



RESEARCH ARTICLE



Norwegian general practitioners' knowledge and beliefs about breastfeeding, and their self-rated ability as breastfeeding counsellor

Heidi R Svendby^a, Beate F Løland^b, Marianne Omtvedt^a, Solveig T Holmsen^b and Per Lagerløv^a

^aDepartment of General Practice/Family Medicine, Institute of Health and Society, Faculty of Medicine, University of Oslo, Norway;

^bNorwegian National Advisory Unit on Breastfeeding, Women and Children's Division, Oslo University Hospital, Rikshospitalet, Oslo, Norway

ABSTRACT

Background: Breastfeeding is considered the best infant-feeding method. Norway is one of the leading countries in terms of breastfeeding initiation and duration. To maintain this high breastfeeding rate, it is important to understand the factors that influence breastfeeding. A doctor's advice can improve the rates of breastfeeding initiation and duration, but not all doctors are competent in breastfeeding counselling. **Objectives:** The aim of this study was to identify the knowledge and beliefs of general practitioners (GPs) about breastfeeding in Norway and to investigate how important they considered guidance about breastfeeding initiation and duration before and after birth. **Design:** A questionnaire study about knowledge and beliefs according to predefined correct responses and about self-perceived competence as an advisor. **Subjects:** 122 GPs engaged in apprenticeship for medical students. **Results:** The response rate was 57%, 69 GPs participated. The questions were answered correctly according to national consensus for 49 % for the knowledge items and 64 % of the belief items. The GPs believed that their guidance was more important after than before birth. Female GPs had more confidence in their guidance ability than male GPs. Confidence in the GPs' own guidance after birth was associated with knowledge about contraindications to breastfeeding. **Conclusion:** Although the GPs expressed beliefs favouring breastfeeding they partly lacked basic knowledge. The GPs' confidence in own guidance was better after than before birth and was higher among those with more knowledge. Improved knowledge and emphasis on guidance before birth should be promoted among GPs.

KEY POINTS

- Breastfeeding is the best infant-feeding method. Doctors' advice improves the rates of breastfeeding, but not all doctors have sufficient knowledge. This study mapped the knowledge and beliefs among Norwegian GPs. The study revealed that:
- GPs partly lacked basic knowledge to effectively promote breastfeeding.
- GPs had less confidence as advisers during pregnancy than after delivery.
- Most GPs agreed that knowledge about breastfeeding is basic and should be taught as an integral part of medical school programmes.

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Introduction

The World Health Organization (WHO) [1] and the Norwegian Directorate of Health both recommend exclusive breastfeeding for the first 6 months and total breastfeeding for a duration of 2 or at least 1 year, respectively. Human milk is tailored for infants, and breastfeeding is associated with improved child and maternal health. Although statistics from 2006 show that 99% of Norwegian women initiated breastfeeding, total breastfeeding duration is shorter than recommended.[2] Recent studies from Sweden indicate that the proportion

of children who are breastfed is slightly declining from 2004.[3] A corresponding survey from Norway conducted in 2013 revealed the same tendency especially for children older than 6 months.[4] The Baby-Friendly Hospital Initiative provides strategies to assist and encourage breastfeeding. This initiative is expanding to Baby-Friendly Community Health Services in Norway, in a still ongoing process that started in 2005. Knowledge about the benefits of breastfeeding has steadily increased and has been promoted (reviewed in [5]).

CONTACT Per Lagerløv per.lagerlov@medisin.uio.no Department of General Practice/Family Medicine, Faculty of Medicine, University of Oslo, Pb 1130 Blindern, Oslo 0318, Norway

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Professional support has been identified as important to the success of breastfeeding.[6] A doctor's counselling and support can improve the rates of breastfeeding initiation and duration.[6,7] Most women decide on a feeding method during pregnancy, which provides health professionals with an excellent opportunity to guide the woman prior to delivery.[8,9] However, a Norwegian survey from 2003 showed that 40% of pregnant women had not received breastfeeding information.[10] A recent project from an obstetric practice in the USA demonstrated that prenatal breastfeeding education delivered through computer tablets was well accepted by women and might increase the rates of exclusive breastfeeding.[11] Professionals have also been criticized for their lack of empirical knowledge and for giving conflicting advice.[12] Breastfeeding problems and complications arise, and doctors in primary care should be capable of giving advice to help prevent early cessation of breastfeeding.

