Family-centred care delivery

Comparing models of primary care service delivery in Ontario

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Abstract

Objective To determine whether models of primary care service delivery differ in their provision of family-centred care (FCC) and to identify practice characteristics associated with FCC.

Design Cross-sectional study.

Setting Primary care practices in Ontario (ie, 35 salaried community health centres, 35 fee-for-service practices, 32 capitation-based health service organizations, and 35 blended remuneration family health networks) that belong to 4 models of primary care service delivery.

Participants A total of 137 practices, 363 providers, and 5144 patients.

Main outcome measures Measures of FCC in patient and provider surveys were based on the Primary Care Assessment Tool. Statistical analyses were conducted using linear mixed regression models and generalized estimating equations.

Results Patient-reported FCC scores were high and did not vary significantly by primary care model. Larger panel size in a practice was associated with lower odds of patients reporting FCC. Provider-reported FCC scores were significantly higher in community health centres than in family health networks ($P=.035$). A larger number of nurse practitioners and clinical services on-site were both associated with higher FCC scores, while scores decreased as the number of family physicians in a practice increased and if practices were more rural.

Conclusion Based on provider and patient reports, primary care reform strategies that encourage larger practices and more patients per family physician might compromise the provision of FCC, while strategies that encourage multidisciplinary practices and a range of services might increase FCC.

EDITOR'S KEY POINTS

- In Ontario, different models of primary care service delivery coexist. The organization and remuneration of primary care services might influence many aspects of quality of care and provider behaviour. Therefore, it is important to evaluate these models in order to better understand their performance and function.
- This study found that patients and providers reported high levels of family-centred care in all models of primary care service delivery.
- Various sociodemographic characteristics are associated with patient-reported family-centred care and should be taken into account in future research.

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La prestation de soins axés sur la famille

Comparaison de différents modèles pour la prestation des soins de première ligne en Ontario

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Résumé

Objectif Déterminer si les modèles de prestation des soins primaires diffèrent en termes de soins axés sur la famille (SAF) et identifier les caractéristiques de pratiques associées à des SAF.

Type d'étude Étude transversale.

Contexte Établissements ontariens de soins primaires (c.-à-d. 35 centres de santé communautaires rémunérés à salaire, 35 établissements rémunérés à l'acte, 32 organisations offrant des services de santé en régime de capitation et 35 réseaux de santé familiale diversement rémunérés) correspondant à 4 modèles de prestation de services de soins primaires.

Participants Un total de 137 établissements, 363 soignants et 5144 patients.

Principaux paramètres à l'étude On a mesuré les SAF à partir d'enquêtes auprès des patients et des soignants à l'aide du Primary Care Assessment Tool. Les analyses statistiques ont été effectuées à l'aide de modèles de régression linéaire mixtes et d'équations d'estimation généralisées.

Résultats Les scores de SAF rapportés par les patients étaient élevés, sans différence significative entre les différents modèles de soins primaires. Dans les établissements de plus grande taille, les patients avaient tendance à rapporter des scores de SAF plus faibles. Dans les centres de santé communautaire, les soignants rapportaient des scores de SAF plus élevés que dans les réseaux de santé familiale (P = .035). La présence locale d'un bon nombre d'infirmières et d'infirmiers praticiens et de services cliniques était associée à des scores de SAF plus élevés, tandis qu'on observait des scores plus faibles quand le nombre de médecins de famille d'un établissement augmentait ou quand les établissements étaient plus ruraux.

Conclusion Selon les rapports des soignants et des patients, les stratégies de la réforme des soins primaires qui préconisent des établissements de pratique plus grands et davantage de patients par médecin de famille pourraient compromettre la prestation de SAF, alors que celles qui préconisent des pratiques multidisciplinaires et une variété de services pourraient favoriser les SAF.

