A B S T R A C T

The purpose of this paper was to identify factors associated with breastfeeding among mothers of children born in 1994 in five of the low income communities participating in the longitudinal prevention initiative "Better Beginnings, Better Futures." Household income was $\leq$ poverty line for 76%, 63% had completed high school or beyond, and 29% were born outside of Canada. The breastfeeding initiation rate was 77% (380 of 493). Of the 270 women who initiated breastfeeding and were interviewed up to five months postpartum, 63% continued for at least three months. Women with higher education, married, not experiencing financial stress and who attended prenatal classes were more likely to initiate breastfeeding. Continuation of breastfeeding was associated with older age, higher education, not smoking, and participation in a home visitor program. Breastfeeding promotion strategies should include ongoing support as well as education components.

A B R É G É

Cette étude avait pour objet de déterminer les facteurs associés à l'allaitement chez les mères d'enfants nés en 1994 dans cinq des communautés à faibles revenus participant à une initiative de prévention longitudinale intitulée «Better Beginnings, Better Futures». Le revenu familial était inférieur ou égal au seuil de la pauvreté pour 76 % d'entre elles, 63 % avaient terminé leurs études secondaires ou étaient allées plus loin, et 29 % étaient nées à l'étranger. Le taux d'allaitement initial s'élevait à 77 % (380 sur 493 mères). Sur les 270 femmes qui ont commencé à allaiter et qui ont été interviewées jusqu'à cinq mois après l'accouchement, 63 % ont continué d'allaiter leur bébé pendant trois mois au moins. Les femmes plus éduquées, mariées, ne connaissant aucun stress financier et qui avaient suivi les cours prénatals ont été celles qui avaient la plus grande probabilité de commencer à allaiter. La poursuite de l'allaitement est apparue associée à un âge plus avancé, à un niveau d'études plus élevé, à l'absence de tabagisme, et à la participation à un programme de visites à domicile. Les stratégies de promotion de l'allaitement doivent comprendre un soutien permanent ainsi qu'un volet éducatif.

Influences on Breastfeeding Rates in Low Income Communities in Ontario

Susan Evers, PhD,¹ Lori Doran, MSc,² Kathryn Schellenberg, PhD³

Despite extensive promotion of breastfeeding, compliance with the recommendations of the Canadian Paediatric Society^{1,2} has yet to be achieved. Low income women have consistently lower rates and consequently are the primary target of breastfeeding promotion activities. Among low income American women, 68% initiate breastfeeding.³ Rates for Canadian women across all income groups range from 43 to 83%.⁴⁻⁷ Early cessation of breastfeeding is prevalent; fewer than half of Canadian women who initiate breastfeeding continue to four months postpartum.⁴⁻⁶

An understanding of factors associated with initiation and continuation of breastfeeding is critical if activities to promote breastfeeding are to be successful. We examined this issue as part of the Better Beginnings, Better Futures project, a prevention initiative in economically disadvantaged communities in Ontario.⁸ Communities were selected based on a proposal submitted to the funding agencies documenting indicators of risk (such as the proportion of families living in subsidized housing, on social assistance, and unemployed) within a geographically

defined area. In the Better Beginnings project, the term "community" includes all residents living within these geographic boundaries. Steering committees consisting of community residents and agency partners were established to develop and implement prevention programs for children. Four communities have developed programs with children from birth to four years of age as their main focus; the remainder have developed programs for children between four and eight years of age. In communities with the prenatal through preschool focus, children born in 1994 are being followed until age four. At the time of the first interview, the main intervention was a home visitor program. To control for changes not related to the intervention, information is being collected in three additional communities that have similar demographic characteristics but are not receiving any funding for programs from the Better Beginnings, Better Futures project.

