Mental health and the relationship between health promotion counseling and health outcomes in chronic conditions

Cross-sectional population-based study

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Abstract

Objective To explore the relationship between health promotion counseling (HPC) provided by FPs and health-related quality of life (HRQL) and the use of health care services among patients with chronic conditions, while assessing the effect of mental health on these relationships.

Design Telephone survey using random-digit dialing.

Setting Alberta.

Participants A total of 1615 participants with chronic conditions.

Main outcome measures Health promotion counseling provided by FPs, which was assessed using 4 questions; HRQL using the Euro quality of life 5-dimensions (EQ-5D) questionnaire; and the use of health care services assessed with self-reported emergency department (ED) visits and hospitalizations.

Results Of the 1615 participants with chronic conditions, 55% were female and more than two-thirds were older than age 45 years. Less than two-thirds of participants received HPC from their FPs. In patients without anxiety or depression, those who needed help from their FPs in making changes to prevent illness had a 0.05 lower EQ-5D score than those who did not ($P<.001$); and those who received diet counseling had a 0.03 higher EQ-5D score than their counterparts did ($P=.048$). However, these associations were not observed in patients with anxiety or depression. Patients were more likely to have visited EDs if they needed their physicians' help in making changes to prevent illness (odds ratio 1.43, 95% CI 1.08 to 1.89) and less likely to visit EDs if they had been encouraged by their physicians to talk about their health concerns (odds ratio 0.69, 95% CI 0.52 to 0.91). None of the HPC items was associated with hospitalizations.

Conclusion Not all patients with chronic conditions are receiving HPC from their FPs. Also, there is an association between HPC and important health outcomes (ie, HRQL and ED visits), but this association is not apparent for those with anxiety or depression.

EDITOR'S KEY POINTS

• Little is known about the effects of health promotion counseling (HPC) on health-related quality of life (HRQL) and the use of health care services. The effect of mental health status on the relationship between HPC and these outcomes is also less well understood.

• In this study, only about 50% to 60% of patients with self-reported chronic conditions reported receiving HPC from their FPs.

• This study found a modifying effect of mental health status on the relationship between HPC and HRQL. There was an association between 2 HPC items (ie, diet counseling and needing the help of physicians to make changes) and HRQL in patients who did not report having anxiety or depression; however, this association was not observed in those with anxiety or depression. This implies that patients with anxiety or depression might be less likely to engage in any of the advised HPC activities.

Santé mentale et relation entre le fait de donner aux malades chroniques des conseils pour promouvoir la santé (CPS) et les issues de santé de ces patients

Étude transversale de nature démographique

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Résumé

Objectif Vérifier s'il existe une relation entre le fait pour un médecin de prodiguer des conseils sur la promotion de la santé (CPS) et la qualité de vie liée à la santé (QVLS) et le recours aux services de soins de santé par des patients atteints de maladies chroniques tout en évaluant l'effet de la santé mentale sur ces relations.

Type d'étude Enquête téléphonique par composition aléatoire.

Contexte L'Alberta.

Participants Un total de 1615 malades chroniques.

Principaux paramètres à l'étude Les conseils sur la promotion de la santé prodigués par des médecins de famille, évalués à l'aide de 4 questions; la QVLS, telle qu'évaluée par le questionnaire EQ-5D (Euro quality of life 5-dimension); et l'utilisation des services de santé, telle qu'évaluée par les visites aux départements d'urgence (DU) et les hospitalisations rapportées par les patients.

Résultats Sur les 1615 malades chroniques, 55 % étaient des femmes et plus des deux tiers avaient plus de 45 ans. Moins de deux tiers des participants avaient reçu des CPS de leur médecin. Parmi les patients ne se plaignant pas d'anxiété ou de dépression, ceux qui avaient besoin d'être aidés par leur médecin pour effectuer des changements de type préventif avaient un score EQ-5D de 0,05 point inférieur à ceux qui n'avaient pas besoin du médecin (P<,001); et ceux qui avaient reçu des conseils d'ordre nutritionnel avaient un score EQ-5D de 0,03 point supérieur à ceux qui n'en avaient pas reçu (P=,048). Ces associations n'étaient toutefois pas observées chez les patients souffrant d'anxiété ou de dépression. Les patients qui avaient besoin de leur médecin pour apporter des changements d'ordre préventif étaient plus susceptibles d'avoir visité des DU (rapport de cotes 1,43, IC à 95 % 1,08 à 1,89) et moins susceptibles d'avoir visité des DU s'ils avaient été encouragés par leur médecin à discuter de leurs inquiétudes de santé (rapport de cotes 0,69, IC à 95 % 0,52 à 0,91). Aucun des CPS n'était associé aux hospitalisations.

