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CLINICAL & BASIC RESEARCH

Exclusive Breastfeeding
Barrier analysis amongst Omani mothers

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abstract: ***Objectives:*** This study aimed to examine individual barriers and supports to exclusive breastfeeding (EBF) and identify potential policy and programmatic interventions in Oman, where less than a quarter of Omani infants under six months are exclusively breastfed. ***Methods:*** A cross-sectional barrier analysis (BA) was carried out among a purposive sample of Omani women who were selected and interviewed by trained enumerators in health clinics in various parts of the country. A BA tool, adapted for the Omani context, covered 12 common determinants of behaviour adoption using open-ended questions regarding participants' perceptions about EBF including positive and negative consequences, self-efficacy and social norms. Qualitative analysis involved coding and tabulating as well as thematic analysis. ***Results:*** This study included a total of 45 'doers' (who exclusively breastfed their infants) and 52 'non-doers' (who did not). Mothers reported that motivations for EBF include the perception that it leads to healthier children and is easy to do, readily available and therefore convenient, as well as that there is an high level of family support for breastfeeding. Barriers included perceived milk insufficiency and mother's employment. ***Conclusion:*** To achieve the EBF target of 50% for 2025, public health action should focus on emphasising the benefits and convenience of EBF and building women's confidence in their ability to produce sufficient milk. These efforts will require increasing the knowledge and skills of community and healthcare workers and establishing monitoring mechanisms. Extended paid maternity leave and supportive workplace policies are necessary to encourage working women to exclusively breastfeed.

Keywords: Breast Feeding; Exclusive Breast Feeding; Health Promotion; Nutrition Policy; Oman.

Advances in Knowledge

- *Incentives to exclusively breastfeed for Omani women include the perception that it leads to healthier children and that it is easy to do, readily available and therefore convenient.*
- *Barriers to exclusively breastfeed include perceived milk insufficiency, employment of mothers and limited familial support.*
- *Creating an enabling environment for exclusive breastfeeding in Oman involves scaling-up existing programmes that vigilantly seek to remove the identified barriers and shape messages that emphasise the benefits of breastfeeding for both the infant and mother, the convenience and the ability of women to produce sufficient mother's milk for their infants.*

Applications to Patient Care

- *Key messages for promoting exclusive breastfeeding include that it is easy to do, readily available and convenient. Efforts should be made to affirm women's ability to produce sufficient milk for their infants and target both mothers of young infants and their families.*
- *Existing programmes such as the Community Support Group and the World Health Organization Baby Friendly Hospital initiatives should continue to engage in individual and group counselling, immediate breastfeeding support following delivery and lactation management; renewed efforts to increase knowledge and skills of health professionals and community volunteers would ensure their sustainability.*

Exclusive breastfeeding (EBF), where infants are given only mother's milk during the first six months of life and no other food or water, is a key intervention with major impact on child mortality and morbidity.[1] Mother's milk contains all the required nutrients for an infant's first six months of life. It provides infants the immunity to diseases through maternal antibodies and increases intelligence; breastfed infants are also less likely to be overweight and less prone to diabetes.[1] For women, breastfeeding protects against breast cancer, improves birth spacing and may protect against ovarian cancer and type 2 diabetes.[1,2] An estimated 823,000 child deaths and 20,000 deaths due to breast cancer can be averted annually if all infants are breastfed, including initiation within one hour of birth, exclusively breastfeeding for the full six-month period and then continued breastfeeding.[1]

Less than a quarter of Omani infants under six months of age are exclusively breastfed, markedly less than the World Health Organization (WHO)/United Nations Children Fund (UNICEF) global target for 2025 of at least 50%.[3,4] The low prevalence of exclusive breastfeeding during the first four months of life

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(31.9%) in Oman has not changed in the past 20 years;[3] however, the prevalence of continued breastfeeding beyond 12 months increased from 66.8% in 2000 to 80.0% in 2017.[3] Nevertheless, the decline in early initiation (within one hour of birth)—87.1% and 82.0%—and the current low rate of EBF for the first six months (23.2%) are of concern not only in Oman but also in the region as a whole.[3,5,6]

