

Cohort study of team-based care among marginalized people who use drugs in Ottawa

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Abstract

Objective To describe team-based care use among a cohort of people who use drugs (PWUD) and to determine factors associated with receipt of team-based care.

Design A cohort study using survey data collected between March and December 2013. These data were then linked to provincial-level health administrative databases to assess patterns of primary care among PWUD in the 2 years before survey completion.

Setting Ottawa, Ont.

Participants Marginalized PWUD 16 years of age or older.

Main outcome measures Patients were assigned to primary care models based on survey responses and then were categorized as attached to team-based medical homes, attached to non-team-based medical homes, not attached to a medical home, and no primary care. Descriptive statistics and multinomial logistic regression were used to determine associations between PWUD and medical home models.

Results Of 663 total participants, only 162 (24.4%) received team-based care, which was associated with high school level of education (adjusted odds ratio [AOR]=2.18; 95% CI 1.13 to 4.20), receipt of disability benefits (AOR=2.47; 95% CI 1.22 to 5.02), and HIV infection (AOR=2.88; 95% CI 1.28 to 6.52), and was inversely associated with recent overdose (AOR=0.49; 95% CI 0.25 to 0.94). In comparison, 125 (18.8%) received non-team-based medical care, which was associated with university or college education (AOR=2.31; 95% CI 1.04 to 5.15) and mental health comorbidity (AOR=4.18; 95% CI 2.33 to 7.50), and was inversely associated with being detained in jail in the previous 12 months (AOR=0.51; 95% CI 0.28 to 0.90).

Conclusion Although team-based, integrated models of care will benefit disadvantaged groups the most, few PWUD receive such care. Policy makers should mitigate barriers to physician care and improve integration across health and social services.

Editor's key points

- ▶ Overall attachment to medical homes among marginalized people who use drugs (PWUD) in Ottawa, Ont, is substantially lower than among the general Ontario population. Only one-quarter of PWUD receive care in team-based medical home models.
- ▶ Attachment to a team-based medical home is associated with high school level of education, receipt of disability benefits, and HIV infection, and is inversely associated with those who have experienced a recent overdose.
- ▶ Stigma and discrimination are both likely to be reasons for suboptimal medical home attachment among PWUD.

Points de repère du rédacteur

► Dans l'ensemble, le rattachement à un centre de médecine de famille chez les personnes marginalisées qui consomment des drogues (PQCD) à Ottawa (Ontario) est considérablement moins élevé que dans la population ontarienne en général. Seulement le quart des PQCD reçoivent des soins dans des modèles semblables à celui du centre de médecine de famille en équipe.

► Le rattachement à un centre de médecine en équipe est associé à une scolarité du niveau secondaire, à la réception de prestations pour incapacité et à une infection au VIH, et est inversement associé aux personnes ayant vécu une surdose récente.

► La stigmatisation et la discrimination sont 2 des raisons probables expliquant un rattachement sous-optimal à un centre de médecine de famille chez les PQCD.

Étude de cohorte sur les soins en équipe aux personnes marginalisées consommant des drogues à Ottawa

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Résumé

Objectif Décrire le recours aux soins en équipe dans une cohorte de personnes qui consomment des drogues (PQCD) et déterminer les facteurs associés à la réception de soins en équipe.

Type d'étude Une étude de cohorte à l'aide des données d'un sondage, recueillies entre mars et décembre 2013. Ces données ont ensuite été corrélées avec des bases de données administratives provinciales sur la santé pour évaluer les tendances liées aux soins primaires chez les PQCD durant les 2 années précédant le sondage.

Contexte Ottawa (Ontario).

Participants Des PQCD marginalisées de 16 ans et plus.

Principaux paramètres à l'étude Les patients ont été assignés à des modèles de soins primaires en se fondant sur les réponses au sondage et classés par la suite selon qu'ils étaient rattachés à un centre de médecine de famille en équipe ou à un centre de médecine de famille non en équipe, ou non rattachés à un centre de médecine et sans soins primaires. Des statistiques descriptives et une régression logistique multinomiale ont été utilisées pour déterminer les associations entre les PQCD et les modèles de centres de médecine.