Conclusion Les malades chroniques ne reçoivent pas tous des CPS de leur médecin de famille. Ajoutons qu'il existe une association entre les CPS et certaines issues de santé importantes (c.-à-d. la QVLS et les visites aux DU); cette association n'est toutefois pas observée chez les patients qui souffrent d'anxiété ou de dépression.

POINTS DE REPÈRE DU RÉDACTEUR

• On connaît mal l'effet qu'ont les conseils de promotion de la santé (CPS) sur la qualité de vie liée à la santé (QVLS) et sur l'utilisation des services de santé. On a également peu d'information sur l'influence de la condition mentale sur la relation entre des CPS et les issues.

• Dans cette étude, à peine 50 % à 60 % des patients déclarant souffrir de maladies chroniques disaient avoir reçu des CPS de leur médecin.

• Dans cette étude, on a observé un effet modulateur de la condition mentale sur la relation entre les CPS et la QVLS. Chez les patients ne se plaignant pas d'anxiété ou de dépression, on observait une association entre la QVLS et 2 types de CPS (les conseils d'ordre nutritionnel et le fait d'avoir besoin d'être aidé par un médecin pour modifier son mode de vie); toutefois, cette association n'était pas présente chez les sujets anxieux ou déprimés. Ces derniers pourraient donc être moins susceptibles d'adopter les comportements suggérés par les CPS.

Attaining healthy behaviour and lifestyle is a core objective in the comprehensive management of patients with chronic conditions, particularly in primary care settings. Primary care has increasingly included healthy lifestyle counseling as a responsibility for all health care providers, including FPs. Family physicians are consulted by 80% of Canadians each year, and it is estimated that patients with chronic disease account for 51% of all visits to FPs.[1] This puts FPs in a unique position to influence patients' behaviour, and makes their involvement and active participation essential to achieving health promotion goals.[2]

Behavioural and healthy lifestyle counseling for patients with chronic conditions generally involves providing education, guidance, and support to develop and maintain healthy behaviour such as healthy eating habits, exercising, weight management, and smoking cessation.[3] The effects of health promotion counseling (HPC) on self-care and health behaviour are well documented[4-6]; however, little is known about its effect on other important outcomes such as health-related quality of life (HRQL) and the use of health care services. Further, the effect of mental health status on the relationship between HPC and these outcomes is less well understood.

Anxiety and depression are the most common mental health conditions among people with chronic disease.[7-10] Independently, both depression and chronic conditions greatly interfere with functioning and adversely affect general health status and HRQL.[11,12] When they occur together, anxiety or depression and chronic conditions might result in particularly poor clinical outcomes as compared with one such condition alone, including increased risk of disability, hospitalization, and early mortality.[13,14] Although the effect of anxiety or depression on the course of chronic conditions is well documented, it is not known whether anxiety and depression interfere with counseling on healthy lifestyle and behavioural practices.

Our objectives were as follows: to determine whether FPs provide HPC to patients with chronic conditions and to identify which patients were most likely to receive this counseling; and to explore the relationship between HPC and HRQL and the use of health care services among these patients and examine whether poor mental health affects this relationship.

METHODS

Data sources

This study used data collected for the Health Quality Council of Alberta (HQCA) Patient Experience Survey 2010. Sampling and data collection were conducted by the Population Research Laboratory at the University of Alberta in Edmonton. Population estimates from the 2009 provincial health care registration database were used to develop the sampling quotas by age and sex for the 9 former health regions in Alberta. These quotas were chosen so that the final sample of persons interviewed would be representative of the age and sex composition of each health region. A random-digit dialing approach was used to ensure that households in each health region had an equal chance to be contacted regardless of whether or not their household was listed in a telephone directory. The sampling frame of telephone numbers was based on landlines and excluded businesses, unlisted cell phone exchanges, and government exchanges. Interviewers conducted the survey using a computer-assisted telephone interviewing system. The target population consisted of people who at the time of the survey were living in Alberta's 9 former health regions and could be contacted by direct telephone dialing. The general rule for participation was random selection of an eligible individual who was 18 years of age or older and resided within a telephoned household. A total of 15 154 individuals were contacted; 5010 completed the interview, 9745 refused to participate, and 399 had language barriers. The overall response rate was 33%.

