health status⁷. Health care providers either consciously (through disregard for cultural values) or unconsciously (by failing to provide culturally relevant care) disempower patients⁸. This can affect the continuity of care and undermine efforts to support effective disease management and wellbeing⁹.

Novel ways of delivering relevant care that addresses social, geographical and economic barriers are needed to improve outcomes among First Nations people with arthritis¹⁰. In keeping with principles of

community empowerment and self-determination, we should prioritize Indigenous-led initiatives¹¹ and those that support Indigenous providers in the workforce¹².

Case management models of care, and the closely related patient navigation care models, are effective approaches in chronic disease management¹³⁻¹⁶, but the benefits of the models in terms of arthritis management vary¹⁷⁻¹⁹. In addition, the models have neither been implemented nor evaluated in the context of care of Indigenous patients with arthritis. While these models aim to counter the focus of specialist care on single disease entities and could support the use of cultural practices, we propose that they may be a way to deliver arthritis care in Indigenous communities.

Highlights

- Care models that address health in a culturally relevant manner and also address the many barriers to care may resolve care gaps more effectively and optimize health outcomes of First Nations people with arthritis and comorbidities.
- The arthritis liaison model of care was built on case management functions informed by Indigenous community members to ensure care facilitation was included in the model.
- The scope ranged from medical aspects to personal support, and was consistent with a culturally appropriate patient-centred approach dictated by patients' needs.

In this report, we describe the development, implementation and accessibility evaluation of an arthritis liaison model of care in a First Nations community.

Methods

Setting

Siksika Health Services is a self-determined comprehensive primary health care organization. A rheumatology outreach clinic has been offered since 2010. The goal of the clinic is to facilitate access to specialist assessment and treatment in the primary care setting²⁰. The research team compared

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the quality of treatment provided by this clinic to nationally endorsed performance indicators²¹. We also sought service-user perspectives on the gaps remaining in arthritis care²². These perspectives supported the need to further enhance the care model, by providing services that improve physical and mental functions, by improving communication, continuity of care and community education and by increasing peer connections and support²².

Intervention co-development with community

The research team proposed an intervention built on a case management model that focused on needs assessment and the development of treatment and care plans, linking clients to services, monitoring and advocacy²³. We established a research advisory group that included community members and Elders with arthritis conditions, representatives from Siksika Health Services and the former Indigenous patient representative of the Canadian Arthritis Patient Alliance. The principal investigator of the research team is Métis.

In place of “case manager,” the community chose the term “arthritis liaison.” The research advisory group informed duties of the arthritis liaison, patient recruitment strategies and evaluation components of the research. We hired and trained a community member with nursing experience as the arthritis liaison to support arthritis care needs and self-management skills. In addition, the arthritis liaison attended a one-week course in motivational interviewing and action plan facilitation.

Implementation

The arthritis liaison provided medical and personal support for one year. Support included regular communication with participants and their health care team (in person, by telephone or via text messaging). Support for the monthly arthritis specialty clinic was also provided, namely administering prescribed injections and facilitating group-based activities for patients and their families.

Participants

We recruited Siksika Nation patients with inflammatory arthritis or osteoarthritis attending the rheumatology outreach clinic at Siksika Health and Wellness Centre to the intervention. Patients had to be

19 years or older, and in addition to their arthritis condition(s), had to have at least one of the following: diabetes, obesity, hypertension, cardiovascular disease or chronic obstructive pulmonary disease.

Accessibility evaluation and analysis

We documented the number of interactions between the arthritis liaison and participants as well as the reasons for these interactions. We used qualitative methods to explore, from the perspective of each participant and the health care providers in the community, how the arthritis liaison facilitated care. We recorded the semi-structured interviews, and two researchers transcribed and coded them independently using Dedoose software (SocioCultural Research Consultants, LLC, Los Angeles, CA). We compared codes for consistency and interrater reliability. Thematic analysis was conducted and interpreted in relation to principles of patient-centred care and concepts of “culturally safe care for Indigenous peoples in Canada”²⁴. As the arthritis liaison identified as female, interview quotes refer to “she.”