Résultats Parmi les 663 participants au total, seulement 162 (24,4 %) recevaient des soins en équipe, ce qui était associé à une scolarité du niveau secondaire (rapport de cotes rajusté [RCR]=2,18; IC à 95 % de 1,13 à 4,20), à la réception de prestations pour incapacité (RCR=2,47; IC à 95 % de 1,22 à 5,02) et à une infection au VIH (RCR=2,88; IC à 95 % de 1,28 à 6,52), et inversement associé à une récente surdose (RCR=0,49; IC à 95 % de 0,25 à 0,94). Par comparaison, 125 (18,8 %) personnes recevaient des soins médicaux qui n'étaient pas en équipe, ce qui était associé à une scolarité de niveau universitaire ou collégial (RCR=2,31; IC à 95 % de 1,04 à 5,15) et à une comorbidité liée à la santé mentale (RCR=4,18; IC à 95 % de 2,33 à 7,50), et inversement associé au fait d'avoir été détenu en prison au cours des 12 mois précédents (RCR=0,51; IC à 95 % de 0,28 à 0,90).

Conclusion Même si les modèles de soins intégrés et en équipe bénéficient le plus aux groupes défavorisés, peu de PQCD reçoivent de tels soins. Les décideurs devraient atténuer les obstacles aux soins médicaux et améliorer l'intégration dans l'ensemble des services sociaux et de santé.

People who use drugs (PWUD) experience substantial comorbidity, disability,^{1,2} and premature mortality.³ Most PWUD report having unmet health needs,^{4,5} with high associated rates of emergency department visits and hospital admissions for mental health and substance use diagnoses, soft tissue infections, pneumonia, and other issues.⁶⁻⁸ We previously found that multiple emergency department visits were about 50% less likely among a cohort of PWUD if they had a regular family physician⁶; however, only 56.2% of the cohort accessed regular primary care. Although policy makers have emphasized the importance of medical home models in ensuring timely access to the right services⁹ for people with substance use disorder, the literature about actual access is sparse.^{10,11} In general, disadvantaged patients in Canada are less likely to access medical homes, particularly homes with team-based care.^{12,13} A recent study in Ontario has demonstrated that people receiving opioid agonist therapy (OAT) are less likely to receive chronic disease prevention and management than other Ontarians, but are more likely to receive such care if they receive primary care within medical home models, particularly in models with team-based care.¹⁴

The aim of this study was to describe the association of attachment to a medical home among a cohort of PWUD enrolled in the community-based Participatory Research in Ottawa: Understanding Drugs (PROUD) study.¹⁵ We created a unique data set by linking the rich survey responses of the PROUD cohort to provincial health services administrative databases in a single-payer system with first dollar universal coverage for physician services. The objectives were to describe team-based care use among PWUD and to determine factors associated with receipt of team-based care. The main outcome was attachment to a medical home.

— Methods —

Study design

We conducted a cohort study using survey data collected between March and December 2013, and linked those data to provincial-level health administrative databases to assess patterns of primary care in the 2 years before survey completion.

Setting

Ontario has several models of primary care: reimbursement based on fee-for-service, capitation payments based on patient enrolment to a physician, and a combination of both. Capitation models vary organizationally, with some including interprofessional teams (family health teams [FHTs]).¹⁶ Community health centres (CHCs) are a distinct model of interprofessional team care with salaried physician remuneration. For the purposes of this study, we distinguished between interdisciplinary team-based medical homes (FHTs and CHCs) and

non-team-based medical homes (family health groups, family health networks, non-FHT family health organizations, and comprehensive care models).

Data sources

As described previously,¹⁵ the cross-sectional PROUD study used a street-based peer recruitment and snowball sampling approach to recruit and enrol participants, focusing on socially and economically marginalized PWUD. Eligibility criteria included being 16 years of age or older and having injected or smoked drugs other than marijuana in the 12 months before enrolment (March to December 2013). Participants completed a peer- or medical student-administered survey with questions about sociodemographic information, substance use, environmental-structural factors, and health and social services use. The PROUD study activities are governed by a community advisory committee of PWUD and allies.