The aim of this study was to understand the knowledge and beliefs of general practitioners (GPs) about breastfeeding in Norway and to investigate how important they considered guidance about breastfeeding initiation and duration before and after birth. We also sought to identify factors associated with self-rated ability to counsel on breastfeeding.

Materials and methods

Design

This was a cross-sectional questionnaire-based survey among GPs with responsibility for medical students in general practice at the University of Oslo, but without special qualification as breastfeeding counsellors.

Setting

The annual number of childbirths in Norway is ~60.000. Almost all women consult their GP and a midwife for antenatal care. A minimum of seven consultations by a midwife or a GP is recommended (in Norway) during pregnancy. After delivery, the child is examined at least three times by a GP at Public Health Centres during their first year of life. These contacts are free of charge.

Main outcome

For each of the questions, 4–6 options were given. The answers were dichotomized into agreement or not with predetermined answers. A sum score for each

theme was calculated by summing the number of correct responses divided by the number of participants.

Questionnaire

We were not aware of any validated questionnaires suitable for the purpose of the present study; accordingly we developed one based on existing literature (reviewed in [5]). The Norwegian National Advisory Unit on Breastfeeding determined what should constitute appropriate responses to the knowledge items. The correct response to belief items about social influence on breastfeeding is less well defined; it is based on experience gained at the Advisory Unit. These predetermined answers are given in parentheses in Tables 2 and 3, but were not presented to the GPs. The questionnaire was piloted by four GPs at the Department of General Practice, University of Oslo, and improvements were made based on requested feedback.

The questionnaire was structured into five sections; demographic data, confidence as adviser, knowledge about breastfeeding, beliefs about breastfeeding, and finally sources for knowledge about medicine use during lactation. In the latter section, a question about how basic they considered information about breastfeeding was included. The first section dealt with demographic variables. The second section comprised the following two questions: How much do you think your guidance influences the pregnant woman's choice to breastfeed? How much do you think your guidance affects the lactating woman's decision to continue breastfeeding even if she experiences breastfeeding problems? The response options were: Very much, much, little, and very little influence. The answers were dichotomized to high or low confidence as a counsellor.

In the third section, respondents were asked about their knowledge of breastfeeding and human milk. A total of 31 questions covered the following themes: facts about breastfeeding, consequences for mother and child health, knowledge about mastitis, and contraindications to breastfeeding.

The fourth section examined beliefs about breastfeeding. Twelve belief statements were divided into four themes: *significance* or importance of breastfeeding, *social* influence of other close persons on the mother's decision to breastfeed, *cosmetic* effects of breastfeeding on the mother, and *relationship* or whether breastfeeding creates closeness or distance between parents.

The fifth section, not tabulated, comprised the following questions about sources of information: When

you have questions concerning the use of medicines during lactation, how frequently would you consult. The Industry Formulary or The Public Formulary (Norwegian Drug Handbook)? How important do you consider knowledge about breastfeeding? The response alternatives were: It represents basic knowledge and should be taught at medical school, or it should be considered specialized knowledge and hence be learned after study for those engaged in mother–child care.

Data sampling

A letter recommending participation was mailed from the Faculty of Medicine, University of Oslo in 2011. The questionnaire was mailed two weeks later with a stamped return envelope. A reminder letter was sent once, if needed, after one month. Return of a completed questionnaire was deemed implied consent.

Data analysis

The sum scores of the knowledge and belief questions are presented as means and are grouped according to the GPs' gender; differences between genders were examined using analysis of variance *t*-tests.