A wide range of factors, including social and cultural attitudes, marketing of infant formula, health systems and workplace, community settings and individual attitudes, affect whether or not women initiate early breastfeeding and maintain exclusive and continued breastfeeding for up to two years.[2] Barrier analysis, based on the Health Belief Model and the Theory of Reasoned Action, has identified 12 determinants of behaviour: perceived self-efficacy, perceived social norms, perceived positive consequences, perceived negative consequences, perceived action efficacy, access, perceived susceptibility/risk, perceived severity, cues for action, policy, culture and perceived divine will.[7–9] High self-efficacy is a strong predictor of breastfeeding.[10] Social norms and positive or negative consequences, such as support and advice from family and the health system, influence mothers' confidence in breastfeeding.[2] There are numerous reasons for low levels of EBF around the world such as marketing of infant formula, working status, including short maternity leaves, and inadequate support to mothers of young infants which influences mothers' perceptions of sufficiency of maternal milk for breastfeeding and their ability to breastfeed.[2] Although similar evidence is emerging from several countries of the Arabian Gulf, greater understanding is needed to better guide policymakers in addressing the low prevalence of EBF.[3,11–14] Despite a sociocultural environment supportive of breastfeeding, the prevalence of EBF remains low in Oman.[15] Employment, marketing of breast milk substitutes, inadequate health care support and insufficient mother's milk are some of the key barriers identified by women in the Arabian Gulf.[11–14] Although policies and strategies are in place to encourage exclusive breastfeeding, further work is needed if Oman is to achieve the UNICEF/WHO global target of 50% EBF. Therefore, this study aimed to examine individual barriers and supports for EBF and to identify potential policy and programmatic interventions in Oman.

Methods

This descriptive qualitative study design was used to identify factors that prevent or facilitate a preferred behaviour in a target group (i.e. exclusively breastfed infants aged 0–6 months).[16] Using the barrier analysis (BA) methodology, 12 determinants of a desired behaviour were examined: perceived self-efficacy, perceived social norms, perceived positive consequences, perceived negative consequences, perceived action efficacy, access, perceived susceptibility/risk, perceived severity, cues for action, policy, culture and perceived divine will.[9] Defining the assessed behaviour is an essential step in a BA study; the defined behaviour was that mothers of children 0–6 months should feed their children only mother's milk.

Face-to-face interviews based on a BA assessment tool were conducted in the Ministry of Health (MoH) primary healthcare clinics in five governorates from 10–14 March 2019. A 5-day training programme covering change theory, effective interviewing techniques, a thorough review of the data collection tool, a pre-test and data entry was completed prior to the fieldwork to ensure high-quality results.

To assess EBF, Omani mothers with infants aged 4–9 months were recruited for the study through purposive sampling methods. While four months was identified as the lower age limit to capture as many 'doers' as possible, the upper limit was determined as nine months to minimise recall bias. In order to identify a sufficient number of doers, the BA methodology allowed researchers to 'relax a behaviour'; thus, doers were defined as mothers who exclusively breastfed their infants for the first four months of life rather than the recommended six months of EBF.[4] Recruitment was monitored using an Excel sheet until the recommended number of respondents was reached.

The enumerators, identified by the health management team in each region, were healthcare workers with qualitative research experience. Prior to conducting the survey, 22 enumerators including 19 women and three men from five governorates (Muscat, Al Dakhilyah, Dhofar, North Ash Sharqiya and South Al Batinah) and the MoH nutrition team (six people) were trained in Muscat for five days on the BA methodology and interviewing skills. The training took place from 3–7 March 2019. All enumerators were required to have key qualifications with an average score of 90% or greater on the Quality Improvement Verification Checklist during training prior to the fieldwork.

The BA questionnaire consisted of two sections: items to screen/classify respondents as doers or non-doers and items to assess barriers and supports based on their classification. The BA included six open-ended questions, one question for perceived positive and negative consequences and two questions each for perceived self-efficacy and perceived social norms [Table 1]. Questions on perceived access, cues for

Table 1: Barrier analysis assessment tool used on women who exclusively breastfed and those who did not

