

Extreme attitudes to body shape, social and psychological factors and a reluctance to breast feed

J Barnes PhD¹ A Stein FRCPsych¹ T Smith BA¹ J I Pollock PhD² ALSPAC Study Team²

J R Soc Med 1997;90:551-559

SUMMARY

Despite widespread advocacy of breast feeding, many babies are breast fed only briefly, if at all. Mothers' decisions on how to feed are often made before the birth; so we have sought demographic, social and psychological factors that might be amenable to intervention during pregnancy.

In the Avon Longitudinal Study of Pregnancy and Childhood about 12 000 women completed questionnaires in pregnancy. Univariate analyses were carried out to establish which factors were related to breast feeding intentions. All significant factors in univariate analyses were entered into logistic regression analyses.

Demographic characteristics independently related to intentions to breast feed included older maternal age, more maternal education, primiparity and not smoking; in previous work all these had been associated with actual feeding behaviour. Social relationship variables had a small influence. Of the psychological variables, a notable finding was that women who were preoccupied with their body shape and those who expressed controlling, less child-centred, responses to managing an infant in the postnatal months were less likely to express intentions to breast feed. Depression did not predict breast feeding intentions once the other factors had been taken into account.

Health care professionals may be able to intervene to increase breast feeding by making routine enquiries during antenatal care and targeting appropriate subgroups.

INTRODUCTION

For most infants, breast milk has substantial advantages over substitutes¹. From a physical point of view, it offers short-term protection against both gastrointestinal disease² and lower respiratory tract illness³. Moreover, breast-fed children seem to do better in terms of intellectual development. For example, Pollock⁴ found that children scored higher on vocabulary tests and other measures of cognitive function (British Ability Scales) at 5 and 10 years of age, respectively, if they were exclusively breast fed for three or more months. Lucas and colleagues in Cambridge found that low-birth-weight children who received breast milk had higher functioning on the Wechsler Intelligence Scale at age 7-8 than those who received formula milk^{5,6}; and neurological advantages of breast feeding have been identified in 9-year-old children⁷.

Despite widespread advocacy of breast feeding in primary care, many women breast feed for a very short time and a substantial proportion do not breast feed at all⁸. If rates of breast feeding are to be improved then different or additional intervention strategies may be needed before birth. To this

end those factors amenable to intervention should be targeted antenatally so that breast feeding can be promoted among those women unsure what course to take or those who have decided upon bottle-feeding. This approach has validity because stated prenatal intentions about infant feeding are highly related to actual feeding practice⁹.

Several variables related to social and educational disadvantage consistently predict feeding methods¹⁰ but as yet they have not been confirmed as predictors of mothers' infant feeding plans. Other factors relevant to parenting have received little attention, notably, psychological characteristics such as parental attitudes to control and maternal concerns about body shape.

The latter may be important since mothers with eating disorders have a high prevalence of poorly growing children¹¹⁻¹³. With respect to psychiatric morbidity, Stein *et al.*⁹ found in their prospective study that maternal morbidity was associated with an intention not to breast feed, while their follow-up¹⁴ indicated that depression *per se* was associated with giving up breast feeding. A similar association was found by Alder and Cox¹⁵ but whether the relation is causal remains unresolved. With respect to extreme body shape concerns, there is reason to believe that they may influence breast feeding intentions and practice¹⁶. In addition, women with eating disorders are more likely than controls to be involved during mealtimes in conflictual

¹Leopold Muller University Department of Child and Family Mental Health, Royal Free Hospital School of Medicine, London NW3 2PF; ²Division of Paediatric & Perinatal Epidemiology, Institute of Child Health, University of Bristol, 24 Tyndall Avenue, Bristol BS8 1TQ, UK

Correspondence to: Dr J Barnes

interactions with their one-year-olds about food-related incidents¹³. Little is known about the influence of eating disorders on mother-child feeding interactions before weaning.

Parental belief in an authoritative style of child-rearing—firm but child-centred—has been associated with optimal child outcomes in early childhood^{17–19}. Attitudes to child rearing, and to feeding practices in particular, may affect parents' breast feeding intentions although this has not been studied. There is an urgent need to examine such attitudes, particularly parents' attitudes to control over the infant feeding situation and the extent to which they believe a baby's hunger should be satisfied on demand or only in the context of a routine. Issues surrounding control and conflict over infant autonomy have emerged as predictors of poor child outcomes for mothers with bulimia nervosa (Stein A, Woolley H, unpublished).