POINTS DE REPÈRE DU RÉDACTEUR

- En Ontario, il existe plusieurs modèles différents pour la prestation des services de soins de première ligne. L'organisation de ces services et la forme de rémunération pourraient influencer plusieurs aspects de la qualité des soins ainsi que le comportement des soignants. Il est donc important d'évaluer ces modèles, de façon à mieux comprendre leur rendement et leur fonction.
- Dans cette étude, patients et soignants rapportaient des soins axés sur la famille de haut niveau, et ce, pour tous les modèles offrant des soins de première ligne.
- On observait une association entre la qualité des soins axés sur la famille rapportée par les patients et diverses caractéristiques sociodémographiques; on devrait tenir compte de ces caractéristiques dans les études futures.

Cet article a fait l'objet d'une révision par des pairs.
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Family-centred care (FCC) involves consideration of the family in managing a clinical case[1] and is fundamental to the Institute of Medicine's definition of *primary care*.[2] Family-centred care includes consideration of hereditary conditions in the patient's family, household income, and living situations, as well as awareness of the signs of child abuse.[3] While direct involvement of the family in clinical discussions can be part of FCC if the patient desires it, it is not essential, as the critical element of this concept is viewing the patient in the family context. Family-centred care has been proposed as a means of supporting behaviour change in primary care,[4] and there is some evidence that FCC might be associated with increased patient satisfaction.[5] The critical care and pediatric literature on FCC, which is more developed than in the primary care literature, demonstrates associations with improved clinical outcomes and increased patient satisfaction.[6-8]

The conceptual framework for assessing primary care developed by Hogg et al[9] stresses the importance of assessing the influence of structural domains (ie, practice context and organization) on performance domains (ie, health care service delivery and technical quality of care). Family-centred care is included in this conceptual framework as a dimension of the patient-provider relationship within health care service delivery. While evidence exists that certain aspects of the patient-provider relationship can be influenced by hospital organizational characteristics,[10] to our knowledge, there have been no studies to date examining organizational or related factors associated with the provision of FCC. Even with respect to the related concept of patient-centred care,[1] very few studies exist.[11,12] Studies exploring the relationship between practice organizational factors and FCC are therefore needed.

Primary care service delivery

Primary care reform efforts have created a natural experiment in the province of Ontario, where different models of primary care service delivery coexist within the same geographic and political jurisdiction.[13] Evaluation of these models is needed to better understand their performance and function.[13] To date, the organization of and remuneration for primary care services have been found to influence many aspects of quality of care and provider behaviour, including accessibility, continuity of care, chronic disease management, and patient satisfaction.[12,14-16]

In 2006, 4 models of primary care service delivery served 90% of the population of Ontario. These models of primary care include the following: fee-for-service (FFS) practices; community health centres (CHCs), in which physicians receive a set annual salary; health service organizations (HSOs), in which payment is capitation based; and family health networks (FHNs), in which remuneration is principally capitation based but also includes incentive payments and some FFS. Details of these models and their inherent incentives and disincentives have been described elsewhere.[13,17]

The objective of this study was to determine how the 4 models of primary care service delivery differ in terms of provider- and patient-reported FCC, and to identify organizational characteristics associated with provider- and patient-reported FCC.

METHODS

Setting and design

This study was part of the Comparison of Models of Primary Care in Ontario (COMP-PC) study, a cross-sectional, practice-based study carried out in Ontario between June 2005 and June 2006. The 4 models of primary care service delivery that were evaluated (ie, FFS, CHC, FHN, and HSO) were chosen because they covered approximately 90% of the population of Ontario at the time the surveys were carried out. The remaining primary care model types were not included, as the sample size within a given model would have been insufficient for analysis. A survey was administered to primary care practices, as well as their providers and patients, belonging to these 4 models of primary care delivery in order to investigate multiple aspects of quality of care and to evaluate the influence of practice organizational characteristics on these aspects of quality of care. Details of these methods are extensively described elsewhere[18] but will be briefly outlined below. The study was approved by the Ottawa Hospital Research Ethics Board.