To examine the association between the GPs' evaluation of their counselling ability and the corresponding sum scores of their knowledge about breastfeeding, a logistic regression analysis was performed. The dependent variable, high or low confidence as a counsellor after birth, was adjusted for five independent variables: gender (ref. male); senior age (ref. age >55 years); beliefs about the social impact of others (*social*), basic knowledge of breastfeeding (*facts*), and contraindications to breastfeeding (*contraindications*). Five independent variables were considered as maximum in the model; a model giving a small Akaike Information Criterion was selected, *p*-values <0.05 were considered significant.

The study was approved by the Norwegian Social Science Data Services (reference 25024).

Results

The response rate was 57%, 69 out of 122 GPs participated. The response rate for each gender and demographic data describing the participating GPs are shown in Table 1. Next, all GPs participated in antenatal care, and the majority had experience from check-ups of children at Public Health Centres.

On average, 49% of the knowledge questions were answered correctly according to the answer key

Table 1. Data describing the participating 69 Norwegian general practitioners

Characteristic	Proportion (%)	Number	Total number
Response rate	57	69	122
Response rate females	78	28	36
Response rate males	48	41	86
Age above 55 years	38	23	68
Have been fed human milk as a child	71	49	69
Have own children	87	60	69
Have given last own child breastmilk	95	57	60
Participate in antenatal care	97	67	69
Work at a Public Health Centre for children	35	24	69
Worked earlier at a Public Health Centre	29	20	69

(Table 2): less than half of the GPs knew the Norwegian recommendations for breastfeeding duration, importance of secretory immunoglobulin A, and the frequency of night feeding. However, most valued breastfeeding in preventing gastrointestinal infections, allergies, obesity, and maternal breast cancer. Most GPs knew about the causes of sore nipples and the first measures to implement when the breast is inflamed, but they knew less about the bacterial aetiology and symptoms of fungal infection. Only 41% (28/69) considered maternal human immunodeficiency virus (HIV) infection to represent a contraindication for breastfeeding (Table 2).

Female GPs had greater knowledge about contraindications to breastfeeding than male GPs. From a maximum sum score of 6, the mean score was 2.82 (SD 1.14) for women and 2.11 (SD 1.08) for men (*p* = 0.019). The sum scores on "facts", "consequences", and "mastitis", questions presented in Table 2, did not differ significantly between men and women. Concerning sources of information regarding medication during the breastfeeding period, The Industry Formulary was consulted often or very often by 87% (60/69) of GPs, whereas 38% (26/68, one missing) would use The Public Formulary often or very often.

The mean percentage of belief responses considered correct was 64% (Table 3). Only 26% (18/69) stated correctly that formula and human milk differ with respect to nourishment and long-term health effects. The influence of the mother/mother-in-law and friends was affirmed by 81% (56/69), but only half agreed that the child's father had a great influence on a woman's decision to breastfeed. Forty-two percent (29/69) did not consider that breastfeeding impaired the breast cosmetically, and 68% (47/69) associated breastfeeding with rapid weight loss after birth. Most GPs agreed to statements that breastfeeding increases mother–infant bonding, does not create a distance between father and mother, and does not complicate the father–child connection (Table 3).

Table 2. Percentage of correct answers to multiple-choice knowledge questions about breastfeeding among 28 female and 41 male general practitioners