We have used data from the Avon Longitudinal Study of Pregnancy and Childbirth (ALSPAC) to examine a wide range of social and psychological factors which might impact on breast feeding intentions. Our first aim was to determine whether factors known to be related to actual feeding behaviour applied to prenatally expressed feeding intentions. Secondly, taking account of such influences, we wanted to investigate the relevance of the psychological factors mentioned above to prenatal reluctance to breast feed. The ultimate aim was to identify factors that might be amenable to antenatal intervention, so as to increase rates of breast feeding.

METHODS

ALSPAC, also known as the Children of the Nineties project, recruited all women resident in the three Bristol-based health districts of Avon who had an expected delivery date between 1 April 1991 and 31 December 1992. Enrolment followed widespread publicity and contact by midwives interviewing women at their booking visit. Women who left the study area shortly after enrolment were omitted from follow-up, but those who completed the questionnaire schedule for the third trimester of pregnancy before leaving were kept in the study. The numbers giving complete information on each relevant question under consideration in this paper are shown in Tables 1–3.

Four questionnaires administered during pregnancy provide the data for this paper—'Your Environment', sent immediately after enrolment; 'Having a Baby', at 18 weeks' gestation; 'Your Pregnancy', at 32 weeks' gestation; and 'About Yourself', which could be completed at any time during pregnancy.

Outcomes: breast feeding intentions

Respondents were asked at 32 weeks 'How are you going to feed your baby (a) in the first week? (b) in the first month?

and (c) in the next three months?' Responses to questions (a) and (c) are reported. Generally results of analyses concerned with feeding in the first month were very similar to those about the first week. Each question had a four-choice response scale: breast; bottle; breast and bottle; and uncertain. Examination of the univariate data using a three-point scale (breast or breast and bottle; uncertain; definitely bottle) showed no significant differences between the 'definitely bottle' and 'uncertain' groups in the major psychological variables included in the study. The only demographic difference was that slightly more of the 'uncertain' group were first-time mothers. Thus, since the principal question concerned women who had not definitely decided to breast feed, responses to intentions to breast feed questions were re-coded into a dichotomous intent-to-breast-feed variable: Yes='definitely breast feeding' or 'breast and bottle feeding'; No='definitely bottle feeding' or 'uncertain'.

Predictors

Demographic characteristics

The sample was described in terms of maternal age at 18 weeks' gestation; highest maternal and paternal educational qualifications; housing status (owner-occupier, renting privately, renting from council), and presence of living biological children. Data were also included on maternal smoking habits and whether the mother-to-be had been breast fed as a child.

Psychological characteristics

Included in 'Having a Baby' at 18 weeks was the Edinburgh Post-Natal Depression Scale (EPDS)²⁰—a 10-item self-report screening instrument originally designed to detect depression in the post-natal period. However, its exclusion of somatic items makes it particularly suitable for indicating depression in pregnancy and it has been used in other studies of pregnancy women²¹. A four-choice response for each item (often; sometimes; hardly ever; not at all) is converted to scores of 3, 2, 1 or 0 with a maximum possible of 30 points. A cut-point of 13 or greater is used to identify depression²⁰.

At 32 weeks the 'Your Pregnancy' questionnaire asked selected items from the Eating Disorder Examination Questionnaire (EDE-Q)²² about eating and weight concerns in the previous 28 days. Included were five of the nine items comprising the EDE-Q 'Shape Concern' subscale, and five of the six EDE-Q 'Weight Concern' items. In a sample of women already identified as having eating problems²³, it was established that scores from the reduced subscales correlated significantly with the full subscale scores (weight 0.99; shape 0.98). Each item has a three-point scale and each subscale score is the mean of