Sample

Logistical constraints precluded recruitment of practices in the sparsely populated far north of the province. All CHC (51), FHN (94), and HSO (65) practices from across the rest of the province, along with a random sample of 155 eligible FFS practices, were approached to participate in the study. The recruitment target of 35 practices per model and 50 patients per practice was based on the original sample size calculation for the COMP-PC study.[18] Practices were eligible if they provided general primary care services and more than 50% of their providers agreed to participate. Patients were recruited sequentially in the waiting room over 1 to 3 days until recruitment targets were achieved. Patients were invited to participate by the practice receptionist, and they were eligible if they were older than 18 years of age, were not acutely ill or cognitively impaired, and were able to complete the survey in English or French, either directly or with the assistance of a translator. To evaluate the presence of selection bias, participating practices were compared with all other practices in Ontario within the given model using provincial health administrative data.

Instruments

Surveys were adapted from the adult edition of Starfield's Primary Care Assessment Tool (PCAT)[19,20] and included questions on several aspects of quality of care, including FCC, that were to be evaluated for the COMP-PC project. Patient surveys captured sociodemographic factors (eg, age, sex, ethnicity, education, household income), health status indicators (eg, diagnosis of chronic disease), history with the practice (eg, length of time attending the practice, number of household members attending the practice), and the patient's experience concerning various dimensions of health care service delivery. Practice surveys were completed by the office manager or lead physician. We collected information to link patient data to the practice but not to their providers.

Primary outcomes

Primary outcomes used in this study were provider-reported FCC and patient-reported FCC. These were measured using the family-centredness scales in the validated adult version of the PCAT.[19]

The provider-reported family-centredness scale was made up of a series of 14 questions related to attitudes and processes of FCC. Responses to each question were based on a 4-point Likert scale (definitely=4, probably=3, probably not=2, definitely not=1), while "not sure/don't know" was considered a missing response. Following PCAT guidelines, FCC scores were calculated as the mean score across questions, reported as a proportion (mean score/4), and analyzed as a continuous variable.[21]

The patient-reported family-centredness scale was made up of 3 questions related to experiences and perceptions of FCC. As with the provider questions, responses were on a 4-point Likert scale (definitely=4, probably=3, probably not=2, definitely not=1), while "not sure/don't know" was considered a missing response. As this score was based on responses to only 3 questions, its distribution was discontinuous and highly skewed, and was therefore analyzed as a dichotomous variable. Patients who answered "definitely" to 2 or more questions and no worse than "probably" to the third question were categorized as reporting FCC, all others were categorized as not reporting FCC. It was predetermined that providers and patients who responded to less than 50% of the questions on the FCC scale would be excluded from this analysis.

Practice-, provider-, and patient-level factors considered as potential predictors of provider-reported FCC and patient-reported FCC are listed in **Table 1**.

Data analysis

Practice, provider, and patient characteristics were described across primary care models. The bivariable and multivariable associations between each potential predictor variable and provider-level and patient-level FCC were examined using linear mixed effects regression and logistic regression estimated using generalized estimating equations, respectively. All patient characteristics included in provider-level analyses and all provider characteristics included in patient-level analyses were aggregated at the practice level. Associations with all continuous predictor variables were modeled as linear.

Multivariable regression analyses were carried out to test whether the primary care model type was associated with FCC, after adjusting for patient and provider characteristics that were identified as potential confounders. Potential confounders were identified through testing of bivariable associations with both primary care model and FCC at a significance level of .20.[22,23] Variables identified as confounders were forced into the regression models. Pairwise comparisons between primary care models were made to identify significant differences. Tukey's method was used to adjust for multiple testing.

Multivariable regression analyses were also carried out to identify organizational characteristics associated with provider- and patient-level FCC. Stepwise backward elimination was used for this analysis. All variables significant at the 10% level were retained in the final regression model. Primary care model was specifically excluded as a predictor from these analyses in order to determine which organizational characteristics are associated with FCC irrespective of the primary care model type. Once the final regression equation was determined, primary care model was added as a covariate to determine if any residual effect remained after accounting for specific organizational characteristics.