The choice of infant feeding method is related to attendance at prenatal classes,⁹⁻¹¹ income,^{4,6,11-13} maternal age,^{4,6,13,14} marital status,^{4,12,14,15} parity,^{14,15} and maternal education.^{4,6,13-15} Duration of breastfeeding is associated with maternal education,^{4,6,12-14} maternal age,⁴ support postpartum,^{16,17} cigarette smoking,^{4,18,19} and marital status.^{12,20} The influence of these factors has not been examined in a low income population in Canada. As well, this afforded an opportunity to assess the impact of participation in the home visitor program. Our objective was to identify factors associated with the decision to breastfeed initially, and to continue breastfeeding until three months postpartum, using data collected from the first interview.

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METHODS

The Better Beginnings Research Coordination Unit* designed the measurement plan, consulting with community representatives to ensure that the rationale was understood and that it was culturally appropriate. The protocol was approved by the tri-university (Queen's University, University of Guelph, Wilfrid Laurier University) Human Ethics Committee. The measurement plan includes a home interview with one parent covering demographic information, child care, parent and child interactions, family functioning, social contact, parental health, quality of the home and neighbourhood and use of services; mode of feeding and anthropometric status of the infant; and, measures of the infant's cognitive development.⁸ A pilot test of the interview and measures was conducted in each community. All research assistants underwent training on the administration of the measurement plan using a standardized protocol.

Subjects

Any family with a child born in 1994 within the geographical boundaries of the four Better Beginnings communities and one comparison community was eligible to participate. The primary recruitment strategy was daily telephone calls to local hospital maternity wards to identify potential subjects. Once a potential participant was identified, a public health nurse or social worker contacted the new mother to discuss the project and ask if a member of the research team could visit to explain the research component. A visit was arranged prior to the infant's three-month anniversary to explain the details of the study and obtain signed consent. We also recruited families who moved into each community with a child born in 1994 but older than three months because they would have access to the same community-based interventions during the four years of follow-up.

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TABLE I
Characteristics of Mothers (N=493)

Characteristics	n	%
Education		
Less than high school	183	37.1
High school	121	24.6
More than high school	189	38.3
Birthplace		
Canada	349	70.8
Vietnam	32	6.5
United Kingdom	9	2.8
China	8	1.6
Jamaica	8	1.6
Somalia	7	1.4
Other	80	6.1
Marital Status		
Lone parent	152	30.9
Partner	92	18.5
Married	248	50.4
Low Income†	373	76.3
Primiparous	188	38.1

† Household annual income below Statistics Canada's low income cutoff for 1993, based on family size and population of city of residence²¹

TABLE II
Characteristics of Mothers Who Initiated Breastfeeding or Formula Feeding

Characteristics	Breastfeeding (n=380)		Formula Feeding (n=113)	
	%	(n)	%	(n)
Attended prenatal class	44.5	(169)**	21.2	(24)
Education				
<High school	30.8	(117)**	58.4	(66)
High school	24.5	(93)	24.8	(28)
>High school	44.7	(170)	16.8	(19)
No financial stress†	73.4	(277)**	52.3	(58)
Primiparous	38.7	(147)	36.3	(41)
Low income‡	73.3	(277)*	85.7	(96)
Marital status				
Lone parent	27.2	(103)**	45.5	(48)
Partner	17.2	(65)	28.9	(27)
Married	55.6	(210)	33.6	(38)

† Respondents answered 'not true' to "sometimes we didn't have enough money for our food and living expenses."
‡ Based on Statistics Canada Low Income Cut-offs for 1993.²¹
* p<0.01, ** p<0.001

TABLE III
Factors Predictive of Decision to Breastfeed

Factors	B	Standard Error
Attended prenatal classes	0.97**	0.27
No financial stress†	0.63**	0.23
Education	0.58**	0.15
Marital status		
Lone parent vs partner	0.07	0.31
Married vs lone parent and partner	0.73**	0.26

† Respondents answered 'not true' to "sometimes we didn't have enough money for our food and living expenses."
* p<0.01, **p<0.001

Data collection

The interview took place within two weeks of the child's three-month anniversary for those identified at birth and for older infants, shortly after ini-

tial contact. Interviews were usually conducted in the family's home with the infant's primary caregiver. In communities where a number of families shared a language other than English, a

TABLE IV
Characteristics of Mothers Still Breastfeeding at Three Months and Those Who Stopped

