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Infant-feeding attitudes of expectant mothers in Northern Ireland

Julie Sittlington¹, Barbara Stewart-Knox¹*, Marion Wright², Ian Bradbury³ and Jane A Scott⁴

Abstract

Northern Ireland (NI) has one of the lowest rates of breast-feeding initiation and duration in both the UK and the industrialized world. This study therefore aimed to explore the relationship between infant-feeding attitudes and feeding intention and outcome in expectant mothers within NI. Expectant mothers (n = 200) were recruited from hospital antenatal booking clinics. Each completed a demographic questionnaire and the self-administered Iowa Infant Feeding Attitude Scale (IIFAS). Participants (n = 192) were followed up after birth through the Northern Ireland Maternity System. The IIFAS distinguished between those mothers who intended to breast-feed (higher IIFAS scores) and those who intended to artificially feed (lower IIFAS scores) as well as between those who breast-fed and those who artificially fed on discharge from hospital. The IIFAS was also able to distinguish between mothers in regard to feeding intention and outcome on the basis of education, socio-economic class, income and marital status. This suggests that the IIFAS could prove useful in the targeting and evaluation of intervention to promote breast-feeding.

Introduction

The benefits of breast-feeding, to both mother and baby, have long been recognized [1], yet Northern Ireland (NI) has one of the lowest rates of breast-feeding in the industrial world [2]. Since the ‘Infant Feeding Survey’ [3] began collating data in 1990, NI, like other countries within the UK, has seen an increase in breast-feeding rates. The rate of increase in breast-feeding initiation rates (defined as the infant suckling from the breast at least on one occasion) has, however, been slower and less marked in NI increasing from 36% in 1990 to 54% in 2000 compared with from 64 to 71% in England and Wales and from 50 to 63% in Scotland. NI also has the lowest rate of breast-feeding duration when compared with England and Wales and Scotland. By 6 weeks, breast-feeding rates drop to 26% in NI, 40% in Scotland and 43% in England and Wales (based on 2000 data). The Republic of Ireland has also reported similar breast-feeding initiation rates (51%) to those in NI and duration at 6 weeks (28%) [4]. The Infant Feeding Survey [3] reports that the highest incidences of breast-feeding occurred among mothers who have spent longer time in education, those in higher occupations, those aged 30 or over, first-time mothers and those from certain ethnic minority backgrounds. Given the low incidence of breast-feeding in NI, in terms of both initiation and duration, and the health benefits of breast-feeding for both mother and child, it has become imperative to explore the attitudes towards infant feeding among expectant mothers within this population group.

Recent studies conducted within NI and further afield have helped to identify particular attitudes
that appear to deter mothers from breast-feeding. Factors associated with breast-feeding initiation or success include a perceived lack of freedom and independence [5], embarrassment both in self and perceived in others when breast-feeding [5–10], the view that breast-feeding should not occur in public but should take place in private [5–8, 11, 12] and the influence of family and/or partner support on the decision to breast-feed [8, 12–15], including concern that the father will feel left out if a mother breast-feeds [7, 8], confusion over the sexual role of the breast [12], exposure to breast-feeding [9], return to work [5, 10, 16], the perceived inconvenience of breast-feeding [5, 7, 10] and the lack of public facilities to allow for discreet breast-feeding [5, 11, 12]. Timing of the decision to breast-feed also appears important [17]. Scott et al. [15] found that women who decide on their preferred feeding method prior to pregnancy are more likely to initiate breast-feeding than those who choose their feeding method during or after the pregnancy. This implies the importance of early intervention in promoting breast-feeding.

De la Mora et al. [18] developed the Iowa Infant Feeding Attitude Scale (IIFAS) as a measure of attitudes towards infant feeding. The scale was found to provide a reliable and valid assessment of maternal attitudes towards breast-feeding and artificial feeding and the scores were found to be predictive of feeding intention. The authors of the IIFAS recommended that further studies should be undertaken to assess the validity and reliability of the scale in diverse samples. The IIFAS has been subsequently administered to expectant mothers and their partners in Scotland [19]. Results again indicated good reliability and validity in predicting choice of infant-feeding method. The IIFAS scores implied that parents of artificially fed infants held some misconceptions about breast-feeding, whereas parents of breast-fed infants were more knowledgeable about the nutritional content and health benefits of breast milk. Findings also indicated that infant-feeding attitudes were likely to be shared by expectant couples [20]. Maternal infant-feeding attitudes were found to be more predictive of feeding choice than paternal infant-feeding attitudes and demographic factors. Given the low rates of breast-feeding in NI and the lack of published research investigating reasons for the low uptake of breast-feeding in this culture, it is important to consider expectant mothers’ attitudes towards infant feeding and to determine the degree to which such attitudes impact upon feeding intention.