Variables considered in the multivariable regression equations were centred on their overall means so that the intercept for the regression equation could be interpreted as the adjusted mean estimate for the average provider (or patient).[24] All analyses were performed using SAS, version 9.2.[25]

RESULTS

Participants

A total of 137 practices participated in the study (35 FFS practices, 35 CHCs, 35 FHNs, and 32 HSOs). The overall practice recruitment rate was 45% and was lowest among FFS practices (23%) (CHC=69%, HSO=49%, and FHN=37%). The sample of practices recruited was broadly representative of all Ontario family physicians in equivalent models for all demographic and billing parameters measured.[18] Within these practices, 363 providers and 5361 of their patients completed the surveys. All providers completed more than 50% of the FCC questions and were included in the analysis. A total of 217 patients (4%) were excluded for answering less than 50%

Table 1. Profile distribution characteristics, by model of primary care service delivery: *A) Practice characteristics; B) Provider characteristics; C) Patient characteristics.*

A)	MODEL OF PRIMARY CARE				
PRACTICE CHARACTERISTICS	CHC (N = 35)	FFS (N = 35)	FHN (N = 35)	HSO (N = 32)	*P* VALUE
Mean (SD) panel size*	1.3 (0.8)	1.8 (1.0)	1.5 (0.8)	2.0 (1.2)	.033
Mean (SD) no. of years practice has been operating	18.3 (7.6)	16.4 (9.3)	24.4 (10.6)	26.7 (9.5)	< .001
Mean (SD) no. of clinical services available on-site†	11.3 (2.0)	9.5 (2.6)	9.7 (2.9)	9.3 (2.3)	.0036
Mean (SD) no. of FTE family physicians	3.0 (1.1)	2.4 (1.8)	3.6 (3.3)	1.7 (1.2)	.0017
Mean (SD) no. of FTE nurse practitioners	2.5 (1.4)	0.1 (0.3)	0.3 (0.5)	0.2 (0.4)	< .001
Mean (SD) no. of FTE nurses‡	2.7 (1.9)	0.6 (1.0)	2.0 (2.1)	1.1 (0.9)	< .001
Mean (SD) no. of FTE nurses per family physician‡	0.9 (0.6)	0.2 (0.3)	0.6 (0.6)	0.7 (0.6)	< .001
Electronic medical records, n (%)	10 (29.4)	5 (14.7)	20 (58.8)	14 (45.2)	.0012
Group practices, n (%)	35 (100.0)	26 (74.3)	22 (62.9)	20 (62.5)	< .001
After-hours access,§ n (%)	31 (91.2)	19 (57.6)	22 (62.9)	22 (73.3)	.013
Mean (SD) rurality index	14.0 (18.9)	12.6 (17.6)	16.2 (18.7)	8.0 (9.2)	.234
B)	MODEL OF PRIMARY CARE				
PROVIDER CHARACTERISTICS	CHC (N = 182)	FFS (N = 58)	FHN (N = 81)	HSO (N = 42)	*P* VALUE
Mean (SD) no. of years since graduation	20.0 (9.9)	23.3 (8.9)	23.6 (9.2)	29.5 (9.6)	< .001‖
Mean (SD) minutes of booking interval for routine visits	24.8 (6.2)	12.9 (3.0)	13.9 (4.5)	13.6 (3.1)	< .001‖
Female sex, n (%)	131 (72.8)	26 (44.8)	33 (40.7)	11 (26.2)	< .001‖
C)	MODEL OF PRIMARY CARE				
PATIENT CHARACTERISTICS	CHC (N = 1155)	FFS (N = 1330)	FHN (N = 1442)	HSO (N = 1213)	*P* VALUE
Female sex, n (%)	839 (73.2)	887 (67.3)	942 (65.9)	729 (60.7)	< .001‖
White ethnicity, n (%)	884 (81.6)	1142 (88.4)	1357 (95.0)	1148 (95.2)	< .001‖
Education level > high school, n (%)	671 (60.6)	851 (66.0)	919 (65.5)	772 (65.4)	.18‖
Chronic condition, n (%)	840 (74.0)	956 (72.3)	1072 (75.6)	872 (72.5)	.46‖
Attending this practice for ≥ 5 y, n (%)	656 (57.7)	898 (69.3)	1055 (75.0)	1026 (86.9)	< .001‖
Household income > LICO,¶ n (%)	575 (66.2)	913 (87.4)	1023 (88.6)	849 (88.4)	< .001‖
Mean (SD) age, y	46.5 (16.9)	49.9 (16.4)	51.3 (16.5)	51.1 (17.2)	< .001‖
Mean (SD) no. of household members attending clinic	1.4 (1.5)	1.4 (1.4)	1.4 (1.4)	1.7 (1.5)	.028‖