Table 1 Univariate analyses of demographic factors and breast feeding intentions

Parental characteristic	Feeding intentions for one-week-old infant			Feeding intentions for infant up to four months		
	n	Intend to breast feed (%)	Relative odds (95% confidence interval)	n	Intend to breast feed (%)	Relative odds (95% confidence interval)
All cases	11907	77		11856	58	
Maternal age (years)						
19 and under	508	59	1.00	505	34	1.00
20-24	2198	66	1.37 (1.12, 1.67)	2187	46	1.65 (1.35, 2.02)
25-29	4677	78	2.46 (2.03, 2.97)	4648	58	2.71 (2.23, 3.29)
30-34	3128	84	3.79 (3.10, 4.64)	3124	69	4.30 (3.52, 5.25)
35+	1035	87	4.62 (3.59, 5.95)	1033	73	5.33 (4.23, 6.70)
			χ^2 399.4, 4df, $P < 0.00001$			χ^2 409.6, 4df, $P < 0.00001$
Maternal educational qualifications						
None/CSE	3562	61	1.00	3562	41	1.00
O level	4096	77	2.09 (1.90, 2.31)	4067	55	1.72 (1.57, 1.88)
A level	4187	91	6.52 (5.75, 7.40)	4163	77	4.79 (4.35, 5.29)
			χ^2 981.7, 2df, $P < 0.00001$			χ^2 1055.6, 2df, $P < 0.00001$
Paternal educational qualifications						
None/CSE	3953	65	1.00	3939	44	1.00
O level	2404	77	1.80 (1.61, 2.13)	2387	58	1.75 (1.57, 1.93)
A level	5041	87	3.66 (3.29, 4.06)	5019	71	3.05 (2.80, 3.33)
			χ^2 614.7, 2df, $P < 0.00001$			χ^2 642.3, 2df, $P < 0.00001$
Maternal parity						
One or more children	6331	72	1.00	6334	55	1.00
No children	5131	84	1.95 (1.77, 2.13)	5079	63	1.40 (1.30, 1.51)
			χ^2 202.5, 1df, $P < 0.00001$			χ^2 76.2, 1df, $P < 0.00001$
Maternal smoking						
15+ per day	669	59	1.00	665	37	1.00
1-14 per day	1484	66	1.38 (1.14, 1.66)	1474	47	1.48 (1.23, 1.79)
None	9505	81	2.89 (2.46, 3.40)	9468	62	2.78 (2.36, 3.27)
			χ^2 289.8, 2df, $P < 0.00001$			χ^2 261.6, 2df, $P < 0.00001$
How mother was fed						
Not breast fed	4204	67	1.00	4192	49	1.00
Don't know	1844	72	1.26 (1.12, 1.42)	1833	48	0.97 (0.87, 1.08)
Breast fed	5711	86	2.96 (2.68, 3.27)	5684	69	2.24 (2.06, 2.43)
			χ^2 506.4, 2df, $P < 0.00001$			χ^2 457.1, 2df, $P < 0.00001$

five items (minimum 1.0, maximum 3.0). A cut-off point of 2.0 or more was selected to indicate marked shape or weight concern.

Social relationships

Six questions in the 'About Yourself' questionnaire, asking about affection between the respondent and her partner, give a 'partner affection' score (maximum 30, minimum 6); a high score denotes less affection and less mutual exchange about feelings, derived from questions such as 'does your partner listen to you when you want to talk about your

feelings?' A 'social network' score was created from ten items on frequency of meetings with family and friends and a 'social support' score from ten items asking about perceived support from family and friends. The 'social network' scale included practical aspects of support such as borrowing money in an emergency while 'social support' covered feelings about support or its absence.

Parental attitudes

The 'Your Pregnancy' questionnaire, given at 32 weeks gestation, included a number of statements about child-

Table 2 Univariate analyses of categorical psychological, social and parental attitude factors and intentions to breast feed