We linked consenting participants' survey responses with health administrative databases held at ICES, an independent non-profit research institute in Toronto, Ont, whose legal status under Ontario's health information privacy laws allows it to collect and analyze health care and demographic data without consent for the purposes of health system evaluation and improvement (Supplemental Table 1, available from **CFPlus***). The ICES data sets employ unique encoded identifiers, which were used to link PROUD participants deterministically based on their reported Ontario Health Insurance Plan (OHIP) numbers if available, or probabilistically based on their names, dates of birth, and postal codes. Following linkage, we identified participants with duplicate enrolment and retained responses with the most complete data. Data sets were analyzed at ICES.

Variables

We categorized gender using self-reported gender in the PROUD survey except when gender was missing or when participants reported gender as "2-spirit" or "other"; in that case, we used data from health cards. We excluded transgender individuals because of the risk of re-identification (<6 participants). We used postal codes to assign neighbourhood income into quintiles. We classified comorbidity using the Johns Hopkins Adjusted Clinical Group System case-mix assignment software, version 10.¹⁷ Comorbidity was classified as low (≤ 5 aggregated diagnosis groups [ADGs]), medium (6 to 9 ADGs), or high (≥ 10 ADGs). We used validated ICES algorithms to classify the prevalence of mental health conditions (Supplemental Table 2a, available from **CFPlus***)¹⁸ and HIV infection, defined by having 3 or more physician claims in 3 years with OHIP diagnosis codes of 042, 043, or 044.¹⁹ We calculated the number of primary care visits from the OHIP and CHC databases.

*Supplementary tables 1 to 4 are available from <https://www.cfp.ca>. Go to the full text of the article online and click on the **CFPlus** tab.

Outcomes

We used enrolment tables provided by the Ontario Ministry of Health and Long-Term Care to assign family physicians to patients who were formally rostered in a primary care model on their PROUD survey date. Unrostered patients were assigned in 2 steps: first, we virtually rostered patients to the family physician responsible for most of each patient's costs of primary care services in the previous 2 years.²⁰ We excluded visits that were only for opioid substitution therapy, as there is debate among our community advisory committee and in the literature about the extent of primary care services provided within specialized OAT clinics^{14,21} (Supplemental Table 2b, available from **CFPlus***). Second, for patients who received any care at CHCs, which do not submit billing codes to OHIP, we determined whether the virtually rostered physician or the CHC physician provided most of the visits, and then assigned the patient to the appropriate physician. We then categorized patients based on the practice model of their family physician: attached to a team-based medical home (FHTs and CHCs); attached to a non-team-based medical home; not attached to a medical home; and no primary care.²²

Analyses

We used descriptive statistics to summarize our cohort, stratified by primary care model, and included measures of central tendencies and dispersion. We compared patient characteristics between primary care models using Wilcoxon rank sum tests for continuous variables and χ^2 tests or Fisher exact tests as appropriate for categorical variables. We used multinomial logistic regression to analyze variables associated with being in a team-based or a non-team-based medical home and included all potential covariates, guided by our understanding of access to care. We used a nonparsimonious approach based on conceptual understanding, as guided by our community advisory committee, but excluded those that we judged likely to be collinear (such as "sex work ever" and "received drugs, money, or gifts for sex in the past 12 months"). For several PROUD variables, participants could respond with "no answer" or "do not know or unsure"; some variables had missing values because of human error. Our primary analyses used a complete case approach; we also conducted a sensitivity analysis in which response categories were dichotomized (yes vs no), with the "no" category including any response other than "yes." We reported associations as odds ratios with 95% CIs. Cell sizes of 6 or less were reported in aggregate. We used SAS statistical software, version 9.4, to conduct all analyses.