CHC—community health centre, FFS—fee for service, FHN—family health network, FTE—full-time equivalent, HSO—health service organization, LICO—low-income cutoff.

*Panel size is the mean number of patients per FTE family physician (x 1000).

†Based on the question, "Which of the following services are available: nutrition counseling by a nutrition specialist or dietitian; family planning or birth control services; alcohol or drug abuse counseling or treatment (20-min sessions or longer); counseling for behavioural or mental health problems; suturing of minor lacerations; allergy shots; wart treatment; Papanicolaou tests; sigmoidoscopy; prenatal care; preparation for delivery and delivery (off-site) of babies; splinting for a sprained ankle; removal of an ingrown toenail; electrocardiograms; spirometry; or other?"

‡Refers to FTE nurses, registered practical nurses, and nursing assistants.

§Provision of services outside of regular office hours, over and above the Ontario Telephone Health Advisory Service.

‖*P* values adjusted for clustering of providers and patients by practice based on linear mixed regression and marginal logistic regression equations.

¶Low-income cutoff is a measure of household deprivation used by Statistics Canada.

of the FCC questions. Compared with those who were included, patients who were excluded were less likely to have been diagnosed with chronic diseases (58% vs 78%; $P<.001$) and less likely to have been with the practice for 5 or more years (57% vs 72%; $P<.001$).

Characteristics of the sample

Characteristics of participating practices, providers, and patients across the 4 primary care models are presented in **Table 1**. Provider-reported FCC scores ranged from 0.55 to 1.0. Overall, 57% of patients reported receiving FCC.

The following patient characteristics were identified as confounders: sex, annual household income, length of time attending the practice, and the number of family members attending the practice. The following provider characteristics were identified as confounders: sex and length of routine visit.

Comparison of primary care models

The results of the analyses comparing provider-reported FCC across the 4 primary care models are presented in **Table 2**. Community health centres had higher mean provider-reported FCC scores than all the other primary care models in the unadjusted analysis, but higher than only FHNs, after adjusting for patient and provider characteristics.

The results of the analyses comparing patient-reported FCC across the 4 primary care models are presented in **Table 3**. (Because no provider-level confounders were found to be significant in the equation, the results of that analysis are the same as those adjusted for patient-level confounders alone and are not shown). The percentage of patients who reported FCC in each primary care model ranged from 56% in HSOs to 59% in CHCs. The percentage of patients reporting FCC did not differ significantly by primary care model in either the unadjusted or adjusted analyses.

Organizational characteristics

Provider-reported FCC. The results of the analyses investigating organizational characteristics associated with provider-reported FCC are reported in **Table 4**. The number of clinical services available on-site, after-hours access, the number of nurse practitioners, and being a female provider were all positively associated with provider-reported FCC scores, while the number of full-time equivalent family physicians and the rurality index were negatively associated with provider-reported FCC. The proportion of female patients in a practice and the proportion of patients diagnosed with at least 1 chronic disease were positively associated with provider-reported FCC. When primary care model was added as a covariate, it was not significant but rendered the number of nurse practitioners non-significant (results not shown). This indicates that although there was no additional variability explained by the primary care model, model type and number of nurse practitioners might be related.