The Theory of Reasoned Action holds that intention is an important determinant of behaviour and that intention to engage in a particular behaviour is in turn influenced by an individual’s attitude towards the behaviour together with social expectations in executing the behaviour [21]. That the IIFAS predicted intention to breast-feed, therefore, implied that attitudes represented by the scale were probably good predictors of infant-feeding behaviour. The IIFAS was also able to predict the duration of both exclusive and partial breast-feeding [18]. Results from these studies suggest that the IIFAS is likely to be predictive not only of feeding intention but also of infant-feeding behaviour. This research is novel in that it will consider both infant-feeding intention and outcome. Understanding maternal attitudes to infant feeding will enable better targeting of intervention to increase both initiation and duration of breast-feeding. This study therefore aims to explore the infant-feeding attitudes of expectant mothers within NI and to determine the degree to which they relate to the uptake of breast-feeding.

**Method**

**Sampling**

Recruitment took place over a 4-month period from February to May 2003. All women attending the hospital antenatal clinic (gestational age 8–12 weeks) at the Royal Victoria Hospital, Belfast, over a 3-day period each week were approached. All but two women approached agreed to participate in the study. A subsequent sample of 200 expectant mothers completed the questionnaire. Information on the initial-feeding method and feeding method on discharge was unavailable for a small number of participants (n = 8) who did not subsequently deliver at the hospital.
Procedure
The study was granted approval by the University of Ulster Research Ethical Committee and a Certificate of Indemnity was granted by the Hospitals hosting the research. Before signed informed consent was obtained, all women were assured of confidentiality and advised they could decline to participate or withdraw from the study with no effect to their hospital care. Volunteers completed a short demographic questionnaire and a self-administered infant-feeding attitude scale. Participants were requested to complete the scale in the presence of the researcher in the antenatal clinic waiting area without conferring with others. The completed questionnaire and attitude scale were then returned to the researcher in person on the same day. Information as to the intended infant-feeding method was obtained at recruitment and information as to the birth and initial infant-feeding method was obtained from the Northern Ireland Maternity System (NIMATS) at a later date (February 2004).

The questionnaire
The volunteer’s name, contact details and hospital number for purposes of identification through NIMATS were recorded at the beginning of the questionnaire. The volunteer was then identified by a number henceforth. The questionnaire consisted of 16 questions relating to demographic factors including age, marital status, housing type, living arrangements, education level, family annual income, employment status and occupation (National Statistics Socio-Economic Classification User Manual [22]). Respondents were also asked to self-report their smoking status ‘yes’, ‘no’ or ‘ex-smoker’ and previous obstetric history, the number of live births 0–4+ and previous infant-feeding outcome. Respondents were required to indicate whether their infant-feeding intention was ‘formula feeding’, ‘undecided’ or ‘breast-feeding’. Mothers were also asked ‘have you ever seen a woman breast-feed her child before?’ to which she could respond ‘yes’ or ‘no’.

The IIFAS was used to assess each expectant mother’s attitude towards infant feeding. The scale has previously been tested for reliability and validity [18], and has been found to have high internal consistency as well as to be predictive of chosen infant-feeding method as well as the duration of breast-feeding. The IIFAS consists of 17 attitude questions, half of which are favourable to breast-feeding and the remaining favourable to artificial feeding. Responses were on a bipolar five-point Likert scale ranging from strongly agree (1) to strongly disagree (5). Items favouring artificial feeding were reverse scored according to how the tool was validated [18] and a total attitude score computed via an equally weighted sum of responses. Total attitude scores could range from 17 (indicating positive attitudes towards artificial feeding) to 85 (reflecting positive attitudes towards breast-feeding). A score of 51 indicated a neutral attitude.