Parental characteristic	Feeding intentions for one-week-old infant			Feeding intentions for infant up to 4 months		
	n	Intend to breast feed (%)	Relative odds (95% confidence interval)	n	Intend to breast feed (%)	Relative odds (95% confidence interval)
Shape concern diagnosis						
At or above cut-off	2560	75	1.00	2553	54	1.00
Below cut-off	8342	78	1.22 (1.10, 1.35)	8305	61	1.30 (1.19, 1.42)
			χ^2 14.0, 1df, $P < 0.0002$			χ^2 33.6, 1df, $P < 0.00001$
Weight concern diagnosis						
At or above cut-off	1851	75	1.00	1852	54	1.00
Below cut-off	9052	78	1.20 (1.07, 1.35)	9010	60	1.26 (1.14, 1.40)
			χ^2 9.5, 1df, $P < 0.002$			χ^2 20.8, 1df, $P < 0.00001$
Edinburgh Post-Natal Depression Scale						
At or above cut-off	1436	72	1.00	1426	52	1.00
Below cut-off	9473	78	1.37 (1.21, 1.56)	9438	60	1.41 (1.26, 1.58)
			χ^2 24.7, 1df, $P < 0.00001$			χ^2 36.4, 1df, $P < 0.00001$
Should pick up crying baby						
Disagree	3970	70	1.00	3953	51	1.00
Probably disagree	2085	77	1.46 (1.29, 1.66)	2072	56	1.20 (1.08, 1.33)
Probably agree	3126	81	1.85 (1.65, 2.07)	3107	63	1.59 (1.45, 1.75)
Agree	2546	82	1.95 (1.72, 2.20)	2538	67	1.95 (1.76, 2.16)
			χ^2 174.1, 3df, $P < 0.00001$			χ^2 193.2, 3df, $P < 0.00001$
'Regular feeding and sleep is important'						
Agree	8418	75	1.00	8377	56	1.00
Possibly agree	2210	83	1.64 (1.45, 1.85)	2198	64	1.41 (1.28, 1.55)
Possibly disagree	601	84	1.77 (1.42, 2.22)	601	69	1.78 (1.49, 2.13)
Disagree	546	80	1.34 (1.08, 1.66)	546	68	1.71 (1.42, 2.05)
			χ^2 86.6, 3df, $P < 0.00001$			χ^2 102.5, 3df, $P < 0.00001$
'Should always feed a hungry baby'						
Disagree	272	56	1.00	273	38	1.00
Probably disagree	432	66	1.49 (1.09, 2.04)	426	42	1.18 (0.86, 1.61)
Probably agree	2314	74	2.21 (1.71, 2.86)	2314	51	1.68 (1.30, 2.18)
Agree	8768	79	2.94 (2.30, 3.75)	8736	62	2.64 (2.06, 3.38)
			χ^2 130.1, 3df, $P < 0.00001$			χ^2 190.4, 3df, $P < 0.00001$
'Parents should adapt life for baby'						
Agree	3007	81	1.00	2988	64	1.00
Probably agree	2981	81	0.99 (0.87, 1.13)	2971	61	0.87 (0.79, 0.97)
Probably disagree	2353	77	0.81 (0.71, 0.92)	2338	56	0.72 (0.64, 0.80)
Disagree	3313	71	0.59 (0.52, 0.66)	3308	52	0.61 (0.55, 0.68)
			χ^2 109.9, 3df, $P < 0.00001$			χ^2 105.2, 3df, $P < 0.00001$

Table 3 Univariate analyses of non-categorical psychological and social factors and intentions to breast feed

Factor	Feeding intentions for one-week old infant				Feeding intentions for infant up to 4 months			
	n	Mean (SD)	T value	P	n	Mean (SD)	T value	P
Partner affection score								
Not breast feed	2363	12.10 (4.41)			4347	11.86 (4.27)		
Breast feed	8436	11.18 (4.04)	9.55	<0.0001	6407	11.04 (4.02)	10.05	<0.0001
Social network score								
Not breast feed	2548	22.54 (4.16)			4487	22.80 (4.07)		
Breast feed	8576	23.58 (3.71)	-11.84	<0.0001	6500	23.70 (3.64)	-12.11	<0.0001
Social support score								
Not breast feed	2273	18.97 (5.31)			4206	19.16 (5.18)		
Breast feed	8221	19.87 (4.92)	-7.54	<0.0001	6225	20.04 (4.87)	-8.84	<0.0001

rearing (e.g. babies should be picked up whenever they cry) each of which had a four-point response scale. Four items dealing with responsiveness to child needs were included in the analyses.

Analysis

The aim of the analysis was to examine psychosocial factors influencing intentions to breast feed in the first week after birth and during the next four months, controlling for background demographic data. Univariate effects of each factor were analysed by chi-square for categorical variables and by t-tests for continuous variables. To examine which factors had an independent influence on breast feeding intentions, multivariate analyses were conducted with the logistic regression program from SPSS 6.1 for Windows²⁴, suitable for estimating influences on a binary outcome variable. Forward stepwise selection was used, with removal based on the probability of the Wald statistic.

The univariate analyses reflect the numbers of women who gave complete information for each relevant item and for feeding intentions (see Tables 1-3) and the regression analysis includes only those women with complete information on all relevant items (Table 4).

RESULTS

Univariate analyses

Parental characteristics

Breast feeding intentions increased with maternal age, with maternal and paternal educational level, and if the mother herself had been breast fed. Intention to breast feed was less likely if there were other children in the family or if the mother smoked (see Table 1). Breast feeding intentions were unrelated to housing status.

Psychological characteristics

Placement above the cut-off point on the Edinburgh Post-Natal Depression Scale and concern about shape and weight on the eating disorder questionnaire were significantly and negatively related to breast feeding intentions (see Table 2).