This study received approval from the Ottawa Health Science Network Research Ethics Board. The use of administrative data was authorized under section 45

of Ontario's Personal Health Information Protection Act, which does not require review by a research ethics board.

— Results —

Between March and December 2013, 858 PROUD participants completed the survey and 798 agreed to be linked to ICES. After duplicate enrolment data and participants without OHIP were excluded, 663 participants were successfully linked. Demographic characteristics have been reported previously and are shown in Supplemental Table 3, available from **CFPlus**.^{6*} We compared PROUD participants by medical home model based on their primary care assignment in the 2 years before completion: 162 (24.4%) were assigned to a team-based medical home, 125 (18.8%) to a non-team-based medical home, 252 (38.0%) to a non-medical home, and 124 (18.7%) received no care. Descriptive comparisons by medical home model are shown in **Table 1**.²³

In our complete case multivariable analysis ($n=533$; **Table 2**),²³ after adjustment we found the following: when compared with no attachment to a medical home (ie, non-medical home and no care combined), attachment to a team-based medical home was associated with high school education (adjusted odds ratio [AOR]=2.18; 95% CI 1.13 to 4.20), receipt of disability benefits (AOR=2.47; 95% CI 1.22 to 5.02), and HIV infection (AOR=2.88; 95% CI 1.28 to 6.52), and was inversely associated with recent overdose (AOR=0.49; 95% CI 0.25 to 0.94). Attachment to a non-team-based model, when compared with attachment to a non-medical home and no care combined, was associated with university or college education (AOR=2.31; 95% CI 1.04 to 5.15) and mental health comorbidity (AOR=4.18; 95% CI 2.33 to 7.50), and was inversely associated with being detained in jail in the previous 12 months (AOR=0.51; 95% CI 0.28 to 0.90).

In the sensitivity analysis where we collapsed all "no answer," "do not know," and missing responses with "no" responses, effect sizes between models were similar (Supplemental Table 4, available from **CFPlus***).

— Discussion —

Our community-based participatory research approach allowed us to gather survey data from a marginalized population of PWUD, which we then linked to population-level data in a setting with universal health insurance and a variety of primary care organizational models. While we found that those with HIV infection, with mental health comorbidity, and on disability support were more likely to be in medical home models, overall attachment to any medical home was low (43.3%) compared with more than 80% for the Ontario population as a whole in 2011.^{12,20} We also found that some substantially disadvantaged groups were omitted, such as people with less formal education, those who have experienced

Table 1. PROUD participant descriptive characteristics by medical home model: N = 663.