Data analysis
Data were analysed using the Statistical Package for Social Sciences (SPSS) Version 11.0. The IIFAS, in producing data on an interval scale, is amenable to parametric analysis, providing the sample size is adequate and the data meet the criteria of normal variance [18]. One-way analysis of variance (ANOVA) and independent sample t-tests were carried out to assess how IIFAS scores relate to socio-demographic factors. Post hoc analysis comparisons (Bonferroni) were used to interpret the main effects. One-way ANOVA was employed to determine differences in mothers’ infant-feeding attitudes in relation to feeding intention (breast-feeding, undecided and artificial feeding). Independent sample t-tests were performed to assess the differences in mothers’ infant-feeding attitudes in relation to feeding outcome (breast-feeding/artificial feeding). P values <0.05 were considered significant.

Results
Sample description
The majority of mothers were multiparous (58.9%), non- or ex-smokers (74.5%), married or cohabiting (77.1%) and living in owner-occupied housing
The age range was between 16 and 35 years [16–25 years (33.3%), 26–30 years (28.1%), 31–35 years (31.8%)], and had completed secondary education (53.1%) with 35.4% having studied at university or college and a further 11.5% having studied to postgraduate level. The majority of mothers were in employment, 45.3% in full-time employment and 25% working part-time, with the majority of mothers (73.4%) planning to return to employment post-birth. A slightly higher percentage of mothers were in the intermediate or higher occupation categories [higher occupations (35.4%), intermediate occupations (22.9%), lower occupations (20.8%), never worked and long-term unemployed (20.8%)] and the majority of mothers had a family annual income of more than £20 000 [<10 000 (23.4%), £10 000–19 999 (18.2%), £20 000–29 999 (22.9%), £30 000–39 999 (19.3%), £40 000+ (15.7%)]. Most of the expectant mothers had previously witnessed breast-feeding (81.3%).

Feeding intention and behaviour
At the time of data collection (approximate gestational age 8–12 weeks), 32.3% of mothers intended to artificially feed, 42.7% intended to breast-feed and 25% were undecided as to how they would feed their baby. At the time of discharge from hospital, 59.9% of mothers were exclusively artificial feeding and 40.1% were exclusively breast-feeding. Over half of all mothers (51%) attempted to breast-feed in the interim period between birth and discharge from hospital. The majority of mothers who were initially undecided as to their chosen feeding method subsequently chose to artificially feed (79.2%) with just over one-third of those mothers attempting to breast-feed (37.5%). Mothers who were initially undecided and then chose to breast-feed tended to agree more with ‘breast-fed babies are healthier than formula-fed babies’ (t = −2.084, df = 46, P = 0.043). The majority of mothers who intended to artificially feed did so (95.2%), with a small number choosing to try breast-feeding (8.1%) and a small proportion of those were discharged from hospital breast-feeding (4.8%). The majority of mothers who intended to breast-feed attempted to do so (91.5%), with a smaller number discharged from hospital breast-feeding (78%) while the remaining, almost one-quarter (22%), chose to artificially feed. Less than half of mothers (40.8%) intended to have returned to work before 6 months and a further 13.9% before 12 months. The remainder (45.3%) did not appear to know their employment intention.

Infant-feeding attitudes and demographic factors
Mothers who were married or cohabiting (t = 4.701, df = 98.921, P < 0.001), who were living in owner-occupied accommodation (t = −4.246, df = 151.470, P < 0.001) and who were non- or ex-smokers (t = −3.191, df = 190, P < 0.01) had higher IIFAS scores, indicating more favourable attitudes towards breast-feeding. There were also differences in regard to education level (F(2, 189) = 6.425, P < 0.01), employment status (F(3, 188) = 5.502, P < 0.01), socio-economic class (F(3, 188) = 5.841, P < 0.01) and family annual income (F(4, 186) = 6.399, P < 0.001). Post hoc analysis indicated that mothers educated to the postgraduate level had more favourable attitudes to breast-feeding than those educated to secondary level (M difference = −7.53) (P < 0.005), mothers in full-time employment had more favourable attitudes towards breast-feeding than unemployed mothers or students (M difference = 6.32) (P < 0.05), mothers in part-time employment had more favourable attitudes towards breast-feeding than unemployed mothers or students (M difference = 7.68) (P < 0.01), mothers whose socio-economic class is in the higher occupations had more favourable attitudes towards breast-feeding than those who have never worked (M difference = 7.61) (P < 0.005) and attitudes became more favourable towards breast-feeding as household income increased <10 000 and 20 000–29 999 (M difference = −6.26) (P < 0.05), <10 000 and 30 000–39 999 (M difference = −8.61) (P < 0.005) and <10 000 and 40 000+ (M difference = −9.39) (P < 0.001).