Doers	Non-doers
Perceived self-efficacy	
1a. What makes it easy for you to give only breast milk to your baby from birth to six months? [Probe]	1b. What would make it easier for you to give only breast milk to your baby from birth to six months? [Probe]
2a. What makes it difficult for you to give only breast milk to your baby from birth to six months? [Probe]	2b. What would make it difficult for you to give only breast milk to your baby from birth to six months? [Probe]
Perceived positive and negative consequences	
3a. What are the advantages of only giving breast milk to your baby from birth to six months? [Probe]	3b. What would be the advantages of only giving breast milk to your baby from birth to six months? [Probe]
4a. What are the disadvantages of only giving breast milk to your baby from birth to six months? [Probe]	4b. What would be the disadvantages of only giving breast milk to your baby from birth to six months? [Probe]
Perceived social norms	
5a. Who are all of the people that approve of you only giving breast milk to your baby from birth to six months? [Probe]	5b. Who are all of the people that would approve of you only giving breast milk to your baby from birth to six months? [Probe]
6a. Who are all of the people that disapprove of you only giving breast milk to your baby from birth to six months? [Probe]	6b. Who are all of the people that would disapprove of you only giving breast milk to your baby from birth to six months? [Probe]
Perceived access	
7a. How difficult is it for you to get the support you need to give only breast milk to your baby from birth to six months old? Would you say that it is very difficult, somewhat difficult or not difficult at all? A. Very difficult B. Somewhat difficult C. Not difficult at all	7b. How difficult would it be to get the support you need to give only breast milk to your baby from birth to six months? Would you say that it would be very difficult, somewhat difficult or not difficult at all? A. Very difficult B. Somewhat difficult C. Not difficult at all
Perceived cues for action/reminders	
8a. How difficult is it to remember to give only breast milk to your baby from birth to six months? Would you say that it is very difficult, somewhat difficult or not difficult at all? A. Very difficult B. Somewhat difficult C. Not difficult at all	8b. How difficult would it be to remember to give only breast milk to your baby from birth to six months? Would you say that it would be very difficult, somewhat difficult or not difficult at all? A. Very difficult B. Somewhat difficult C. Not difficult at all
Perceived susceptibility/risk	
9. How likely is it that your baby will become malnourished in the next year? Would you say that it is very likely, somewhat likely or not likely at all? A. Very likely B. Somewhat likely C. Not likely at all	
Perceived severity	
10. How serious would it be if your baby became malnourished? Would you say that it would be very serious, somewhat serious or not serious at all? A. Very serious B. Somewhat serious C. Not serious at all	
Action efficacy	
11. How likely is it that your baby will become malnourished if you give only breast milk to your baby for the first six months? Would you say that it is very likely, somewhat likely or not likely at all? A. Very likely B. Somewhat likely C. Not likely at all	
Perception of divine will	
12. Does Islam approve of mothers giving only breast milk to their babies for the first six months? A. Yes B. No C. Not sure	

Table 1 (cont'd.): Barrier analysis assessment tool used on women who exclusively breastfed and those who did not

Doers	Non-doers
Culture	
13. Are there any cultural rules or taboos against only giving breast milk to your baby from birth to six months? A. Yes B. Maybe/I don't know C. No If yes, briefly explain:	
Policy	
14. Are there any teachings, recommendations, policies, laws or regulations that make it more likely that you give only breast milk to your baby from birth to six months? A. Yes B. Maybe/I don't know C. No If yes, briefly explain:	
Universal motivators	
15. Now I'm going to ask you a question that is not at all related to what we have been discussing. What do you want more than anything from life? [Probe]	

action, susceptibility/risk, severity, efficacy, perception of divine will, culture and policy had discrete responses; respondents were encouraged to provide details for the last two areas (culture and policy). Questions varied slightly between doers and non-doers. A question addressing universal motivators, looking at what mothers want more than anything in life, was included since this information is useful when designing promotional campaigns.

The questionnaire was developed and contextualised within the Omani context in English following the standard BA questionnaire design guidelines and then translated into Arabic. It was then validated by the MoH nutrition team and enumerators during training by conducting a pilot test with 27 doers and non-doers to ensure clarity for each question in the local Arabic dialect.

A total of 22 trained enumerators approached each potential participant at a health clinic, found a semi-private place to conduct a face-to-face interview, introduced the study and obtained informed consent. Eligible women who consented to be part of the study were then screened to determine their status as a doer or a non-doer before proceeding with the survey interview. During the interview, enumerators were encouraged to probe participants to prompt them for further details, if needed.