VARIABLE	MEDICAL HOME		NON-ATTACHMENT TO MEDICAL HOME		P VALUE
	TEAM BASED (n = 162)	NON-TEAM BASED (n = 125)	NON-MEDICAL HOME (n = 252)	NO PRIMARY CARE (n = 124)	
Demographic characteristics					
Age, y					
• Mean (SD)	43.97 (10.59)	41.93 (11.31)	39.82 (10.47)	40.86 (10.54)	.002
• Median (IQR)	46 (38-52)	43 (33-52)	41 (31-48)	42 (33-48)	<.001
Age category, y, n (%)					
• ≤24	8 (4.9)	10 (8.0)	25 (9.9)	11 (8.9)	.086
• 25-34	25 (15.4)	30 (24.0)	54 (21.4)	25 (20.2)	
• 35-44	41 (25.3)	27 (21.6)	75 (29.8)	39 (31.5)	
• ≥45	88 (54.3)	58 (46.4)	98 (38.9)	49 (39.5)	
Gender, n (%)					
• Male	110 (67.9)	96 (76.8)	194 (77.0)	101 (81.5)	.049
• Female	52 (32.1)	29 (23.2)	58 (23.0)	23 (18.5)	
Ethnicity, n (%)					
• Indigenous only	33 (20.4)	13 (10.4)	43 (17.1)	31 (25.0)	
• Other	129 (79.6)	112 (89.6)	209 (82.9)	93 (75.0)	.021
First language, n (%)					
• French	32 (19.8)	14 (11.2)	35 (13.9)	21 (16.9)	.026
• English	120 (74.1)	104 (83.2)	202 (80.2)	86 (69.4)	
• Other or no answer	10 (6.2)	7 (5.6)	15 (6.0)	17 (13.7)	
Sexual orientation, n (%)					
• Straight	139 (85.8)	115 (92.0)	222 (88.1)	111 (89.5)	.418
• LGBTQ+	23 (14.2)	10 (8.0)	30 (11.9)	13 (10.5)	
Neighbourhood of residence, n (%)					
• Market or Lowertown	60 (37.0)	51 (40.8)	103 (40.9)	59 (47.6)	.122
• Centretown	34 (21.0)	13 (10.4)	49 (19.4)	21 (16.9)	
• Other	68 (42.0)	61 (48.8)	100 (39.7)	44 (35.5)	
Neighbourhood income quintile, n (%)					
• 1 (lowest)	66 (40.7)	38 (30.4)	105 (41.7)	37 (29.8)	<.001
• 2	56 (34.6)	39 (31.2)	61 (24.2)	40 (32.3)	
• 3	28 (17.3)	34 (27.2)	53 (21.0)	29 (23.4)	
• 4 and 5 (highest)	12 (7.4)	14 (11.2)	29 (11.5)	9 (7.3)	
• Missing	≤6	≤6	≤6	9 (7.3)	
Highest level of education, n (%)					
• Some high school or less	72 (44.4)	45 (36.0)	126 (50.0)	65 (52.4)	.008
• High school graduate or GED	40 (24.7)	37 (29.6)	77 (30.6)	39 (31.5)	
• Some college or university	33 (20.4)	24 (19.2)	28 (11.1)	14 (11.3)	
• College or university completed	17 (10.5)	19 (15.2)	21 (8.3)	6 (4.8)	

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VARIABLE	MEDICAL HOME		NON-ATTACHMENT TO MEDICAL HOME		P VALUE
	TEAM BASED (n = 162)	NON-TEAM BASED (n = 125)	NON-MEDICAL HOME (n = 252)	NO PRIMARY CARE (n = 124)	
Provincial social assistance benefits, n (%)					
• Disability payments (Ontario Disability Support Program)	119 (73.5)	70 (56.0)	129 (51.2)	24 (19.4)	<.001
• Income assistance (Ontario Works)	26 (16.0)	35 (28.0)	77 (30.6)	26 (21.0)	
• Other (Trillium Support Services, those ≥ 65 y, no benefits)	17 (10.5)	20 (16.0)	46 (18.3)	74 (59.7)	
Comorbidity, n (%)					
• No comorbidity (0 ADGs)	10 (6.2)	≤6	≤6	70-75	<.001
• Low comorbidity (1-5 ADGs)	71 (43.8)	40 (32.0)	100 (39.7)		
• Medium comorbidity (6-9 ADGs)	28 (17.3)	38 (30.4)	85 (33.7)	18 (14.5)	
• High comorbidity (≥ 10 ADGs)	53 (32.7)	45-50	67 (26.6)	≤6	
Social characteristics, n (%)					
Received drugs, money, or gifts for sex in the past 12 mo	24 (14.8)	13 (10.4)	31 (12.3)	14 (11.3)	.688
Stable housing	77 (47.5)	52 (41.6)	94 (37.3)	25 (20.2)	<.001
Ever red-zoned*	61 (37.7)	30 (24.0)	92 (36.5)	29 (23.4)	.005
Detained in jail overnight or longer ever	127 (78.4)	93 (74.4)	198 (78.6)	92 (74.2)	.670
Detained in jail overnight or longer in the past 12 mo	50 (30.9)	40 (32.0)	119 (47.2)	43 (34.7)	.002
Drug use characteristics, n (%)					
Ever injected drugs	127 (78.4)	78 (62.4)	186 (73.8)	71 (57.3)	<.001
Drug use in the past 12 mo					
• Any injection	88 (54.3)	52 (41.6)	135 (53.6)	51 (41.1)	.021
• Noninjection use of only nonopioids	58 (35.8)	57 (45.6)	94 (37.3)	62 (50.0)	.037
• Noninjection drug use of both opioids and nonopioids	104 (64.2)	68 (54.4)	156 (61.9)	62 (50.0)	.048
Ever injected with used needle	55 (34.0)	28 (22.4)	71 (28.2)	31 (25.0)	.148
Ever injected with unknown needle	40 (24.7)	18 (14.4)	48 (19.0)	20 (16.1)	.122
Frequency of injecting with others in the past 12 mo					
• Always	21 (13.0)	13 (10.4)	34 (13.5)	13 (10.5)	.258
• Most of time	15 (9.3)	6 (4.8)	16 (6.3)	9 (7.3)	
• Usually, sometimes, or occasionally	39 (24.1)	22 (17.6)	62 (24.6)	17 (13.7)	
• Never	11 (6.8)	11 (8.8)	22 (8.7)	10 (8.1)	
• Other	76 (46.9)	73 (58.4)	118 (46.8)	75 (60.5)	
Location of injection drug use					
• House or apartment	30 (18.5)	12 (9.6)	42 (16.7)	16 (12.9)	.146
• Public place	132 (81.5)	113 (90.4)	210 (83.3)	108 (87.1)	