	Number and percentages of correct answers			
	Women		Men	
	N ^a	%	N ^a	%
Knowledge questions about breastfeeding (Correct answers in parentheses)				
Facts				
For how many months do you recommend exclusive breastfeeding in general (6 months)	10	36	17	42
For how long do you recommend that the child is given breast milk in total (12 months)	15	54	15	37
Which immunoglobulin is transferred from the mother to the child and protects against infections (sIgA ^b)	12	43	19	46
A 5-month-old child who is breastfed exclusively will usually be breastfed during the night (true)	17	61	16	39
Consequences				
Breastfeeding protects against which of the following infections:				
Skin infections (false)	22	79	37	90
Eye infections (false)	23	82	37	90
GI infections (true)	23	82	27	66
Upper respiratory infections (true)	16	57	25	61
Urinary tract infections (true)	4	14	2	5
Lower respiratory infections (true)	13	46	16	39
Breastfeeding has positive effects on the following aspects of a child's health:				
Improves cognitive development (true)	12	43	13	32
Protects against autoimmune diseases (true)	7	25	16	39
Prevents enuresis (false)	15	54	25	61
Protects against allergy (true)	28	100	34	83
Prevents obesity (true)	25	89	30	73
Breastfeeding might have positive effects on the following aspects of a mother's health:				
Infections (false)	18	64	16	39
Breast cancer (true)	24	86	24	59
Osteoporosis (true)	5	18	14	34
Type 2 diabetes (true)	12	43	13	32
Ovarian cancer (true)	16	57	15	37
Cardiovascular disease (true)	8	29	10	24
Mastitis				
What is the most common cause of sore nipples?(poor attachment of the infant at the breast)	22	79	21	51
What is the most important measure if the breast is red, hot, swollen, and painful? (empty breast frequently by breastfeeding, expressing, or pumping)	27	96	38	93
What is the most common cause of infection of the breasts in the first few weeks postpartum? (Staphylococcus aureus)	6	21	13	32
What is characteristic of a fungal infection in or on the breast? (the woman experiences a burning pain in the breast between feedings)	11	39	13	32
Contraindications				
A woman with a 5-month-old child wonders if she can have a couple of glasses of wine during a family gathering. What advice would you give her? (yes, but wait for 3 h after one glass before you breastfeed)	14	50	17	42
How strongly do you confirm these factors imply that the mother should stop breastfeeding/not breastfeed?				
The mother has HIV (true)	14	50	15	37
The mother is taking the following medication: paracetamol for headaches (false)	18	64	18	44
zopiklon for insomnia (false)	4	14	9	22
SSRI ^c for depression (false)	5	18	3	7
The mother smokes 10 cigarettes a day (false)	16	57	24	59

Four to six options were given for each question. The responses were dichotomized into agreement with or not in agreement with the predetermined answers (the correct response are shown in parenthesis).

^aMissing values 0–4

^bSecretory IgA

^cSelective serotonin reuptake inhibitor

Table 3. Responses to statements about breastfeeding among 28 female and 41 male general practitioners

	Beliefs in agreement with correct answers				
	Women		Men		Total
Statements about breastfeeding beliefs (correct answers of beliefs in parentheses)	N ^a	%	N ^a	%	%
Significance					
Almost all women can breastfeed if they are motivated (true)	26	93	35	85	88
Breastfeeding and formula are equivalent for nourishing an infant (false)	11	39	7	17	26
If a woman chooses not to breastfeed after receiving adequate information, you will support her decision (true)	15	54	15	36	44
The long-term health of formula-fed versus breastfed children is equal (false)	7	25	11	27	26
Social					
Advice from her mother/mother-in-law has a great influence on a woman's choice to breastfeed (true)	21	75	35	85	81
Advice from female friends has a great influence on whether a woman chooses to breastfeed (true)	24	86	35	85	86
The child's father has great influence on whether a woman chooses to breastfeed (true)	20	71	17	42	54
Cosmetics					
The woman's breasts will be cosmetically impaired from breastfeeding (false)	12	43	17	42	42
Breastfeeding will make a woman lose weight faster after giving birth (true)	23	82	24	59	68
Relationships					
Breastfeeding increases mother–infant bonding (true)	25	89	38	93	91
Breastfeeding creates an increased distance between mother and father (false)	23	82	30	73	77
Breastfeeding complicates the connection between a father and his child (false)	25	89	31	76	81

Four to six options were given for each question. The responses were dichotomized into agreement with or not in agreement with the predetermined answers (the correct response are shown in parenthesis).

^aMissing values 0 or 1

Table 4. Factors associated with 69 doctors' high or low confidence as advisor after birth: a logistic regression model analysing gender, age and sum scores on: social influence, knowledge about facts, contraindications to breastfeeding, significance of own beliefs and influence of other persons on breastfeeding. Five dependent variables were considered sufficient in the model; a model giving a small Akaike Information Criterion was selected.