Characteristics	Breastfeeding (n=169)		Stopped (n=101)	
	%	(n)	%	(n)
Attended prenatal class	48.5	(82)	49.5	(50)
Primiparous	33.7	(57)*	47.5	(48)
Education				
<High school	21.9	(37)**	46.5	(47)
High school	23.7	(40)	22.8	(23)
>High school	54.4	(92)	30.7	(31)
Participated in home visitor program	43.8	(74)	37.6	(38)
No financial stress†	72.7	(120)	76.2	(77)
Smokers	17.5	(27)**	45.5	(45)
Low income‡	73.1	(122)	78.0	(78)
Marital status				
Lone parent	23.7	(40)**	25.3	(25)
Partner	10.7	(18)	30.3	(30)
Married	65.7	(111)	44.4	(44)

† Respondents answered 'not true' to "sometimes we didn't have enough money for our food and living expenses."

‡ Based on Statistics Canada Low Income Cut-offs for 1993.²¹

* p<0.05, ** p<0.001

TABLE V
Factors Predictive of Continuation of Breastfeeding for Three Months

Factors	B	Standard Error
Mother's age	0.09**	0.02
Participated in home visitor program	0.53*	0.30
Smokers	-1.04**	0.31
Education	0.47**	0.18

* p<0.05 (one-tailed), ** p<0.01

research assistant fluent in the language and of the same cultural group was hired. The parent interview and consent forms were translated into the most common languages spoken. For families speaking other languages, interpreters were used with all data recorded by the researcher accompanying the interpreter.

For the present analyses we used the following information: maternal age, education, marital status and living arrangement, income, parity, smoking behaviour, prenatal class attendance, participation in a home visitor program, place of birth, financial stress ("have enough money to live on"); method of infant feeding at birth and at three months postpartum; reason(s) for choosing to breastfeed or formula feed at birth, and reason(s) for cessation of breastfeeding before three months.

The statistical package SPSSx (SPSSx Inc. Release 6.1, 1995, Chicago IL) was used for analysis. Associations were considered statistically significant at p<0.05.

RESULTS

We excluded 44 infants who weighed <2500 grams at birth, and infants for whom the respondent was the father (n=7) or the non-biological mother (n=9). The women ranged in age from 15 to 41 years with 12% ≤ 20 years. Over one third had less than a high school education, 76% had household incomes below the poverty line²¹ and 29% were born outside Canada (Table I).

Method of infant feeding at birth

At birth, 77% (n=380) of the women reported breastfeeding. The most common reason (75%) was that it was the 'healthiest' method. No single reason for choosing formula feeding predominated; 19% of the women were uncomfortable with or embarrassed by breastfeeding and 18% cited convenience.

We examined the effects of education, parity, age, income level, attendance at prenatal classes, marital status and financial stress on initiation of breastfeeding. There

was no difference in the mean age of women who breastfed (26.9±6.7 years) and those feeding formula (26.7±5.6). Of the five variables associated with feeding method (Table II), all but income level were identified as predictors after a series of logistic regression models. Women who attended prenatal classes, had higher levels of education, were married and were not experiencing financial stress were more likely to initiate breastfeeding (Table III).

Infant feeding practices at three months

We restricted the analysis of factors associated with continuation of breastfeeding for three months to families whose child was <6 months at the time of the interview, to minimize error in recalling when the infant was weaned. Of the 270 mothers who initiated breastfeeding and were interviewed between three and five months postpartum, 63% (n=169) breastfed for at least three months. The main reasons for stopping breastfeeding prior to three months were "not enough milk" (13%), "baby rejected it" (13%), and "baby seemed hungry" (10%).

Parity, prenatal class attendance, age, education, participation in the home visitor program, smoking, income level, financial stress, and marital status were tested for association with continuation of breastfeeding for three months (Table IV). Women who had stopped were younger (25.2±5.7 years) compared to those still breastfeeding (28.3±4.8) (t=-4.87, p<0.001). In the final logistic regression model, women who were older, non-smokers, with higher level of education, and participated in a home visitor program were more likely to breastfeed to three months postpartum (Table V).