Measures

We used measures from the HQCA survey questionnaire, which was pilot-tested by the Population Research Laboratory. The survey included 23 sections addressing various aspects of patient experiences with care, one of which was a section on preventive care, including HPC items provided by FPs. Health promotion counseling was assessed using 4 questions:

- Did your doctor talk to you about healthy diet and your eating habits? (HPC1)
- Did your doctor talk to you about exercise and your physical activity? (HPC2)
- Did you need your doctor's help in making changes to prevent illness? (HPC3)
- Did your doctor encourage you to talk about your health concerns? (HPC4)

Each question had a dichotomous response set (ie, yes or no), and the reference period was during the past year. Given that diet and exercise counseling are among the most common HPC topics discussed by physicians, and in the absence of a standardized measure of HPC, we considered these items from the HQCA survey to be an appropriate measure to assess HPC activities.

Health-related quality of life was assessed using the Euro quality of life 5-dimensions (EQ-5D) questionnaire.[15] The EQ-5D is a preference-based health status measure consisting of 5 dimensions (ie, mobility, self-care, usual activities, pain or discomfort, and anxiety or depression), each with 3 functional levels (ie, no problem, some problem, and extreme problem). A preference-based index score, anchored at 0.0 for dead and 1.0 for full health, is

derived by applying an EQ-5D scoring function for that described health state.[15] A difference of 0.03 for the EQ-5D index score is considered to be clinically important.[16] Respondents were also asked if they had been admitted to the emergency department (ED) or hospital at least once during the past year. Additionally, participants were asked whether they had seen other health care professionals (ie, dietitian or nurse) at their FP office at least once during the past year. Having anxiety or depression or other chronic conditions was based on the participant's self-report of whether he or she had been diagnosed by a health professional. Multimorbidity was based on the participant's self-report of having chronic conditions, and was defined as having 2 or more chronic conditions.[17] Sociodemographic data including age, sex, educational level, and income were collected.

Statistical analysis

Descriptive statistics involved reporting frequencies for categorical variables, and mean and SD for continuous variables. To assess differences by anxiety or depression and continuous or categorical variables, χ^2 and t tests were used. We used logistic regression models to explore which patients were most likely to receive each of the HPC items. The relationship between HPC and HRQL was explored using a multiple linear regression model with the EQ-5D index as a dependent variable and the HPC items as primary independent variables, as well as multimorbidity, mental health, and seeing a nurse or dietitian as explanatory variables. The relationship between HPC and the use of health care services was explored using 2 logistic regression models for ED visits and hospitalizations, respectively.

All analyses were adjusted for age, sex, educational level, and income. In each model, we assessed the presence of effect modification by testing for potential interactions, and examined the presence of confounding. Model fit was assessed based on R^2 and residual analysis. All analyses were carried out using STATA for Mac, version 11.1, and a 2-tailed α of .05 was used to assess significance.

RESULTS

Descriptive statistics

A total of 5010 participants responded to the survey. We restricted our analysis to only those participants who reported having a chronic condition (other than depression) (N = 1615).

Sociodemographic characteristics. Among the 1615 participants, 55% were female and more than two-thirds were older than 45 years. Most participants had a postsecondary education (63%), and around half had an annual income of more than $60 000 (**Table 1**).

Comorbidities, use of health care services, and HRQL. More than half of the study sample (54%) reported having 2 or more chronic conditions, and 17% reported having anxiety or depression. With respect to the use of health care services, 34% of participants reported being admitted to the ED at least once, 16% reported being hospitalized at least once, and 16% reported seeing nonphysician health care professionals (nurses, dietitians) at least once. The EQ-5D scores ranged from -0.02 to 1.0 with a mean (SD) of 0.79 (0.18). The mean (SD) EQ-5D index scores (of the EQ-5D-3L questionnaire) of those without anxiety or depression and those with anxiety or depression were 0.82 (0.16) and 0.65 (0.21), respectively; with respect to EQ-5D scores, patients who reported anxiety or depression were significantly different than those who did not report anxiety or depression (*P*<.001). Patients who reported anxiety or depression were also significantly different from those who did not report anxiety or depression with respect to age (*P*=.006), sex, income, multimorbidity, ED visits, 1 HPC item (*P*<.001), and hospitalizations (*P*=.002) (**Table 1**).