Table 3. Comparison of ORs of patient-reported FCC among models of primary care, adjusting for patient confounding factors

	ORs OF PATIENT-REPORTED FCC	
MODEL OF PRIMARY CARE	UNADJUSTED, OR (95% CI)	ADJUSTED (PATIENT*), OR (95% CI)
CHC	1.11 (0.88 to 1.40)	1.18 (0.90 to 1.54)
FFS	1.02 (0.82 to 1.28)	1.13 (0.88 to 1.46)
FHN	1.07 (0.86 to 1.34)	1.08 (0.85 to 1.39)
HSO	Reference	Reference

CHC—community health centre, FCC–family-centred care, FFS—fee for service, FHN—family health network, HSO–health service organization, OR—odds ratio.
*Adjusted for patient age, sex, educational attainment, annual household income, length of time attending the practice, and the number of family members attending the practice.

Table 2. Comparison of mean provider-reported FCC scores among models of primary care, adjusting for patient and provider confounding factors

	LEAST SQUARE MEAN ESTIMATES OF PROVIDER-REPORTED FCC, BY MODEL OF PRIMARY CARE SERVICE DELIVERY, CRUDE AND ADJUSTED ANALYSIS		
MODEL OF PRIMARY CARE	UNADJUSTED FCC ESTIMATE (95% CI)	ADJUSTED (PATIENT*) FCC ESTIMATE (95% CI)	ADJUSTED (PATIENT* AND PROVIDER†) FCC ESTIMATE (95% CI)
CHC	0.89 (0.87 to 0.91)‡	0.89 (0.87 to 0.91)§	0.89 (0.86 to 0.91)‖
FFS	0.84 (0.82 to 0.87)	0.84 (0.81 to 0.87)	0.84 (0.81 to 0.88)
FHN	0.82 (0.80 to 0.85)	0.82 (0.80 to 0.85)	0.83 (0.80 to 0.85)
HSO	0.83 (0.80 to 0.86)	0.83 (0.80 to 0.87)	0.84 (0.80 to 0.88)

CHC—community health centre, FCC–family-centred care, FFS—fee for service, FHN—family health network, HSO–health service organization.
*Adjusted for patient sex, annual household income, length of time attending the practice, and the number of family members attending the practice.
†Adjusted for provider sex and length of routine visit.
‡Significant pairwise comparisons with Tukey adjustment as follows (mean difference [95% CI]): CHC > FFS, 0.047 (0.015 to 0.079), $P=.024$; CHC > FHN, 0.066 (0.037 to 0.096), $P<.001$; CHC > HSO, 0.061 (0.026 to 0.095), $P=.004$.
§Significant pairwise comparisons with Tukey adjustment as follows (mean difference [95% CI]): CHC > FHN, 0.069 (0.029 to 0.108), $P=.004$.
‖Significant pairwise comparisons with Tukey adjustment as follows (mean difference [95% CI]): CHC > FHN, 0.061 (0.017 to 0.105), $P=.035$.

Patient-reported FCC. The results of the analyses investigating organizational characteristics associated with patient-reported FCC are reported in **Table 5**. Besides panel size, no other practice characteristics were found to be significantly associated with patient-reported FCC. For every 1000 additional patients in a practice, the odds of patient-reported FCC dropped by 8%. Four patient-level variables were associated with an increased odds of reporting FCC: attending the practice for 5 or more years (odds ratio [OR] = 1.46), having a chronic condition (OR = 1.37), having an annual household income below the low-income cut-off (OR = 1.28), and being female (OR = 1.23). When primary care model was introduced as a covariate (results not shown), it was not significantly associated with patient-reported FCC.