Parental attitudes

Those women who agreed with child-centred responses such as always picking up a crying baby and always feeding a hungry baby were more likely to report intentions to breast feed at one week and four months than those who responded in an adult-centred manner (see Table 2).

Social relationships

Women intending to breast feed had higher social network scores and higher levels of social support than those who intended to bottle feed or were still uncertain. They also had lower 'partner affection' scores (see Table 3).

Multivariate analysis

Full information on all the variables entered into the logistic regression were available for 71% of the women who had expressed breast feeding intentions (intention for first week, n=8431; intention for four months n=8392), Comparison of the regression sample with the whole sample answering the feeding intentions question (first week, n=11907; four months, n=11856) showed a higher mean age and educational level for those with complete information. Table 4 shows the factors found by use of forward stepwise logistic regression to be independently associated with breast feeding once other factors were taken into account. The relative odds of intending to breast feed are given for categorical variables. The final prediction accuracy for feeding intentions at one week is 80.4% (χ^2

Table 4 Results of forward stepwise logistic regression to predict intentions to breast feed

	Feeding in first week		Feeding up to four months	
	<i>n</i>	Relative odds of breast feeding (95% confidence interval)	<i>n</i>	Relative odds of breast feeding (95% confidence interval)
Parental characteristics				
Maternal age				
19 and under	243	1.00 –	244	1.00 –
20–24	1430	1.42 (1.04, 1.92)	1423	1.45 (1.08, 1.95)
25–29	3556	1.99 (1.47, 2.68)	3528	1.79 (1.34, 2.40)
30–34	2433	2.50 (1.82, 3.43)	2432	2.36 (1.74, 3.19)
35 and over	769	2.70 (1.86, 3.92)	765	2.75 (1.96, 3.85)
Wald (4 df)		59.11 <i>P</i> <0.00001		69.47 <i>P</i> <0.00001
Maternal educational qualifications				
None, CSE or vocational	2047	1.00 –	2046	1.00 –
O level	3073	1.53 (1.33, 1.75)	3054	1.30 (1.15, 1.48)
A level	3311	3.23 (2.71, 3.89)	3292	2.59 (2.25, 2.98)
Wald (2 df)		169.69 <i>P</i> <0.00001		199.64 <i>P</i> <0.00001
Paternal educational qualifications				
None, CSE or vocational	2547	1.00 –	2538	1.00 –
O level	1855	1.16 (1.01, 1.35)	1842	1.34 (1.17, 1.53)
A level	4029	1.58 (1.36, 1.83)	4012	1.53 (1.35, 1.73)
Wald (2 df)		38.23 <i>P</i> <0.00001		47.64 <i>P</i> <0.00001
Maternal parity				
One or more children	4666	1.00 –	4568	1.00 –
No children	3765	2.18 (1.91, 2.50)	3734	1.57 (1.46, 1.75)
Wald (1 df)		128.19 <i>P</i> <0.00001		64.24 <i>P</i> <0.00001
Maternal smoking				
15+ cigarettes per day	427	1.00 –	423	1.00 –
1–14 cigarettes per day	990	1.39 (1.08, 1.80)	989	1.61 (1.25, 2.08)
Non-smoker	7014	1.80 (1.44, 2.25)	6980	1.91 (1.52, 2.38)
Wald (2 df)		31.94 <i>P</i> <0.00001		34.55 <i>P</i> <0.00001
How mother was fed as a baby				
Not breast fed	2995	1.00 –	2986	1.00 –
Don't know	1204	1.52 (1.28, 1.80)	1196	1.04 (0.90, 1.21)
Breast fed	4232	2.49 (2.18, 2.82)	4210	1.89 (1.70, 2.10)
Wald (2 df)		189.73 <i>P</i> <0.00001		159.86 <i>P</i> <0.00001
Psychological and social factors				
Shape concern diagnosis				
2.0 and over	2004	1.00 –	1993	1.00 –
Below 2.0	6427	1.25 (1.09, 1.42)	6399	1.26 (1.13, 1.42)
Wald (1 df)		10.62 <i>P</i> <0.001		16.82 <i>P</i> <0.00001
Weight concern diagnosis				
2.0 and over	1418	ns	1417	1.00 –
Below 2.0	7019	ns	6891	1.16 (1.02, 1.32)
Wald (1 df)		Not selected		5.44 <i>P</i> <0.02
Social network				
Wald (1 df)		4.11 <i>P</i> <0.05		9.58 <i>P</i> <0.002

Table 4 continued overleaf

Table 4 (continued)