Completed questionnaires were scanned and sent via email to the MoH nutrition team in Muscat. Qualitative analysis involved coding, tabulating and thematic analysis of the data by the central nutrition team. Once responses were coded and tabulated, they were entered into a BA tabulation sheet to calculate the estimated relative risk (RR) and odds ratios for identifying significant differences between doers and non-doers using "yes" responses as the reference.[9] For barrier analysis, an estimated RR is the preferred approach to presenting findings as it provides more accurate estimates of association.[9] A significant *P* value of less than 0.05 was determined, with a confidence interval of 95%.

The research protocol of this study was approved by the UNICEF Ethical Review Board.

Results

A total of 97 women (45 doers and 52 non-doers) in the five governorates were interviewed. The thematic determinants that emerged during the interviews varied significantly between doers and non-doers across the six areas studied: perceived self-efficacy, perceived social norms, perceived positive and negative consequences, perceived action efficacy and universal motivator [Table 2].

The reasons for the importance of EBF as provided by doer and non-doer mothers were statistically similar. A mother's availability to breastfeed and not have difficulties in breastfeeding and the benefits to a child's health, including the immune system and growth and development, were the most common reasons. To examine the belief in the ability to do a particular behaviour, respondents were asked, 'What makes it (or what would make it) easier or more difficult for you to exclusively breastfeed your baby for the first six months of life?' Doers were 5.42 times (P = 0.018) more likely than non-doers to say, 'It is easy because I think it is important' and 2.84 times (P = 0.011) more likely than non-doers to say, 'It is

Table 2: Determinants of exclusive breastfeeding among Omani Women (N = 97)

Emerging thematic determinants	n (%)*		Difference between doers and non-doers in %	Odds ratio (95% CI)	Estimated relative risk	*P* value
	Doers (n = 45)	Non-doers (n = 52)				
1. Self-Efficacy: What makes it easier?						
Breast milk is available, ready and requires no preparation.	17 (37.8)	8 (15.4)	22.4	3.34 (1.27–8.76)	2.84	0.011
I think it is important (not specified).	7 (15.6)	1 (1.9)	13.7	9.39 (1.11–79.61)	5.42	0.018
If I deliver the baby easily and have good health	0 (0.0)	6 (11.5)	11.5	0.00	0.00	0.021
I do not have any problems with breastfeeding or positioning the baby for feeding.	6 (13.3)	11 (21.2)	7.9	0.57 (0.19–1.70)	0.60	0.230
It helps with the baby's growth and development	6 (13.3)	6 (11.5)	1.8	1.18 (0.35–3.95)	1.16	0.514
I know that it improves my baby's immune system, keeps him from getting illnesses.	7 (15.6)	8 (15.4)	0.2	1.01 (0.34–3.05)	1.01	0.600
I am available and free to breastfeed my child any time.	12 (26.7)	14 (26.9)	0.2	0.99 (0.40–2.43)	0.99	0.581
2. Self-Efficacy: What makes it difficult?						
It is not difficult.	18 (40.0)	2 (3.8)	36.2	16.67 (3.59–77.28)	8.27	<0.001
There is not enough milk, especially in the beginning.	5 (11.1)	17 (32.7)	21.6	0.26 (0.09–0.77)	0.28	0.010
I work outside of the home.	3 (6.7)	13 (25.0)	18.3	0.21 (0.06–0.81)		
I have to be away from home, and there is no place to breastfeed.	11 (24.4)	4 (7.7)	16.7	3.88 (1.14–13.23)	3.13	0.023
Sometimes the baby does not want to nurse or take my breast milk from a bottle.	7 (15.6)	14 (26.9)	11.3	0.50 (0.18–1.38)	0.53	0.134
I have problems with my breasts or nipples (painful, swollen, cracked or inverted nipples).	10 (22.2)	14 (26.9)	4.7	0.78 (0.31–1.97)	0.79	0.384
I have too many things to do so I get busy and tired.	7 (15.6)	6 (11.5)	4.1	1.41 (0.44–4.56)	1.36	0.388
3. Perceived positive consequences: What are the advantages?						
It helps the mother lose the weight gained during the pregnancy.	11 (24.4)	4 (7.7)	16.7	3.88 (1.14–13.23)	3.13	0.023
It is safe for the child to drink and doesn't cause side effects or allergies.	9 (20.0)	4 (7.7)	12.3	3.00 (0.86–10.52)	2.55	0.070
It helps with brain development of the child and makes him intelligent.	6 (13.3)	11 (21.2)	7.9	0.57 (0.19–1.70)		
It improves the health of the mother and protects from illnesses.	9 (20.0)	7 (13.5)	6.5	1.61 (0.55–4.74)	1.52	0.277
It decreases the chance that the mother will get cancer.	4 (8.9)	7 (13.5)	4.6	0.63 (0.17–2.30)	0.65	0.352
It delays pregnancy; good for birth spacing.	9 (20.0)	9 (17.3)	2.7	1.19 (0.43–3.33)	1.17	0.467
It improves weight and the immunity of the baby and keeps him healthy.	43 (95.6)	49 (94.2)	1.4	1.32 (0.21–8.25)	1.28	0.569
It increases the bonding between mother and child.	7 (15.6)	8 (15.4)	0.2	1.01 (0.34–3.05)	1.01	0.600
4. Perceived negative consequences: What are the disadvantages?						
The baby does not get enough milk and is not satisfied and then loses weight.	0 (0.0)	9 (17.3)	17.3	0.00	0.00	0.003