Table 4. Identifying organizational characteristics associated with provider-reported FCC: *Results of the reduced multivariable mixed regression model; intercept = 0.8059.*

	MULTIVARIABLE ASSOCIATION WITH PROVIDER-REPORTED FCC (OUTCOME OF PREDICTIVE MODEL)		
CHARACTERISTICS	β	95% CI	*P* VALUE
Practice characteristics			
• No. of clinical services available on site*	0.006	0.0008 to 0.011	.02
• After-hours access†	0.024	-0.003 to 0.052	.083
• Rurality index	-0.0008	-0.001 to -0.0002	.013
• FTE family physicians	-0.008	-0.013 to -0.002	.004
• FTE nurse practitioners	0.009	0.001 to 0.017	.03
Provider characteristics			
• Sex (female)	0.023	0.0016 to 0.045	.04
Patient characteristics (aggregated)			
• Sex‡	0.008	-0.001 to 0.018	.08
• Chronic condition§	0.014	0.003 to 0.025	.02

FCC—family-centred care, FTE—full-time equivalent.
*Based on the question, "Which of the following services are available: nutrition counseling by a nutrition specialist or dietitian; family planning or birth control services; alcohol or drug abuse counseling or treatment (20-min sessions or longer); counseling for behavioural or mental health problems; suturing of minor lacerations; allergy shots; wart treatment; Papanicolaou tests; sigmoidoscopy; prenatal care; preparation for delivery and delivery (off-site) of babies; splinting for a sprained ankle; removal of an ingrown toenail; electrocardiograms; spirometry; or other?"
†Provision of on-call services outside of regular office hours, over and above the Ontario Telephone Health Advisory Service.
‡A 10% increase in the proportion of female patients.
§A 10% increase in the proportion of patients who were ever diagnosed with a chronic disease.

Table 5. Identifying organizational characteristics associated with patient-reported FCC: *Results of the reduced marginal logistic regression model.*

	MULTIVARIABLE ASSOCIATION WITH PATIENT-REPORTED FCC (OUTCOME OF PREDICTIVE MODEL)		
CHARACTERISTICS	OR	95% CI	*P* VALUE
Practice characteristics			
• Panel size*	0.92	0.84 to 1.01	.095
Patient characteristics			
• Sex (female)	1.23	1.05 to 1.43	.010
• Age—quadratic	0.999	0.999 to 1.00	< .001
• Age—linear	1.01	1.01 to 1.02	< .001
• Chronic condition†	1.37	1.15 to 1.62	< .001
• Years attending practice (≥ 5 y)	1.46	1.23 to 1.73	< .001
• Household income (> LICO)	0.72	0.58 to 0.89	.003
• No. of family members attending clinic	1.14	1.08 to 1.20	< .001

FCC–family-centred care, FTE—full-time equivalent, LICO—low-income cutoff, OR—odds ratio.
*Panel size is the mean number of patients per FTE family physician (x 1000).
†Patients who were ever diagnosed with a chronic disease.

DISCUSSION

To our knowledge, this is the first study exploring practice organizational factors and FCC. While providers in CHCs reported higher FCC than those in FHNs did, this difference appears to be attributable to organizational characteristics. Practices that offered more clinical services and after-hours access, that had more nurse practitioners and fewer family physicians, and that were less rural had higher provider-reported FCC. These associations hold true within each primary care model and when adjusting for practice model type. The effect of nurse practitioners could not be evaluated separately in each model because there were too few nurse practitioners within the primary care models other than CHCs. This also likely accounts for the observation that the number of nurse practitioners and primary care model type were related. The higher FCC scores reported in practices with more nurse practitioners might be owing to a better establishment of the role of nurses in providing care to families.[26,27] Alternately, some of the processes of care assessed with the FCC instrument, such as assessing the health of other family members or social risk factors, might fall within the scope of practice of the nurse practitioner, resulting in higher scores for these practices. The negative effect of too many family physicians might be indicative of a broader trend, as larger teams have been found to have decreased accessibility[15] and continuity of care.[28]

Patient-reported FCC was high and did not differ across primary care models. Panel size was the only practice characteristic associated with patients reporting FCC in the adjusted analysis. When physicians care for too many patients, it might compromise their ability to provide FCC. The strongest predictors of patient-reported FCC were all at the patient level. This is in keeping with Jayasinghe and colleagues' findings[12] that the variation in reports of the related concept of patient-centred care was largely explained by patient characteristics, with minor influence from practice characteristics. Effects are largely consistent (but not statistically significant) across primary care models, suggesting that these factors influence FCC and that these were not a result of their association with a particular model.