Physician's involvement in HPC. Fifty-three percent of patients reported receiving diet counseling, 62% reported receiving exercise counseling, about half of the patients (49%) reported needing their physicians' help in making health changes, and about two-thirds of patients (66%) reported being encouraged by their physicians to talk about their health concerns (**Table 1**).

Multivariate analyses

Indicators of receiving HPC. Female patients were less likely to receive diet (odds ratio [OR] 0.75, 95% CI 0.59 to 0.95) and exercise counseling (OR 0.77, 95% CI 0.60 to 0.98) than male patients were. Those with higher education were more likely to be encouraged by their FPs to talk about their health concerns compared with those with less education (OR 1.55, 95% CI 1.08 to 2.23). Patients with comorbidities were more likely to receive counseling for diet (OR 1.64, 95% CI 1.27 to 2.10) and exercise (OR 1.42, 95% CI 1.11 to 1.83) than for other HPC activities. Respondents who were depressed were twice as likely to indicate the need for their FPs' help to make health changes compared with those who were not depressed (OR 2.02, 95% CI 1.47 to 2.83). However, being depressed was not associated with the likelihood of receiving other HPC activities. Patients who reported seeing health care professionals other than their FPs were twice as likely to receive diet (OR 2.11, 95% CI 1.50 to 2.96) and exercise counseling (OR 2.01, 95% CI 1.41 to 2.87), as well as to indicate needing their physicians' help to make health changes (OR 2.17, 95% CI 1.56 to 3.01), than those who did not.

Health promotion counseling and HRQL. Anxiety or depression status was found to be an effect modifier in

Table 1. General characteristics of participants, by anxiety or depression status: *Of 1615 participants, 269 (16.7%) reported having anxiety or depression and 1346 (83.3%) reported not having anxiety or depression.*

VARIABLE	OVERALL, N (%)*†	PARTICIPANTS WITHOUT ANXIETY OR DEPRESSION, N (%)†	PARTICIPANTS WITH ANXIETY OR DEPRESSION, N (%)†	P VALUE‡
Sex				
• Male	729 (45.1)	644 (47.9)	85 (31.6)	**<.001**
• Female	886 (54.9)	702 (52.2)	184 (68.4)	
Age group, y				
• 18-24	43 (2.7)	38 (2.8)	5 (1.9)	**.006**
• 25–44	398 (24.6)	323 (24.0)	75 (27.9)	
• 45–64	755 (46.8)	614 (45.6)	141 (52.4)	
• ≥65	419 (25.9)	371 (27.6)	48 (17.8)	
Education level				
• Grade school or high school	252 (15.7)	211 (15.7)	41 (15.5)	.944
• High school diploma	344 (21.4)	289 (21.6)	55 (20.8)	
• Postsecondary	1010 (62.9)	841 (62.7)	169 (63.8)	
Income, $				
• <30 000	279 (20.0)	204 (17.6)	75 (31.3)	**<.001**
• 30 000-60 000	377 (27.0)	307 (26.5)	70 (29.2)	
• 60 000-100 000	380 (27.1)	324 (28.0)	56 (23.3)	
• >100 000	362 (25.9)	323 (27.9)	39 (16.3)	
Multimorbidity				
• ≤1 chronic condition	747 (46.3)	679 (50.5)	68 (25.3)	**<.001**
• ≥2 chronic conditions	868 (53.8)	667 (49.6)	201 (74.7)	
ED visit during the past year				
• Yes	554 (34.5)	431 (32.2)	123 (46.1)	**<.001**
• No	1050 (65.5)	906 (67.8)	144 (53.9)	
Hospitalization during the past year				
• Yes	254 (15.8)	195 (14.5)	59 (22.0)	**.002**
• No	1358 (84.2)	1149 (85.5)	209 (78.0)	
Having seen a health care professional (ie, nurse or dietitian) during the past year				
• Yes	231 (15.7)	188 (15.4)	43 (17.1)	.515
• No	1240 (84.3)	1031 (84.6)	209 (82.9)	
HPC item 1 (diet counseling by FP)				
• Yes	731 (53.1)	609 (53.5)	122 (51.5)	.535
• No	646 (46.9)	530 (46.5)	116 (48.7)	
HPC item 2 (exercise counseling by FP)				
• Yes	851 (61.5)	704 (61.5)	147 (61.3)	.933
• No	533 (38.5)	440 (38.5)	93 (38.8)	
HPC item 3 (needing physician's help in making health changes)				
• Yes	677 (49.3)	518 (45.8)	159 (66.3)	**<.001**
• No	695 (50.7)	614 (54.2)	81 (33.8)	
HPC item 4 (encouraged by FP to talk about health concerns)				
• Yes	911 (66.0)	759 (66.5)	152 (63.6)	.386
• No	469 (34.0)	382 (33.5)	87 (36.4)	