	Feeding in first week		Feeding up to four months	
	n	Relative odds of breast feeding (95% confidence interval)	n	Relative odds of breast feeding (95% confidence interval)
Partner affection				
Wald (1 df)		Not selected		7.04 $P < 0.01$
Maternal attitudes				
'Should pick up crying baby'				
Disagree	2748	1.00 -	2737	1.00 -
Probably disagree	1520	1.25 (0.92, 1.31)	1510	0.98 (0.84, 1.31)
Probably agree	2304	1.27 (1.08, 1.49)	2291	1.19 (1.04, 1.35)
Agree	1859	1.10 (1.06, 1.48)	1854	1.34 (1.17, 1.54)
Wald (3 df)		11.25 $P < 0.01$		24.05 $P < 0.00001$
'Regular feed and sleep important'				
Agree	5934	1.00 -	5906	1.00 -
Probably agree	1661	1.28 (1.09, 1.51)	1654	1.19 (1.05, 1.27)
Probably disagree	455	1.35 (1.01, 1.83)	453	1.41 (1.12, 1.77)
Disagree	381	1.50 (1.09, 2.01)	379	1.66 (1.29, 2.25)
Wald (3 df)		16.63 $P < 0.001$		27.09 $P < 0.00001$
'Should always feed hungry baby'				
Disagree	177	1.00 -	179	1.00 -
Probably disagree	303	1.04 (0.68, 1.59)	299	1.03 (0.68, 1.55)
Probably agree	1670	1.37 (0.96, 1.97)	1661	1.22 (0.87, 1.72)
Agree	6281	2.14 (1.52, 3.01)	6253	2.02 (1.44, 2.80)
Wald (3 df)		63.86 $P < 0.00001$		89.46 $P < 0.00001$
'Should adapt life to baby'				
Agree	2166	1.00		
Probably agree	2213	0.95 (0.80, 1.14)		
Probably disagree	1711	0.86 (0.72, 1.04)		
Disagree	2341	0.80 (0.68, 0.94)		
Wald (3 df)		8.68 $P < 0.05$		Not selected

Variables not selected at either time: Social support score; Edinburgh Post-Natal Depression Scale diagnosis
ns=not significant

1351.3, $P < 0.00001$), and 69.2% (χ^2 1442.2, $P < 0.00001$) for intentions up to four months.

All the parental characteristics continued to exert an influence on the breast feeding intention outcomes. Maternal age was related to breast feeding primarily in terms of the mothers of 30 or above, who were more than twice as likely to have breast feeding plans than younger mothers. Maternal education was a powerful predictor for both time points and a higher level of partners' education also increased the odds of breast feeding intentions. Smoking maintained a significant negative influence, while a woman who knew she had herself been breast fed was more likely to intend breast feeding her infant. Women

expecting their first child were more likely to plan breast feeding than those who already had a child.

Of the psychological attributes, depression was not a significant predictor of breast feeding intentions once other variables had been taken into account but concern over body image maintained a significant effect. The relative odds of intending to breast feed during the infant's first week was 1.25 times higher for women who had no concern over their body image than for women who had marked concerns about their body shape. The effect was still evident in relation to breast feeding intentions up to four months after childbirth. Weight concern had a small but significant effect at four months, but not on intentions in the first week.

The parental attitude questions were also found predictive of breast feeding intentions. For example, women who agreed that one should always pick up a crying baby were more likely to endorse plans for breast feeding up to four months than those disagreeing, while those who agreed that a regular routine was important were less likely to intend breast feeding. Two of the social relationship variables (partner affection and social network) had a minor but significant effect on intentions to breast feed at four months once other predictors were taken into account (see Table 4).

DISCUSSION

The most powerful predictors of breast feeding intentions in this community sample, as with previous work on actual breast feeding behaviour, were parental characteristics—maternal age, maternal and paternal education, parity, and maternal smoking. The knowledge that maternal characteristics are major predictors of mothers' plans before their children's birth allows for confidence in targeting of specific groups, such as women in their teens who are expecting a baby, those who already have a baby, those with few educational qualifications, and those who smoke. Such women are already given considerable information and support postnatally about child care and parenting, including social support and didactic materials extolling the positive effects of breast feeding on the infant. The findings of the current study suggest that the effort to increase breast feeding rates may usefully be directed to expectant mothers rather than to those attending child health clinics once their infants have been born.