Mothers who had previously seen another woman breast-feed (t = 5.051, df = 84.683, P < 0.001) and who planned to return to work after the birth of her child (t = 3.636, df = 190, P < 0.001) had more favourable attitudes towards breast-feeding (Table 1).
Infant-feeding attitudes, feeding intention and outcome

The sample was split into three groups according to feeding intention (breast/artificial/undecided) and infant-feeding outcome (breast/artificial) and the differences in attitude scores between the groups were analysed. The IIFAS showed good internal reliability, having a Cronbach’s $\alpha$ of 0.79. Suggesting that the data meet the criteria for parametric analysis, there were no extreme outlying scores. Similar results were obtained using the Mann–Whitney $U$-test. High scores indicate favourable attitudes towards breast-feeding.

Differences in attitude scores (IIFAS) indicated that those electing to feed artificially tended to have the lowest scores (mean 49.71, SD 5.9, range 37–67), those who were undecided had intermediate scores (mean 55.06, SD 6.62, range 42–70) and those intending to breast-feed, the highest scores (mean 65.23, SD 8.57, range 41–82) ($F(2, 189) = 83.47, P < 0.001$). These differences were also reflected in feeding outcomes. Indicating more favourable attitudes towards breast-feeding, mothers who attempted to breast-feed (mean 62.95, SD 9.70) had higher total scores when compared with those who had not (mean 52.18, SD 6.86) ($t = 8.908$, df = 174.930, $P < 0.001$). Breast-feeding mothers had significantly higher IIFAS scores than mothers who were artificially feeding (breast-feeding mean 64.43, SD 9.68; artificially feeding mean 53.16, SD 7.31) ($t = –9.181$, df = 190, $P = 0.000$).

There were differences between those intending to breast-feed, those intending to feed artificially and those who were undecided in regard to items favourable to breast-feeding. Mothers intending to breast-feed were more likely to agree with the statements: ‘breast-feeding increases mother–infant bonding’ ($F(2, 189) = 10.31, P = 0.000$), ‘formula-fed babies are more likely to be overfed than breast-fed babies’ ($F(2, 189) = 10.16, P = 0.000$), ‘mothers who formula feed miss one of the great joys of motherhood’ ($F(2, 189) = 20.95, P = 0.000$), ‘breast-fed babies are healthier than formula-fed babies’ ($F(2, 189) = 34.99, P = 0.000$), ‘breast milk is the ideal food for babies’ ($F(2, 189) = 25.09, P = 0.000$), ‘breast milk is more easily digested than formula’ ($F(2, 189) = 14.95, P = 0.000$), ‘breast-feeding is more convenient than formula’ ($F(2, 189) = 10.34, P = 0.000$) and ‘breast milk is cheaper than formula’ ($F(2, 189) = 4.07, P = 0.019$). Again the scores of mothers who were undecided as to their feeding method fell between those of the artificially feeding and breast-feeding groups. In regard to feeding outcome, breast-feeding mothers were more likely than mothers who were feeding their babies artificially to agree to items favourable to breast-feeding: ‘breast-feeding increases mother–infant bonding’ ($t = –3.583$, df = 190, $P = 0.000$), ‘formula-fed babies are more likely to be overfed than breast-fed babies’ ($t = –3.733$, df = 190, $P = 0.000$), ‘mothers who formula feed miss one of the great joys of motherhood’ ($t = –4.252$, df = 190, $P = 0.000$), ‘breast-fed babies are healthier than formula-fed babies’ ($t = –7.076$, df = 190, $P = 0.000$), ‘breast milk is the ideal food for babies’ ($t = –6.764$, df = 190, $P = 0.000$), ‘breast milk is more easily digested than formula’ ($t = –5.724$, df = 190, $P = 0.000$), ‘breast-feeding is more convenient than formula’ ($t = –4.065$, df = 190, $P = 0.000$) and ‘breast milk is cheaper than formula’ ($t = –3.003$, df = 190, $P = 0.003$) (Table II).