ED—emergency department, HPC—health promotion counseling.
*Not all respondents answered all questions.
†Some percentages do not add to 100% owing to rounding.
‡Boldface indicates statistical significance (ie, *P*<.05).

this model, and accordingly, the regression analysis was stratified (**Table 2**). In patients with anxiety or depression, there was no significant association between any of the HPC items and HRQL. In contrast, for patients without anxiety or depression, HPC1 ($P = .048$) and HPC3 ($P < .001$) were significantly associated with HRQL after adjustment. Patients who received diet counseling had EQ-5D scores that were 0.03 higher than their counterparts' scores were. Respondents who indicated needing their physicians' help in making health changes had EQ-5D scores that were 0.05 lower on average than their counterparts' scores were.

Health promotion counseling and ED visits. Anxiety or depression status did not appear to modify the relationship between any of the variables and ED visits. The EQ-5D score ($P < .001$), HPC3 ($P = .013$), and HPC4 ($P = .009$) were significantly associated with ED visits (**Table 3**). Patients who needed their physicians' help in

making health changes were 1.43 (95% CI 1.08 to 1.89) times more likely to have been admitted to EDs than their counterparts were. Patients who were encouraged by their physicians to talk about their health concerns were less likely to have been admitted to EDs compared with those who were not encouraged (OR 0.69, 95% CI 0.52 to 0.91).

Health promotion counseling and hospitalizations. Anxiety or depression status did not appear to modify the relationship between any of the variables and hospitalizations. None of the HPC items was found to be related to hospitalizations (**Table 3**).

DISCUSSION

Despite the fact that HPC is an important role of primary care physicians, we found that only about 50% to

Table 2. Multivariate models of the relationship between HRQL (EQ-5D) and HPC

PREDICTOR VARIABLE	MODEL A*†‡ (PARTICIPANTS WITHOUT ANXIETY OR DEPRESSION)		MODEL B*‡§ (PARTICIPANTS WITH ANXIETY OR DEPRESSION)	
	β COEFFICIENT	P VALUE	β COEFFICIENT	P VALUE
HPC item 1 (diet counseling by FP)	0.027	**.048**	–0.016	.651
HPC item 2 (exercise counseling by FP)	–0.002	.881	–0.004	.920
HPC item 3 (needing physician's help in making health changes)	–0.047	**<.001**	–0.052	.095
HPC item 4 (encouraged by FP to talk about health concerns)	–0.008	.518	–0.028	.359
Seeing a nurse or dietitian	0.008	.583	0.024	.515
Multimorbidity	–0.045	**<.001**	–0.089	**.010**

EQ-5D—Euro quality of life 5-dimensions, HPC—health promotion counseling, HRQL—health-related quality of life.
*Adjusted for age, sex, education level, and income.
†Model A: $R^2 = 0.08$, overall model F test = 7.57 ($P < .001$).
‡Boldface indicates statistical significance (ie, $P < .05$).
§Model B: $R^2 = 0.13$, overall model F test = 2.98 ($P = .002$).

Table 3. Logistic regression models of the relationship between the use of health care services and HPC

PREDICTOR VARIABLE	ED VISITS, OR*†‡ (95% CI)	HOSPITALIZATIONS, OR** (95% CI)
HPC item 1 (diet counseling by FP)	0.83 (0.60–1.14)	1.11 (0.82–1.84)
HPC item 2 (exercise counseling by FP)	0.88 (0.63–1.22)	0.88 (0.58–1.34)
HPC item 3 (needing physician's help in making health changes)	**1.43 (1.08–1.89)**	1.02 (0.70–1.43)
HPC item 4 (encouraged by FP to talk about health concerns)	**0.69 (0.52–0.91)**	1.02 (0.70–1.80)
Seeing a nurse or dietitian	1.20 (0.85–1.70)	1.18 (0.77–1.80)
Multimorbidity	1.24 (0.94–1.63)	1.62 (1.13–2.31)
Anxiety or depression	1.13 (0.80–1.60)	1.20 (0.79–1.82)
EQ-5D score	**0.21 (0.09–0.45)**	0.21 (0.08–0.50)

ED—emergency department, EQ-5D—Euro quality of life 5-dimensions, HPC—health promotion counseling, OR—odds ratio.
*Adjusted for age, sex, education level, and income.
†Boldface indicates statistical significance (ie, $P < .05$).
‡Pseudo $R^2 = 0.05$, likelihood ratio $\chi^2 = 75.97$ ($P < .001$).