Ethics

This study was approved by Siksika Health Services leadership and by the University of Calgary Conjoint Health Research Ethics Board (REB 15-1961). Roles and responsibilities of the research team to the community were documented in a memorandum of understanding. All participants provided written consent. The research was performed in accordance with ownership, control, access, and possession, or OCAP²⁵ principles of First Nations research, and the 1964 Declaration of Helsinki and its later amendments.

Results

Participants

Between May 2017 and December 2018, 23 patients enrolled in the study. Participants were predominantly female (80%) with a mean age (standard deviation) of 59 (12) years. Rheumatoid arthritis (n = 13) and psoriatic arthritis (n = 5) were the most frequent types of arthritis, and diabetes (n = 9) and hypertension (n = 6) were the most frequent comorbidities. Seventeen participants completed the full intervention period (2 withdrew, 1 died and 3 were lost to follow-up).

Accessibility

The frequency and types of interactions between the arthritis liaison, participants and the health care team are shown in Table 1.

The narratives of the participants (n = 14), health providers (n = 10) and the arthritis liaison showed that the model of care improved accessibility and was accepted and considered to be culturally appropriate.

Participants valued the flexibility in communications and interactions with the arthritis liaison, who adapted to their needs and circumstances. Examples of adaptation included meeting locations for injections and check-ins (e.g. home visits, for coffee); the communication methods used (e.g. text, phone); the extent and frequency of communications; and communication styles (e.g. formal and informal).

Trust in the arthritis liaison, created through respectful, supportive, compassionate and accountable interactions, made it easier for the participants to engage in their treatment. The arthritis liaison engaged

TABLE 1
Snapshots of the arthritis liaison’s interactions in facilitating care

Type of interaction	Mean (SD) number
Face to face	8 (5) hours per participant
Text messages	70 (58) messages to each participant (range: 9–194)
Home visits	112
Health assessments	74
Brief action plans	2–5 goals per participant
The arthritis liaison accompanied the patient to their appointment or communicated with the health care provider to advocate on their behalf	168 appointments total (range: 1–7 per participant; primary care, 8; allied health, 27; home care, 23; medical transportation, 18; investigations, 2; specialist, 90)

with a variety of health care providers in the patient's circle of care to advocate for the patient's interests or for additional resources, including organizing allied health consultations and transportation to appointments, helping access medication and being present during medical appointments.

Finally, through action planning, reminders and facilitation, the arthritis liaison supported engagement in care plans such as accessing resources or achieving set goals.

Following are themes about the accessibility of the arthritis liaison model of care and patient-participants' and providers' quotations to illustrate these themes.

Engaging with patients according to individual needs and preferences

...she's checking up on us, making sure, you know, if we need anything or if anything's come up, you know, she's just a phone call away too.
– Participant 23

She is so easy going, I'm glad that she was open and flexible to my time, 'cause we'll have an appointment to see each other at 2:00, but I'll be doing a workshop somewhere else, and she'll be so understanding.
– Participant 01

She answers immediately—if not immediately, like within 1 hour and better, by texting. – Participant 18

She has been a pretty critical point of contact for patients. From what I am hearing from people is they know how to contact her, and they can kind of get answers and stuff expedited. – Provider 04

An accountable relationship created trust, providing the opportunity to access health information

She's very, like when she says she's gonna do something, she does.[...] If she says, "I'll be there", she's gonna be here. – Participant 17

Even when she wasn't sure of something that I had asked her, she said you know what, I'm gonna find out, I'm gonna ask [name], I'll research it, and I'll get back to you. – Participant 01

Yeah, and I feel comfortable talking to her about my pain and what's hindering me today or whatever. You know, I feel comfortable with that, yeah. I feel, it's all about trust for me, and if I don't trust someone and I feel like they're not really trying to help me, you know, I could, I stand back a little. But when I know someone's helping me in, that's where I can trust them. – Participant 06