CI = confidence interval.
**Reference is "yes".*

Table 2 (cont'd.): Determinants of exclusive breastfeeding among Omani Women (N = 97)

Emerging thematic determinants	n (%)*		Difference between doers and non-doers in %	Odds ratio (95% CI)	Estimated relative risk	*P* value
	Doers (n = 45)	Non-doers (n = 52)				
There are no disadvantages/I don't know.	29 (64.4)	30 (57.7)	6.7	1.33 (0.58–3.02)	1.29	0.319
The child becomes too attached to me, and then I cannot leave him to do other things I need to do.	6 (13.3)	5 (9.6)	3.7	1.45 (0.41–5.10)	1.39	0.398
5. Perceived social norms: Who approves?						
Husband	39 (86.7)	36 (69.2)	17.5	2.89 (1.02–8.19)	2.66	0.034
Mother	35 (77.8)	32 (61.5)	16.3	2.19 (0.89–5.37)	2.04	0.065
Sister	19 (42.2)	29 (55.8)	13.6	0.58 (0.26–1.30)	0.61	0.130
Mother-in-law	14 (31.1)	12 (23.1)	8.0	1.51 (0.61–3.71)	1.44	0.254
Sisters-in-law	7 (15.6)	11 (21.2)	5.6	0.69 (0.24–1.95)	0.71	0.330
Doctors, nurses and health workers	6 (13.3)	9 (17.3)	4.0	0.74 (0.24–2.25)	0.76	0.400
6. Perceived social norms: Who disapproves?						
My mother	3 (6.7)	7 (13.5)	6.8	0.46 (0.11–1.89)	0.49	0.225
My sisters	7 (15.6)	5 (9.6)	6.0	1.73 (0.51–5.89)	1.62	0.281
No one	20 (44.4)	20 (38.5)	5.9	1.28 (0.57–2.88)	1.25	0.348
My sisters-in-law	6 (13.3)	9 (17.3)	4.0	0.74 (0.24–2.25)	0.76	0.400
My friends	5 (11.1)	8 (15.4)	4.3	0.69 (0.21–2.27)	0.71	0.378
7. Perceived access: How difficult is it to get the support you need to EBF?						
Very difficult	0 (0.0)	4 (7.7)	7.7	0.00	0.00	0.078
Somewhat difficult	6 (13.3)	16 (30.8)	17.5	0.35 (0.12–0.98)	0.38	0.034
Not difficult at all	39 (86.7)	32 (61.5)	25.2	4.06 (1.46–11.32)	3.65	0.005
8. Perceived cues for action: How difficult is it to remember to give your baby only breast milk?						
Very difficult	1 (2.2)	1 (1.9)	0.3	1.16 (0.07–19.08)	1.14	0.715
Somewhat difficult	4 (8.9)	9 (17.3)	8.4	0.47 (0.13–1.63)	0.49	0.181
Not difficult at all	40 (88.9)	42 (80.8)	8.1	1.90 (0.60–6.06)	1.81	0.207
9. Perceived susceptibility/risk: How likely is it that your baby will become malnourished in the coming year?						
Very likely	3 (6.7)	0 (0.0)	6.7		10.64	0.096
Somewhat likely	11 (24.4)	21 (40.4)	16.0	0.48 (0.20–1.15)	0.51	0.073
Not likely at all	31 (68.9)	30 (57.7)	11.2	1.62 (0.70–3.75)	1.55	0.177
10. Perceived severity: How serious would it be if your child became malnourished?						
Very serious	18 (40.0)	25 (48.1)	8.1	0.72 (0.32–1.61)	0.74	0.277
Somewhat serious	22 (48.9)	22 (42.3)	6.6	1.30 (0.58–2.91)	1.27	0.328
Not serious at all	5 (11.1)	5 (9.6)	1.5	1.18 (0.32–4.35)	1.16	0.534
11. Action efficacy: How likely is it that your child will become malnourished if you feed him only breast milk to six months?						
A. Very likely	1 (2.2)	4 (7.7)	5.5	0.27 (0.03–2.53)	0.30	0.229
B. Somewhat likely	7 (15.6)	18 (34.6)	19.0	0.35 (0.13–0.93)	0.38	0.027
C. Not likely at all	37 (82.2)	30 (57.7)	24.5	3.39 (1.32–8.70)	3.06	0.008