Bamm and Rosenbaum stated that there had been no evidence to date of the effect of demographic characteristics on patient-reported FCC.[29] They speculated that patient age and sex might be relevant, as FCC was known to be related to patient satisfaction, and female patients and older patients tended to be more satisfied with care. Our findings support Bamm and Rosenbaum's speculation. We also identified relationships between socioeconomic factors and the odds of reporting FCC. Patients in the lowest economic brackets had nearly 30% greater odds of reporting FCC, suggesting that providers might focus on building relationships with more vulnerable patients. If patients reported ever having been diagnosed with a chronic condition or had been with their practice for 5 or more years, they had nearly 40% greater odds of reporting FCC. These results are not unexpected, as both characteristics indicate greater interaction between patient and provider and FCC is considered a dimension of the patient-provider relationship. Furthermore, patients excluded for not completing the FCC questions were less likely to have been diagnosed with a chronic condition or to have been with their practice this long, which might mean that this is an underestimate of the effect size of these variables. Overall, these findings indicate that demographic factors might be important when assessing patient reports of FCC. In particular, age, sex, number of family members attending a clinic, presence of a chronic condition, length of time with a practice, and economic factors should be taken into account in any future studies looking at patient assessments of FCC.

Limitations

Because we recruited patients from the waiting rooms, the sample is likely to overrepresent patients attending the practice more frequently. As we are interested in the care provided, including the perspectives of those patients who attend more often might be appropriate. However, if there is a relationship between FCC and practice attendance, this might create bias toward greater FCC reporting.

The patient FCC score was based on only 3 items and, consequently, did not have a smooth, normal-shaped distribution. Dichotomization likely affected our ability to detect an effect. A different tool, or perhaps an expanded version of the PCAT family-centredness scale, might offer better resolution for future research. Additional questions might be developed similar to those used in the PCAT provider FCC scale, such as discussions of family functioning and living conditions.[19] In particular, more attention should be paid to developing instruments that assess broader theoretical concepts of FCC, including building partnerships between providers and families, as well as understanding the perspectives and expertise that families bring to the therapeutic relationship.[28]

There are inherent limitations to cross-sectional studies, including the unknown temporal relationship between predictors and outcomes that precludes the inference of causation. As a consequence, despite finding a relationship or association between FCC and organizational characteristics, we cannot tell whether practice organizational characteristics cause more FCC or whether the provision of FCC leads a practice to implement a particular organizational characteristic or choose a certain model of service delivery.

Strengths

Broad geographic representation in the Ontario-wide sampling base makes results generalizable across the province, with the exception of the far northern areas that were not sampled.

The family-centredness scales were validated by Shi et al.[21] Because a standard, validated tool was used, the results of this study can be compared with those of other research.

Conclusion

Patients and primary care providers both report high levels of FCC. Primary care reform strategies that encourage physicians to care for more patients and work in larger practices might compromise the provision of FCC, while strategies that encourage multidisciplinary practices and a range of services might increase FCC.

As very little work has been done to date examining FCC in primary care, this study presents an important stepping stone. It highlights factors that might influence the provision of FCC. We hope our study informs the generation of research questions on this topic.

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Contributors

Ms Mayo-Bruinsma contributed to the analysis plan, performed all data analysis, and wrote the initial draft of the manuscript. **Dr Hogg** conceived the original study, provided consultation on the interpretation of results, critically reviewed and edited the manuscript, and approved the final version. **Dr Taljaard** consulted on the statistical analysis, critically reviewed and edited the manuscript, and approved the final version. **Dr Dahrouge** consulted on the statistical analysis, critically reviewed the manuscript, and approved the final version.

Competing interests

None declared

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