Table 1 continued on page 123

Table 1 continued from page 122

VARIABLE	MEDICAL HOME		NON-ATTACHMENT TO MEDICAL HOME		P VALUE
	TEAM BASED (n = 162)	NON-TEAM BASED (n = 125)	NON-MEDICAL HOME (n = 252)	NO PRIMARY CARE (n = 124)	
Most frequent location of injection drug use					
• House or apartment	62 (38.3)	34 (27.2)	85 (33.7)	26 (21.0)	.009
• Public place	100 (61.7)	91 (72.8)	167 (66.3)	98 (79.0)	
Ever overdosed	90 (55.6)	51 (40.8)	117 (46.4)	44 (35.5)	.005
Overdosed in the past 12 mo	21 (13.0)	21 (16.8)	55 (21.8)	16 (12.9)	.058
Taken to ED or hospital after last overdose	39 (24.1)	27 (21.6)	61 (24.2)	17 (13.7)	.106
Health characteristics, n (%)					
Self-reported health status					
• Excellent or very good	34 (21.0)	28 (22.4)	61 (24.2)	31 (25.0)	.168
• Good	53 (32.7)	44 (35.2)	96 (38.1)	56 (45.2)	
• Fair, poor, or no answer	75 (46.3)	53 (42.4)	95 (37.7)	37 (29.8)	
Ever had suicidal ideation	107 (66.0)	79 (63.2)	137 (54.4)	66 (53.2)	.043
Ever attempted suicide	69 (42.6)	41 (32.8)	81 (32.1)	36 (29.0)	.068
Attempted suicide in the past 12 mo	17 (10.5)	17 (13.6)	21 (8.3)	6 (4.8)	.099
HIV infection	25 (15.4)	≤6	18 (7.1)	≤6	<.001
Mental health condition (excluding substance use)	82 (50.6)	91 (72.8)	149 (59.1)	19 (15.3)	<.001
Ever got tested for hepatitis C virus	143 (88.3)	93 (74.4)	221 (87.7)	105 (84.7)	.029
Reported last hepatitis C virus test results					
• Positive	84 (51.9)	37 (29.6)	101 (40.1)	36 (29.0)	<.001
• Negative	50 (30.9)	46 (36.8)	112 (44.4)	60 (48.4)	
• No answer, do not know, or missing	28 (17.3)	42 (33.6)	39 (15.5)	28 (22.6)	
Health care use					
Received support from peer worker, n (%)	68 (42.0)	49 (39.2)	109 (43.3)	51 (41.1)	.898
Received support from social support organization, n (%)	102 (63.0)	80 (64.0)	143 (56.7)	77 (62.1)	.446
No. of outpatient primary care visits in 1 y before survey completion					
• Mean (SD)	10.30 (18.04)	10.38 (13.58)	13.60 (19.42)	1.49 (6.74)	<.001
• Median (IQR)	3 (1-10)	6 (2-13)	6 (3-14)	0 (0-1)	<.001
Ever took methadone, n (%)	62 (38.3)	40 (32.0)	99 (39.3)	22 (17.7)	<.001
Currently taking methadone, n (%)	49 (30.2)	27 (21.6)	73 (29.0)	14 (11.3)	<.001
Accessed addiction treatment in the past 12 mo, n (%)	42 (26.0)	102 (81.6)	43 (17.1)	52 (41.9)	.303