CI = confidence interval.
**Reference is "yes".*

Table 2 (cont'd.): Determinants of exclusive breastfeeding among Omani Women (N = 97)

Emerging thematic determinants	n (%)*		Difference between doers and non-doers in %	Odds ratio (95% CI)	Estimated relative risk	*P* value
	Doers (n = 45)	Non-doers (n = 52)				
12. Perception of Divine Will: Does Islam approve of giving only breast milk?						
A. Yes	40 (88.9)	43 (82.7)	6.2	1.67 (0.52–5.42)	1.60	0.284
B. Maybe	1 (2.2)	4 (7.7)	5.5	0.27 (0.03–2.53)	0.30	0.229
C No	4 (8.9)	5 (9.6)	0.7	0.92 (0.23–3.64)	0.92	0.592
13. Culture: Are there any taboos or myths that prevent women from practicing the behaviour?						
A. Yes	8 (17.8)	7 (13.5)	4.3	1.39 (0.46–4.19)	1.34	0.379
B. Maybe	0 (0.0)	0 (0.0)	0.0			1.000
C. No	37 (82.2)	45 (86.5)	4.3	0.72 (0.24–2.17)	0.75	0.379
14. Policy: Are there any laws or regulations that make it more likely women will exclusively breastfeed?						
A. Yes	30 (66.7)	30 (57.7)	9.0	1.47 (0.64–3.36)	1.41	0.243
B. Maybe	3 (6.7)	3 (5.8)	0.9	1.17 (0.22–6.09)	1.15	0.590
C. No	12 (26.7)	19 (36.5)	9.8	0.63 (0.26–1.51)	0.66	0.206
15. Universal motivators						
Happiness and peace	5 (11.1)	15 (28.8)	17.7	0.31 (0.10–0.93)	0.34	0.027
To be a good mother and raise good children.	12 (26.7)	5 (9.6)	17.1	3.42 (1.10–10.63)	2.85	0.026
To please God	7 (15.6)	6 (11.5)	4.1	1.41 (0.44–4.56)	1.36	0.388
Money and financial stability/a good job or source of income	11 (24.4)	11 (21.2)	3.2	1.21 (0.47–3.12)	1.18	0.442
Health for myself and my family	29 (64.4)	34 (65.4)	1.0	0.96 (0.42–2.21)	0.96	0.546
A good education and future for my children	11 (24.4)	13 (25.0)	0.6	0.97 (0.38–2.45)	0.97	0.570
A house	6 (13.3)	7 (13.5)	0.2	0.99 (0.31–3.19)	0.99	0.612

CI = confidence interval.
**Reference is "yes".*

easy because breast milk is available and ready for the child and requires no preparation'. Non-doers were 4.2 (1/0.24) times (P = 0.014) more likely to say than doers, 'It is difficult (to exclusively breastfeed) because I work outside the home'. In addition, non-doers were 3.6 (1/0.28) times (P = 0.010) more likely than doers to say, 'It is difficult when there is not enough milk, especially in the beginning'.