Mothers intending to artificially feed were more likely to agree with items favourable to artificial feeding: ‘the benefits of breast milk last only as long as the baby is fed’ ($F(2, 189) = 27.02, P = 0.000$), ‘formula feeding is more convenient than breast-feeding’ ($F(2, 189) = 26.64, P = 0.000$), ‘breast milk is lacking in iron’ ($F(2, 189) = 7.5, P = 0.001$), ‘formula feeding is the better choice if the mother plans to go out to work’ ($F(2, 189) = 28.05, P = 0.000$), ‘breast-fed babies are more likely to be overfed than formula-fed babies’ ($F(2, 189) = 4.3, P = 0.015$), a ‘father feels left out if a mother breastfeeds’ ($F(2, 189) = 3.01, P = 0.051$) and ‘formula is as healthy for an infant as breast milk’ ($F(2, 189) = 28.56, P = 0.000$). Scores of mothers who were undecided as to their feeding method fell between artificial and breast-feeding intenders. Mothers who were artificially feeding on discharge from hospital were more likely to agree with statements favourable to artificial feeding: ‘the benefits of breast
milk last only as long as the baby is fed’ \((t = -4.356, \text{ df} = 190, P = 0.000)\), ‘formula feeding is more convenient than breast-feeding’ \((t = -7.6, \text{ df} = 190, P = 0.000)\), ‘formula feeding is the better choice if the mother plans to go out to work’ \((t = -4.206, \text{ df} = 190, P = 0.000)\) and ‘formula is as healthy for an infant as breast milk’ \((t = -5.839, \text{ df} = 190, P = 0.000)\) (Table II).