The results of this study also point to the possibility of identifying women who may benefit from more, or different types of, intervention. Several psychological maternal characteristics proved to have a significant independent effect on breast feeding intentions even when the powerful demographic variables were controlled for. This suggests that a small but important group of women may benefit from interventions other than the strictly educational—i.e. incorporating psychological strategies. Two such factors were identified as independent predictors of breast feeding intentions.

First, women who were particularly concerned about their own body shape were less likely to express an intention to breast feed. Extreme body shape concerns are a central part of eating disorder psychopathology. There is an accumulating body of evidence that eating disorders are amenable to treatment, especially by cognitive therapy directed at factors such as body shape concerns. Furthermore, there is evidence that an eating disorder in a mother has an impact on the relationship between mother and infant and on the infant's

development¹³. Extreme body shape concern has been identified as one of the factors that predict poor outcomes in the infant¹³. While we do not suggest that pregnancy is the best time to treat previously undiagnosed eating problems, these women may benefit from additional support in relation to child-care plans. In view of the evidence from this study that women with extreme body shape concerns are less likely to want to breast feed, and that these concerns are related to poor infant outcomes, interventions targeting women with such concerns might well increase breast feeding uptake.

Second, women with more child-centred attitudes, less concerned about routine and who emphasized responsiveness, were more likely to express intentions to breast feed than those with more restrictive ideas. There is a large body of published work on parental 'controlling' styles and their impact on child development¹⁷. It is not surprising that such attitudes are also likely to influence parental choices concerning infant feeding practices. If these attitudes are important in determining breast feeding intentions in a subgroup of parents, interventions which ignore such attitudes are likely to founder and even alienate parents. Thus formal interventions directed towards increasing breast feeding need to take account of these attitudes and, at an informal level, medical staff promoting breast feeding need to be aware of these issues. For some parents the birth of a child might represent an important loss of control, and the wish not to breast feed might be one of the first external signs of this. The opportunity to discuss such issues with primary health care professionals and midwives at an early stage might have more general benefits on parenting capacities and family relationships.

Two methodological points must be noted in relation to these results. First, the logistic regression excludes any respondent in this very large community study who did not complete all the items pertaining to each separate construct being considered. Not surprisingly the 71% who had completed all the questions had a higher mean educational level and a higher mean age than those women who did not provide all the relevant information. However, it was decided not to control for this difference by reducing the proportion of older, more educated, women in the regression calculations. The existing bias would if anything lead to a decrease in non-breast-feeders, making this a more stringent test of the null hypothesis—that preoccupation with body shape or weight does not influence intention to breast feed. Second, social class as defined by occupation was not available for this sample. While social status as defined by occupation might predict some of the residual variance in breast feeding intentions, we do not think it would be a better predictor than education or than health-related behaviour such as smoking, which is strongly associated with social class²⁵. At the time of the study, the

early 1990s, unemployment was high and a scale based on occupation could have been misleading, particularly for the young and unmarried mothers. As an indicator of social status, home ownership was found to be completely unrelated to breast feeding intentions. There was some residual variance in breast feeding intention not explained by the factors entered into the regression, more so for plans extending up to four months after the child's birth. As the infant becomes integrated into family routines other parental or family characteristics may become more pertinent. For example, maternal plans for resuming work and the attendant issues of child care may influence decisions. However, the maternal attitudes and psychological characteristics identified in this study provide indications of ways to target intervention during pregnancy so as to establish breast feeding immediately after birth.

Women form perceptions of themselves as mothers before childbirth and these perceptions predict parent-child relationships^{26,27}. Health care professionals developing targeted interventions to promote breast feeding should be aware of the findings of this study, so that the predictive factors can be sensitively and carefully enquired about during pregnancy.

Acknowledgments Methodological and statistical help was provided by Rebecca Wheatcroft, Christopher Fairburn and David Thomas.

We are grateful to all mothers who took part and to the midwives for their cooperation and help in recruitment. The ALSPAC study is part of the WHO initiated European Longitudinal Study of Pregnancy and Childhood. The whole ALSPAC study team comprises interviewers, computer technicians, laboratory technicians, clerical workers, research scientists, volunteers and managers. The ALSPAC study could not have been undertaken without the financial support of the Wellcome Trust, the Department of Health, the Department of the Environment and British Gas.