Variables	Unadjusted OR (95% CI)	<i>p</i> value	Adjusted OR (95% CI)	<i>p</i> value
Gender (reference male)	17.280 (2.133–140.021)	0.008	10.084 (1.012–100.436)	0.049 ^a
Senior age (reference above 55 years)	0.469 (0.152–1.477)	0.188	1.303 (0.259–6.549)	0.748
<i>Social</i> (sum scores on beliefs about social impact of others)	1.671 (0.925–3.019)	0.089	1.087 (0.367–3.220)	0.880
<i>Facts</i> (sum scores on facts about breastfeeding)	0.889 (0.518–1.525)	0.669	0.635 (0.297–1.359)	0.242
<i>Contraindication</i> (sum scores on contraindications to breastfeeding)	2.009 (1.142–3.859)	0.017	3.624 (1.207–10.878)	0.022 ^a
<i>Significance</i> (sum scores on beliefs about breastfeeding)	1.540 (0.778–3.050)	0.216		
<i>Relationship</i> (sum scores on importance of relationship on breastfeeding)	0.913 (0.423–1.969)	0.816		

^aIn the adjusted model, statistical significance <0.05. Cox & Snell *R* squared 0.344

The beliefs about breastfeeding ("significance" in Table 3) were more positive among female than male GPs. From a maximum sum score of 4, the mean sum scores for the belief question "significance" were 2.11 (SD 0.88) for female GPs and 1.70 (SD 0.79) for male GPs ($p = 0.049$). The other sum scores for "social", "cosmetics", and "relationships" did not differ significantly between men and women.

The need to learn about breastfeeding in medical school was confirmed by 85% (57/67) of GPs, whereas 15% (10/67) considered this to be specialized knowledge that could be taught after medical school to those engaged in mother–child care. Two GPs did not reply to this question.

Sixty-eight percent (19/28) of the female and 42% (17/41) of the male GPs considered themselves to have a strong influence as breastfeeding advisors before delivery, compared to 96% (27/28) and 61% (25/41), respectively, after delivery.

The attitude to own guidance after delivery was significantly associated with knowledge about contraindications to breastfeeding (Table 4).

Discussion

In this cross-sectional questionnaire-based survey among GPs in Norway, the respondents expressed beliefs favouring breastfeeding. However, only half of the knowledge questions were answered correctly by the group, even though the majority considered such knowledge basic. They agreed that this topic should be taught in medical school.

More female GPs considered breastfeeding to be important for both the child and mother, and possessed better knowledge than their male colleagues about situations where breastfeeding is contraindicated. In general, the GPs assessed their role as an advisor as more important after delivery than during

pregnancy. After birth, greater confidence was associated with greater breastfeeding knowledge.

Strengths and weaknesses

To our knowledge, this is the first study concerning beliefs and knowledge about breastfeeding among Scandinavian GPs.

The response rate for the GPs was not optimal; only 69 out of 122 GPs (57%) participated. However, the response rate was high compared to other studies involving GPs.[13,14] More female than male GPs responded. This might be caused by selection bias for GPs with good knowledge about breastfeeding. Female GPs in this study performed better than male GPs on knowledge questions.

The questionnaire was developed for this study to accommodate the latest evidence on the benefits of breastfeeding (reviewed in [5,15,16]). It was piloted but not validated, thus some uncertainties on interpretations of questions may reside.

Findings in relation to existing studies

Knowledge and beliefs

Most GPs did not consider breast milk superior to formula in terms of nutrition and long-term health effects. This belief is not consistent with the present evidence in the updated systematic review by the WHO [15] and Nordic Nutrition Recommendations.[16]

One possible explanation may be that doctors living in Norway do not experience the contrast between breastfed and formula-fed children, as most children are breastfed initially, 99% and still 95% are breastfed at two weeks.[1,4] Also, the general health in the population is good, as reflected by the low child mortality rate.[17]