### Discussion

The IIFAS when completed by expectant mothers (gestational age 8–12 weeks) has been shown to be able to distinguish between mothers who have a higher, intermediate or lower propensity to breast-feed and can apparently predict which mothers will breast-feed. High IIFAS scores were associated with intention to breast-feed, while lower scores indicated intention to artificially feed. Mothers who were undecided had intermediate scores. Differences in attitudes were evident between the three feeding intention groups (breast-feeding, artificial feeding and undecided). The scale was also able to predict feeding outcomes. The IIFAS indicated higher scores for mothers who breast-fed than those who artificially fed on discharge from hospital. Items favourable to breast-feeding were able to
<table>
<thead>
<tr>
<th>No.</th>
<th>Infant-feeding attitudes</th>
<th>Feeding intention&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Feeding outcome on exit</th>
<th>P</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Artificial (n = 62), mean (SD)</td>
<td>Undecided (n = 48), mean (SD)</td>
<td>Breast (n = 82), mean (SD)</td>
<td>Artificial (n = 115), mean (SD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>The benefits of breast milk last only as long as the baby is fed</td>
<td>2.81 (1.2)</td>
<td>3.13 (1.23)</td>
<td>4.18 (1.12)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>2</td>
<td>Formula feeding is more convenient than breast-feeding</td>
<td>2.1 (1.13)</td>
<td>2.94 (1.33)</td>
<td>3.65 (1.32)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>4</td>
<td>Breast milk is lacking in iron</td>
<td>3.32 (0.86)</td>
<td>3.52 (1.05)</td>
<td>3.95 (1.05)</td>
<td>0.001</td>
</tr>
<tr>
<td>6</td>
<td>Formula feeding is the better choice if the mother plans to go out to work</td>
<td>2.18 (1.34)</td>
<td>2.54 (1.11)</td>
<td>3.65 (1.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>8</td>
<td>Women should not breast-feed in public places</td>
<td>4.02 (1.37)</td>
<td>3.46 (1.41)</td>
<td>3.83 (1.39)</td>
<td>0.111</td>
</tr>
<tr>
<td>10</td>
<td>Breast-fed babies are more likely to be overfed than formula-fed babies</td>
<td>3.71 (1.01)</td>
<td>3.5 (0.85)</td>
<td>4 (0.99)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>11</td>
<td>Fathers feel left out if a mother breast-feeds</td>
<td>3.21 (1.42)</td>
<td>3.35 (1.16)</td>
<td>3.72 (1.25)</td>
<td>0.05</td>
</tr>
<tr>
<td>14</td>
<td>Formula is as healthy for an infant as breast milk</td>
<td>2.26 (1.16)</td>
<td>2.77 (0.99)</td>
<td>3.62 (1.09)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>17</td>
<td>A mother who occasionally drinks alcohol should not breast-feed her baby</td>
<td>2.61 (1.52)</td>
<td>2.65 (1.23)</td>
<td>2.74 (1.24)</td>
<td>0.828</td>
</tr>
<tr>
<td>3</td>
<td>Breast-feeding increases mother–infant bonding</td>
<td>3.27 (1.53)</td>
<td>3.9 (1.17)</td>
<td>4.27 (1.19)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>5</td>
<td>Formula-fed babies are more likely to be overfed than breast-fed babies</td>
<td>2.42 (1.15)</td>
<td>2.71 (0.85)</td>
<td>3.21 (1.09)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>7</td>
<td>Mothers who formula feed miss one of the great joys of motherhood</td>
<td>2.1 (1.33)</td>
<td>2.52 (1.26)</td>
<td>3.46 (1.29)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>9</td>
<td>Breast-fed babies are healthier than formula-fed babies</td>
<td>2.18 (1.26)</td>
<td>3.08 (1.09)</td>
<td>3.83 (1.15)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>12</td>
<td>Breast milk is the ideal food for babies</td>
<td>3.34 (1.23)</td>
<td>4 (0.95)</td>
<td>4.61 (1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>13</td>
<td>Breast milk is more easily digested than formula</td>
<td>3.24 (0.95)</td>
<td>3.71 (0.99)</td>
<td>4.2 (1.13)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>15</td>
<td>Breast-feeding is more convenient than formula</td>
<td>2.85 (1.32)</td>
<td>3.02 (1.14)</td>
<td>3.73 (1.21)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>16</td>
<td>Breast milk is cheaper than formula</td>
<td>4.1 (1.2)</td>
<td>4.27 (1.03)</td>
<td>4.59 (0.92)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Total score</td>
<td>49.71 (5.9)</td>
<td>55.06 (6.62)</td>
<td>65.23 (8.57)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<sup>a</sup>Feeding intentions were measured during pregnancy (8–12 weeks gestation).
distinguish between those who were artificially feeding and those who were breast-feeding. The finding that breast-feeding mothers had higher scores than those who artificially fed also corresponds well with those of other studies [18, 20]. The apparent ability for the IIFAS to distinguish between mothers on the basis of feeding outcome compares well with findings from research that has employed the IIFAS in Scotland [20]. This study is unique in that it also reports data related to infant-feeding intention. The IIFAS can apparently distinguish between mothers on the basis of feeding intention. These findings also suggest that both infant-feeding intention and outcome can be predicted from attitudes to infant feeding. The scale showed a high level of internal consistency and reliability that was comparable to that obtained by the original authors of the scale ($\alpha$=0.86) [18] and to previous research carried out in Scotland ($\alpha$ = 0.79) [20].

Mean scores suggested that, irrespective of infant-feeding intention or outcome, mothers agreed that ‘women should not breast-feed in public places’. Previous studies carried out in NI, although they haven’t employed the IIFAS, have implied negative attitudes to breast-feeding in public. For example, a majority of schoolchildren surveyed believed that breast-feeding should be prohibited in public, while more than half reported that they would feel embarrassed if they saw a woman breast-feed [6]. Women breast-feeding experienced embarrassment both in self and perceived in others, even friends and family [5]. Similar findings have been reported among mothers in the Republic of Ireland [7]. Respondents also agreed, irrespective of feeding intention or outcome, that ‘a mother who occasionally drinks alcohol should not breast-feed her baby’. It is possible that this belief could deter some mothers from breast-feeding. Some mothers may prefer to feed their baby artificially than to cease drinking alcohol. In addition, there was agreement between all mothers irrespective of feeding outcome that ‘breast milk is lacking in iron’ and that ‘breast-fed babies are more likely to be overfed than formula-fed babies’. These responses may indicate a failure to communicate to mothers the idea that breast milk is the ideal food for their baby. There was also agreement irrespective of feeding outcome that a ‘father will feel left out if a mother breast-feeds’. This perception has been reported previously in other studies [7, 23] and implies that health promotion strategies need to suggest other ways in which fathers can become involved with their infants.