DISCUSSION

The breastfeeding initiation rate was 77%, comparable to the 1990 Ontario Health Survey,⁴ suggesting that rates have improved among low income women. The most frequently cited reason for breastfeeding was 'healthiest/best nutrition'. Many women opted to use formula because they were 'uncomfortable with breastfeeding'. Women who choose to formula feed generally acknowledge the health benefits of

breastfeeding;²² therefore, it may be more important to increase the amount of practical information provided to women than to emphasize further the health benefits associated with breastfeeding. Early cessation of breastfeeding is prevalent; by three months one third of the women had stopped. The most common reasons for weaning were related to perceived milk insufficiency. Although the women in this study were at high risk of energy and nutrient inadequacies,²³ it is doubtful that either the quality or quantity of milk was adversely affected.²⁴

Our findings indicate that maternal education, maternal age, and smoking influence feeding decisions regardless of income level. Among low income women in this study, however, perceived financial stress was a more important predictor of infant feeding practices at birth than actual income.^{6,13}

Breastfeeding initiation rates for women living with a partner (71%) were comparable to those who were lone parents (68%). Freed et al.²⁵ reported that spouses of women who planned to breastfeed were more likely to believe that breastfeeding was best for the infant, than those who reported that their spouse planned to formula feed. The method of infant feeding preferred by the father influences decisions on both initiation²⁶ and duration²⁰ of breastfeeding.

Only 31% of women living with a partner continued breastfeeding to three months, compared to 62% and 72% for lone parent and married women, respectively. The decision by women living with a partner to wean the infant early may be related to the pressure of other responsibilities and/or a lack of support. The negative influence of a partner on breastfeeding has also been noted among low income American women.²⁵ Fathers need education on breastfeeding in order to provide support for mothers.^{26,27} Are partners less likely to attend prenatal education programs? We did not evaluate the partner's attitude toward breastfeeding or their attendance at prenatal programs, but participation by women and their partners has been associated with longer breastfeeding.¹⁷

Most prenatal programs emphasize knowledge and skills about pregnancy and

birth, encouraging breastfeeding and proper nutrition;²² few offer support postpartum. Fortunately, this gap has been recognized and the Canada Prenatal Nutrition Program includes continued support for women for six months after birth. Home support in addition to group support¹⁶ is associated with longer breastfeeding duration. The home visitor program developed for Better Beginnings, Better Futures, is adapted for paraprofessionals from the home visitation program described by Olds²⁸ using nurses. The program was not designed to assist new mothers with breastfeeding but rather to assist with the numerous stressful situations confronting low income parents. Home visitors help solve problems with housing, child care, health care, transportation and parenting. Home visitors live in the community and are familiar with the language and cultures of the residents. The positive influence of participation in the home visitor program on breastfeeding duration suggests that the availability of support for other areas of family life may allow new mothers to concentrate on breastfeeding by reducing other demands on her time. With recent reductions in the length of obstetrical stays to 24 to 48 hours, new mothers are discharged before breastfeeding is established, increasing the likelihood of unsuccessful lactation unless the mother has support readily available.

CONCLUSION

The breastfeeding initiation rate observed in this study is among the highest documented for low income women, but still less than optimal. Early cessation is prevalent, with fewer than two thirds continuing for three months. Low income women who are successful in breastfeeding possess characteristics similar to their more affluent counterparts; they are older, better educated, and more likely to attend prenatal classes.

Efforts to promote breastfeeding must incorporate strategies to address factors that impede a woman's decision to breastfeed or to continue for the recommended duration. Early management of breastfeeding has a strong influence on its success, therefore, breastfeeding guidance should be

offered immediately after birth and up to six months postpartum. As well, some of the reasons given for choosing to formula feed or wean the infant before three months are based on misinformation and indicate a need for knowledge about breastfeeding, particularly practical information. Fathers should participate in both prenatal and breastfeeding programs to ensure support for the mother. Furthermore, additional support through a home visitor program has a positive effect on breastfeeding duration and should be a component of breastfeeding promotion strategies.

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