ADG—aggregated diagnosis group; ED—emergency department; GED—general education development; IQR—interquartile range; LGBTQ+—lesbian, gay, bisexual, trans, queer or questioning, and members of related communities; PROUD—Participatory Research in Ottawa: Understanding Drugs.

*Red-zoned means receiving conditions from the police or a judge not to be in certain parts of the city.²³

Table 2. Multinomial regression complete case analysis of PROUD participant characteristics associated with primary care models (n = 533): Excluded from medical home was used as the reference variable.*

VARIABLE	TEAM-BASED MEDICAL HOME, AOR (95% CI)	NON-TEAM-BASED MEDICAL HOME, AOR (95% CI)
Demographic characteristics		
Age	1.02 (0.99-1.04)	1.03 (1.00-1.05)
Gender		
• Male	0.77 (0.42-1.39)	0.79 (0.40-1.54)
• Female	Reference	Reference
Ethnicity		
• Indigenous	0.88 (0.47-1.66)	0.82 (0.39-1.70)
• Other	Reference	Reference
Income quintile		
• 1 (lowest)	0.87 (0.36-2.07)	0.95 (0.37-2.41)
• 2	1.52 (0.63-3.67)	2.09 (0.82-5.31)
• 3	0.94 (0.37-2.43)	1.77 (0.68-4.64)
• 4 and 5 (highest)	Reference	Reference
Sexual orientation		
• Straight	0.92 (0.45-1.91)	1.87 (0.67-5.26)
• LGBTQ+	Reference	Reference
Highest level of education		
• College or university completed	2.00 (0.91-4.39)	2.31 (1.04-5.15)
• Some college or university	0.74 (0.42-1.31)	1.05 (0.57-1.94)
• High school or GED	2.18 (1.13-4.20)	1.85 (0.89-3.85)
• Some high school or less	Reference	Reference
Provincial social assistance benefits		
• Disability payments (Ontario Disability Support Program)	2.47 (1.22-5.02)	1.01 (0.49-2.08)
• Income assistance (Ontario Works)	1.20 (0.55-2.61)	1.25 (0.59-2.66)
• Other (Trillium Support Services, those ≥65 y, no benefits)	Reference	Reference
Social characteristics		
Received drugs, money, or gifts for sex in the past 12 mo		
• Yes	1.06 (0.47-2.41)	0.93 (0.34-2.53)
• Other	Reference	Reference
Housing situation		
• Stable housing	1.25 (0.74-2.09)	1.43 (0.82-2.52)
• Unstable housing	Reference	Reference
Detained in jail overnight or longer in the past 12 mo		
• Yes	0.65 (0.39-1.08)	0.51 (0.28-0.90)
• Other	Reference	Reference
Ever red-zoned*		
• Yes	1.52 (0.92-2.54)	0.70 (0.38-1.30)
• Other	Reference	Reference