IIFAS scores also distinguished between mothers on the basis of demographic factors. Mothers who attained higher scores, indicating a preference for breast-feeding, tended more often to be married or cohabiting; to live in owner-occupied accommodation; to be non- or ex-smokers; to have undergone higher education; to be in full- or part-time employment, usually in higher occupations, and to have a higher family annual income. These findings are consistent with those from the ‘Infant Feeding Survey 2000’ [3] where the highest incidences of breast-feeding occurred among mothers who had spent more time in education and had higher occupations. Unlike findings from the Infant Feeding Survey where mothers with a tendency to breast-feed rather than artificially feed were often older and primiparous, this study found that neither parity nor age influenced attitudes to infant feeding. Mothers who had previously been exposed to breast-feeding models had more positive attitudes towards breast-feeding, suggesting previous exposure to breast-feeding has a favourable impact on maternal attitudes. More surprising was that mothers who planned to return to work postnatally also had more favourable attitudes towards breast-feeding. This could be because those who intended to return to work were of higher social class and had spent a longer time in education.

Although the sample size employed in this study was relatively small ($n = 200$), compliance was good. That these results are similar to those of other studies using the IIFAS, however, suggests that the sample size was adequate. The sample, however, may not be representative of women of childbearing age in NI. Compared with the data from NI collated in the Infant Feeding Survey 2000 [3], those in the youngest age bracket were over-represented (12% difference) while those in the
eldest age bracket were under-represented (7% difference). Compared with the Northern Ireland Census 2001 [24], this sample has a slightly higher percentage of mothers in the higher occupations (9% difference) and a lower percentage in the lower occupations (23.1%). These variations, particularly that those who were younger were somewhat over-represented and, therefore, may be less predisposed to breast-feed [3], are likely to have strengthened the findings. These findings should nevertheless be tested through further research employing a larger, more representative sample of mothers.

A possible limitation of the study, especially given that the research took place in hospital antenatal clinics, is that the context of the research may have primed respondents to give what they perceived to be socially desirable responses. Such potential for bias could, however, apply to any survey study. All respondents were assured that their participation in the study would not affect their hospital care and the information provided would be held in confidence and not shared with medical staff, making it unlikely that this was the case. Another possible limitation was the risk of reactivity from the IIFAS itself. Although the women completed the IIFAS once during 8–12 weeks gestation, it may have inadvertently had an influence on their final decision to breast-feed or formula feed. The proportion of the sample electing to breast-feed (51%), however, was comparable to that found by the Infant Feeding Survey [3], which indicated a breast-feeding initiation rate of 54% for NI. This suggests that it was unlikely that the scale had an inadvertent impact on feeding intention or outcome. All questionnaires were completed under similar conditions in antenatal clinics. Other factors which were unknown and which may have influenced participants overall feeding outcome include mode of delivery as some studies have shown that caesarean sections may reduce the uptake of breast-feeding [1]; birth weight of the infant as the uptake and duration of breast-feeding has been reported to be reduced with infants with a very low birth weight [25, 26]; the sex of the child, particularly having a male infant may be associated with successful breast-feeding [27]; complications during the birth or affecting maternal health and whether or not the mother attended parent-craft classes.

**Conclusion**

This appears to be the first infant-feeding attitude survey carried out in NI. Although exploratory, the findings from this study provide evidence for the reliability and validity of the IIFAS. The scale has been shown to enable mothers with a higher propensity to breast-feed to be identified. Knowledge of infant-feeding attitudes (IIFAS) could prove useful in targeting and assessing intervention to promote breast-feeding.

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**Conflict of interest statement**

None declared.

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