Only half of the knowledge items were answered correctly. This finding is in agreement with previous studies in other countries that identified significant deficits in breastfeeding knowledge among doctors in general practice or other primary care roles.[13,18,19] Formal breastfeeding curriculum can improve physicians' knowledge and attitudes, and possibly breastfeeding rates.[20] The GPs acknowledged, however, the importance of breastfeeding to protect the child from infections and possibly from allergies, and the mother against breast cancer. The protective effect of breast milk against allergies has been downplayed lately,[16] but was still ranked high among the GPs in this survey. Only about one-third associated human milk with cognitive development. This was surprising in light of the

many studies that have indicated such a positive association.[15,16]

According to national recommendations, breastfeeding may be allowed 3 hours after the intake of one unit of alcohol.[21] Many of the GPs continue to give strict advice against alcohol ingestion during lactation. Surprisingly, less than half of the doctors advised against breastfeeding if a mother is HIV positive. In developed countries, HIV positive mothers are advised against breastfeeding. This contrasts to advice given to mothers in developing countries, where the risks of morbidity and mortality due to poor hygiene exceed the risk of HIV-transmission through breast milk.[22] Few GPs have experience with HIV positive mothers in Norway, and some GPs may have interpreted the question as relating to developing countries. A large proportion of GPs in this study considered the use of zopiklon for insomnia or SSRI for depression a reason to stop breastfeeding although these medicines are safe to use during lactation. One probable explanation is that they frequently consult The Industry Formulary, which generally advises against drug use during lactation, instead of consulting The Public Formulary, which gives evidence-based information on these matters. Few GPs in this study recognized *Staphylococcus aureus* as the most frequent agent causing mastitis. The promotion of national guidelines for treating infections in primary care, which focus on resistance of *S. aureus* to penicillin, is needed.[23] Breasts change during and after pregnancy, but this cannot be attributed only to breastfeeding.[24] More than half of the GPs, both males and females, considered breastfeeding to impair the breasts cosmetically. This misconception may be based on unquestioning acceptance of popular beliefs.

Despite partial lack of knowledge, GPs in this study expressed positive breastfeeding beliefs. Positive beliefs are also found among GPs in other studies.[13,25,26] The influence of a woman's mother, mother-in-law, or female friends on the decision to breastfeed was valued by most GPs, as found in another study.[8]

Confidence as advisor

The GPs in the present survey rated their competence higher than did Canadian residents in family medicine,[27] and they perceived their influence on breastfeeding practice to be more important after delivery than during pregnancy. However, many women decide on breastfeeding during pregnancy and are especially receptive to advice received during this period.[28]

As most Norwegian mothers initiate breastfeeding, advice given during pregnancy might not influence initiation, rather the degree and duration of the breastfeeding period. Female GPs possessed more confidence in their own ability to counsel than their male colleagues. Some studies have found that female doctors feel more confident in the role as breastfeeding advisors, whereas others have not found differences in gender.[13,29] There was a significant association between confidence as advisor for sustained breastfeeding and knowledge about contraindications to breastfeeding. However, other studies could not identify similar associations,[19] or it was only identified for female doctors.[30]

In a corresponding Australian study, knowledgeable doctors had more positive attitudes and confidence in guiding women on breastfeeding. However, a positive attitude by itself was not necessarily associated with more confidence. A high level of knowledge might be more important than attitude for achieving greater confidence [13]. Relationships between doctors' breastfeeding attitudes, knowledge, and confidence have not been studied extensively, and the results so far seem contradictory.[25,31]

Consequences for practice

Knowledge about the benefits of breastfeeding for infant and maternal health was partly inadequate among participating GPs from Norway.

To increase the level of knowledge, information about the qualities of human milk and breastfeeding should be conferred both at medical school as well as during postgraduate medical education. By increasing the level of knowledge, the GPs confidence as advisors would probably improve correspondingly. Since they frequently participate in antenatal care they have an important impact on breastfeeding.

Conclusion

GPs in this study appeared to have beliefs favouring breastfeeding, but they partly lacked adequate knowledge to counsel women. Most GPs considered knowledge of breastfeeding to be basic, and represent a topic that should be taught during the medical curriculum. They evaluated their own counselling ability as more important after delivery than during pregnancy.

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