Table 2 continued on page 125

Table 2 continued from page 124

VARIABLE	TEAM-BASED MEDICAL HOME, AOR (95% CI)	NON-TEAM-BASED MEDICAL HOME, AOR (95% CI)
Drug use characteristics		
Ever injected drugs		
• Yes	1.42 (0.73-2.77)	0.99 (0.52-1.88)
• Other	Reference	Reference
Overdose in the past 12 mo		
• Yes	0.49 (0.25-0.94)	0.83 (0.42-1.65)
• Other	Reference	Reference
Health characteristics		
HIV infection		
• Yes	2.88 (1.28-6.52)	0.77 (0.19-3.09)
• No	Reference	Reference
Mental health condition (excluding substance use disorder)		
• Yes	1.22 (0.74-2.01)	4.18 (2.33-7.50)
• No	Reference	Reference
Reported last hepatitis C virus test results		
• Positive	1.23 (0.70-2.17)	0.81 (0.43-1.54)
• Other	Reference	Reference
Health care use		
Received support from peer worker		
• Yes	0.90 (0.57-1.44)	0.93 (0.55-1.58)
• Other	Reference	Reference
Ever took methadone		
• Yes	1.21 (0.71-2.09)	1.08 (0.58-2.04)
• Other	Reference	Reference

AOR—adjusted odds ratio; GED—general education development; LGBTQ+—lesbian, gay, bisexual, trans, queer or questioning, and members of related communities; PROUD—Participatory Research in Ottawa: Understanding Drugs.
 *Excluded includes participants receiving care in non-medical home models or receiving no care.
 †Red-zoned means receiving conditions from the police or a judge not to be in certain parts of the city.²³

imprisonment, and those with recent overdose. We also found that only one-quarter of PWUD were receiving care in team-based, integrated models, despite these models being explicitly designed for people with comprehensive needs, such as FHTs and CHCs.

Medical homes are intended to improve access to comprehensive care for a rostered patient population, and some are enhanced by interdisciplinary teams, including mental health workers.^{13,24,25} Patients in medical homes have improved prevention and management of chronic conditions,^{12,20,22,26} as well as improved access to mental health services.²⁷ Those not belonging to medical homes are also at greater risk of turning to the emergency department for health care services or being admitted to hospital.^{22,28-30} Our findings are consistent with general population studies demonstrating that both team-based and non-team-based models, despite

their intended outcomes, are less likely to care for, and thus benefit, those who need them most, such as people in low-income neighbourhoods, new immigrants, and those with physical and mental health comorbidity,^{12,22,31} even in our setting with universal access to physician services. Our results are also aligned with a recent study in Ontario that found that people receiving OAT are less likely to receive prevention and management of chronic conditions compared with matched controls.¹⁴ While rates of medical home attachment were similar to those found in our study, that population also found that medical home attachment, in particular to team-based care, improved the primary care received.

The reasons for suboptimal medical home attachment despite the many health care needs of PWUD are likely multifold. Stigma remains a serious barrier to receipt of primary care among people with substance

use disorders.³² Specifically, discrimination directly corresponds to unmet care needs by this population.³³ We have previously found that the one-third of the PROUD cohort who had ever received OAT had improved primary care engagement (unpublished data), and that addictions treatment had the potential to link PWUD to primary care. However, integration of addictions and primary care services remains suboptimal.^{34,35} Given the specialized nature of these services, which are often limited to high-volume OAT providers, the integration of OAT care within medical homes has not had adequate reach in Canada.^{14,21}

Limitations

Our study has some limitations. Survey results comprised self-reported data about highly stigmatized or illegal practices, which may have contributed to reporting biases. We used street-based peer recruitment to improve response and representativeness compared with standard recruitment methods,³⁶ which means that our findings may not be generalizable to non-street-based populations. Finally, ICES data do not capture most visits to non-physician primary care providers, including nurse practitioners, nurses, and other allied health professionals, or visits by people without active health cards, a situation which is not uncommon among very disadvantaged groups.

Conclusion

These findings should spur policy makers to extend the reach of team-based care to mitigate barriers to physician care and improve integration across health and social service needs to help patients with health and social complexity.^{32,37-39} Models to integrate medication-assisted therapy for substance use disorder within primary care should incorporate pharmacologic therapy, psychosocial services, service integration, and education and outreach.⁴⁰

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Contributors

All authors contributed to the concept and design of the study; data gathering, analysis, and interpretation; and preparing the manuscript for submission.

Competing interests

None declared

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