If I had any questions about ... Like ... she'd explain when I first started that metho [methotrexate], like if there was something I'd need, she'd explain, like what the medication was for... And she just...would suggest stuff. Like, you know, maybe just sit for a while, before you even try to get up. Like just helpful hints.
– Participant 23

I think a lot of them kind of began to understand what they were going through. They noticed when they'd have, like lower numbers on the EQ5[D; a measure of quality of life]. They could tell when they were in a flare, and they liked to look back at the trends. – Arthritis liaison

Facilitation of communication with health care providers

If the doctor needs information and I can't explain the words properly [the arthritis liaison] can do it for me... – Participant 06

Like the last time I seen Dr. [name], there were some of the things that I forgot that I was gonna ask her and then [the arthritis liaison] was in there, and she just says, "Oh yeah, you were gonna ask her about this." Like I said, she's my memory, right?
– Participant 13

I do believe that it's opened the communication lines, so...people are advocating for themselves more... and are more willing to share, uhm, what goes on in between visits.
– Provider 01

Encouraged utilization of available resources and enabled activation of treatment plans

There was a portion of them who would go on about needing these resources, but when it came down to it and the resources were right there in front of them, they didn't

utilize it... But I think part of it is trust... – Arthritis liaison

I think that that's been a beneficial effect... Again it increases the efficiency of what I need to do because I don't have to wait for a lab value to come back... or have to fill out the requisition again. Like, it's already done. – Provider 02

Threats to feasibility

Although the intervention was generally well-received, we faced some challenges in continually engaging participants in this model of care. Problems arose due to time conflicts, limitations in telecommunications (inaccurate or outdated phone numbers) and personal, family and/or community crises.

The arthritis liaison's availability was limited to working hours, which proved to be a logistical concern as this did not always align with participants' preferred time for interaction. Transportation barriers were also a limitation when the arthritis liaison could not go to patients' homes or patients could not come to the clinic.

We approached the project longitudinally, seeking permanent funding within the operational budget and with a consistent community-based staff member employed in the role so that we could support them and allow them to thrive in their specialized role. Unfortunately, competing priorities for funding arose in the community, and it was not possible to sustain the role after the study funding ended.

Discussion

The arthritis liaison model of care, co-developed with an Indigenous community, assisted Indigenous arthritis patients in navigating the health service to take care of their needs and focus on their personal patient-centred care plans. Both the patients who participated in our study and the community health care providers valued this model of care. One participant's narrative illustrates the overall perception of the arthritis liaison model, noting that they were "not a miracle worker to make my arthritis go away, [but] she's there to help you with the medical part and the moral support."

Health system navigation is complex in chronic disease management. Here, the

arthritis liaison served as a bridge between the health care providers and patients, and fostered continuity. A metasummary of qualitative studies of patient experience of care continuity concluded that a single trusted clinician that partners for decision making and system navigation is at the core of what people perceive as adequate continuity of care²⁶. Patient support, education, case management and system navigation delivered by trained personnel who are trusted community-based members are effective approaches in chronic disease management, especially in underserved, vulnerable communities²⁷. In this study, our model of care appears to have enabled patients to receive coordinated, continuous care within the community by virtue of the work of the arthritis liaison.

In this real-world study, not all patients wished to complete evaluations, and we are only able to report the perspectives and outcomes of patients fully engaged in the model of care.

Our findings are likely relevant to many diverse Indigenous peoples and communities in Canada.

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Conflict of interest

The authors declare that they have no conflict of interest.

Authors' contributions and statement

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ALS: Conceptualization, analysis, funding acquisition, investigation, methodology, project administration, supervision, writing original draft and review and editing

VBC: Investigation, resources, writing review and editing

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LoC: Conceptualization, funding acquisition, supervision, writing review and editing

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