REFERENCES

- 1 Standing Committee on Nutrition of the British Paediatric Association. Is breast feeding beneficial in the UK? *Arch Dis Child* 1994;**71**:376-80
- 2 Howie P, Stewart Forsyth J, Ogston SA, Clark A, Florey CduV. Protective effect of breast feeding against infection. *BMJ* 1990;**300**:11-16
- 3 Wright AL, Holberg CJ, Martinez FD, Morgan WJ, Taussig LM, Group Medical Associates. Breast feeding and lower respiratory tract illness in the first year. *BMJ* 1989;**299**:946-9
- 4 Pollock JI. Long-term associations with infant feeding in a clinically advantaged population of babies. *Devel Med Child Neurol* 1994;**36**:429-40
- 5 Lucas A, Morley R, Cole TJ. Early diet in preterm babies and development status at 18 months. *Lancet* 1990;**335**:1477-81
- 6 Lucas A, Morley R, Cole TJ, Lister G, Leeson-Payne C. Breast milk and subsequent intelligence quotient in children born pre-term. *Lancet* 1992;**339**:261-4
- 7 Lanting CI, Fidler V, Huisman M, Townen BCL, Boersma ER. Neurological differences between 9-year-old children fed breastmilk or formula milk as babies. *Lancet* 1994;**344**:1319-22
- 8 White A, Freeth S, O'Brien M. *Infant feeding 1990*. London: Office of Population Censuses and Surveys, 1992
- 9 Stein A, Cooper PJ, Day A, Bond A. Social and psychiatric factors associated with the intention to breastfeed. *J Reprod Inf Psychol* 1987;**5**:165-71
- 10 Pollock JI, Thomas PW. Starting to breast-feed. Report No. 5 to the Health Promotion Trust on parental health behaviour and development of the child. London: HPT, 1991
- 11 Brinch M, Isager T, Tolstrup K. Anorexia nervosa and motherhood: reproductional pattern and mothering behaviour of 50 women. *Acta Psychiatr Scand* 1988;**77**:98-104
- 12 Van Wezel-Meijler G, Wit JM. The offspring of mothers with anorexia nervosa: a high risk group for under nutrition and stunting? *Eur J Paediatr* 1989;**149**:130-5
- 13 Stein A, Woolley H, Cooper S, Fairburn CG. An observational study of mothers with eating disorders and their infants. *J Child Psychol Psychiatry* 1994;**35**:733-48
- 14 Cooper PJ, Murray L, Stein A. Psychosocial factors associated with early termination of breastfeeding. *J Psychosom Res* 1992;**37**:171-6
- 15 Alder EM, Cox JL. Breast feeding and post-natal depression. *J Psychosom Res* 1983;**27**:139-44
- 16 Hubert J. Belief and reality: social factors in pregnancy and childbirth. In: Richards MPM, ed. *The Integration of a Child into a Social World*. Cambridge: Cambridge University Press, 1974:37-51
- 17 Baumrind D. Rearing competent children. In: Damon W, ed. *Child Development Today and Tomorrow*. San Francisco: Jossey-Bass, 1989:349-78
- 18 Easterbrooks M, Goldberg W. Toddler development in the family: impact of father involvement and parental characteristics. *Child Dev* 1984;**55**:740-52
- 19 Maccoby EE, Martin JA. Socialization in the context of the family: parent-child interaction. In: Mussen PH, ed. *Handbook of Child Psychology*, Vol IV. New York: Wiley, 1983:1-101
- 20 Cox JL, Holden JM, Sagovsky R. Detection of post-natal depression: development of the 10-item Edinburgh Postnatal Depression Scale. *Br J Psychiatry* 1987;**150**:782-6
- 21 Murray D, Cox JL. Screening for depression during pregnancy with the Edinburgh Postnatal Depression Scale (EPDS). *J Reprod Inf Psychol* 1990;**8**:99-107
- 22 Fairburn CG, Beglin SJ. Assessment of eating disorders: interview or self-report questionnaire? *Int J Eating Disord* 1994;**16**:363-70
- 23 Stein A, Stein J, Walters E, Fairburn CG. Eating habits and attitudes amongst mothers of children with feeding disorders. *BMJ* 1995;**310**:228
- 24 *SPSS Advanced Statistics*. Chicago: SPSS Inc, 1994
- 25 Graham H. Women's smoking: government targets and social trends. *Health Visitor* 1993;**66**:80-2
- 26 Belsky J, Fish M, Isabella R. Continuity and discontinuity in infant negative and positive emotionality: family antecedents and attachment consequences. *Devel Psychol* 1991;**27**:421-31
- 27 Heinicke CM, Diskin SD, Ramsey-Klee DM, Given K. Pre-birth characteristics and family development in the first year of life. *Child Devel* 1983;**54**:194-208