60% of patients with self-reported chronic conditions reported receiving such counseling from their FPs. This is consistent with other studies that explored HPC and reported that these counseling activities were relatively limited.[2,18-21]

The finding that HPC, particularly diet counseling, is associated with better HRQL in patients with chronic conditions has been reported elsewhere.[22,23] An intriguing observation in our study is the modifying effect of mental health status on the relationship between HPC and HRQL. There was an association between 2 HPC items and HRQL in patients who did not report having anxiety or depression; however, this was not observed in individuals with anxiety or depression. This implies that individuals with anxiety or depression might be less likely to engage in and benefit from any of the advised activities. Similar effects have been observed in cases with diabetes patients, in which depression was reported to adversely influence the effect of behaviour interventions on glycemic control and self-care behaviour,[24] and was associated with decrements in a range of quality-of-life indices, as well as preventive self-care practices.[25]

Reporting the need for physician's help to make changes to prevent illness was positively associated with ED visits, and encouragement by the personal doctor to talk about all health concerns was negatively associated with ED visits. The former finding could be owing to the fact that people who need their physicians' help to make health changes are either in a compromised health condition or they lack the capacity to make these changes,[26,27] which in both cases could lead to adverse health outcomes,[28] and thus more use of health care services including ED visits.

The latter finding is equally interesting. It seems that patients who were encouraged to talk about their health concerns did not visit the ED as much as those who were not. It could be that when patients talk about their health concerns, FPs are more likely to identify patients' health needs and problems,[3,29] and consequently provide them with the needed health services or refer them to other specialists. However, these relationships were not observed between HPC and hospitalizations. Health-related quality of life and multimorbidity were the only factors associated with hospitalizations. No study, to our knowledge, has explored the association between HPC and hospitalizations. More research is needed to further explore this relationship.

Limitations

This study has a few limitations that should be considered. First, although the data used in this study were from a large population-based survey, they were self-reported data, which are subject to potential recall bias. Because under-reporting is the most frequent problem with self-reported use of health care services data,[30] this could lead to underestimation of the observed associations. Second, the cross-sectional nature of the data did not allow us to draw any conclusions regarding the direction of associations between HPC and health outcomes. Third, only the available HPC items in the survey were included in this analysis, and these did not cover all areas of behaviour counseling for patients with chronic conditions. Nevertheless, the included items were among the most commonly studied in relation to outcomes as observed in the literature. Finally, we included all the variables measured in the survey that could be related to HPC; however, there are other factors that could affect the observed relationships, such as self-care management, adherence, self-efficacy, and health literacy, but data on these variables were not available.

Conclusion

Our findings suggest that not all individuals with chronic conditions are receiving HPC from their FPs. Additionally, this study showed an association between HPC and important health outcomes (HRQL and ED visits), but these associations were not apparent for individuals with anxiety or depression. Further research should explore the barriers to HPC by FPs for patients with chronic conditions and should consider a longitudinal approach to better understand the relationship between counseling and outcomes, as well as the potential mediating role of mental health.

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Contributors
Dr Al Sayah contributed to planning and designing this study, conducting the analysis and interpretation of the findings, writing the first draft of this manuscript, and revising the subsequent drafts, and approved the final version to be published. **Dr Agborsangaya** contributed to the analysis and interpretation of the findings, revised all the drafts of the manuscript, and approved the final version to be published. **Dr Lahtinen** provided and approved the use of the Health Quality Council of Alberta data for this analysis, contributed to the interpretation of the findings, revised all the drafts of the manuscript, and approved the final version to be published. **Dr Cooke** provided and approved the use of the Health Quality Council of Alberta data for this analysis, contributed to the interpretation of the findings, revised all the drafts of the manuscript, and approved the final version to be published. **Dr Johnson** contributed to the planning and designing of this study, interpretation of the findings, revised all the drafts of the manuscript, and approved the final version to be published.

Competing interests
None declared

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