The most common perceived positive consequence of EBF among all respondents was related to the child's health and well-being. Other common responses among both groups included delays in pregnancy and mother's health. Doers were 10.88 times (P = 0.043) more likely than non-doers to say, 'I can save money and time because it is free, easy, and takes no time to prepare' and 3.13 times (P = 0.023) more likely to say

than non-doers, 'It helps the mother lose the weight gained with the pregnancy'. Nearly 20% of non-doers responded, 'The baby does not get enough milk and is not satisfied and then loses weight'—a concern not expressed by doers.

The social norms determinant refers to an individual's perception of the approval or disapproval of EBF by people considered to be important in an individual's life. Respondents were asked who approves or disapproves of them exclusively breastfeeding their child for the first six months of life. Doers were 2.66 times (P = 0.034) more likely than non-doers to respond, 'My husband approves of me only giving breast milk to my baby for the first six months' and 2.04 times (P = 0.065) more likely than non-doers to respond, 'My mother approves of me only giving breast milk to my baby for the first six months'. On the other hand, the access determinant has many different facets; it includes the degree of availability of the needed products or services required to adopt a behaviour. Respondents were asked how difficult it was (or would it be) to get the support needed to exclusively breastfeed. Non-doers were 2.6 (1/0.38) times (P = 0.034) more likely than doers to say, 'It is somewhat difficult to get the support I need to give only breast milk to my baby for the first six months'.

To examine the existence of belief that a behaviour will help avoid certain problems, respondents were asked about the likelihood of an infant becoming malnourished if breastfed exclusively. Non-doers were 2.6 (1/0.38) times (P = 0.027) more likely than doers to say, 'It is somewhat likely that my child will become malnourished if I give him only breast milk to six months of age', demonstrating that non-doers express doubt about the benefit of EBF in order to protect children from malnourishment.

Respondents were asked what they wanted more than anything in life, to identify the key factors that motivate most people, irrespective of other variables. Family health and children's education were common universal motivators among both doers and non-doers. Non-doers were 2.9 (1/0.34) times (P = 0.027) more likely than doers to say, 'I want happiness and peace more than anything from life'.

Discussion

This study identified barriers and supports for EBF in Oman. Incentives for exclusive breastfeeding include the perception that it leads to healthier children and, being easy and readily available, is convenient. Furthermore, the support from husbands and mothers was noted as necessary for successful breastfeeding. Barriers to EBF included perceived milk insufficiency, mother's employment and limited family support. Despite the considerable knowledge about the benefits of breastfeeding to both the mother and child, the barriers identified that there are low rates of EBF in Oman. Similar barriers have been described globally and in the neighbouring countries.[11–14,17,18]

Individual experiences play a major role in determining whether or not a mother exclusively breastfeeds her infant. The perception of insufficient milk supply mentioned by participants in this study as well as other studies in this region is an important reason women have stopped exclusively breastfeeding during their infant's first six months and/or introduced formula or weaning food.[12–14,18,19] For example, more than half of a study's participants in Saudi Arabia and one-in-three study participants in Qatar discontinued breastfeeding due to their perception of lack of sufficient mother's milk.[14,19] Breastfeeding difficulties and the perception that the crying of an infant indicates hunger in the early weeks undermine a mother's confidence, making her assume that she has insufficient milk and, thus, leading her to introduce infant formula.[2] Encouraging new mothers to exclusively breastfeed requires building confidence in their ability to produce sufficient milk for their infants.

The participants of this BA study highlighted the importance of family support in promoting infant feeding practices: doers were almost four times as likely to believe that it was not difficult to get support compared with the non-doers. Although traditional culture is supportive of breastfeeding, older female family members have a great influence on mothers' breastfeeding practices, especially new mothers unfamiliar with breastfeeding.[12,13] Researchers from the region have shown that some grandmothers and fathers are supportive of EBF, while others may advise introducing water, formula or other food.[11–13] Although infant formulas were not frequently mentioned in the current study, their marketing is ubiquitous in the region and are undermining efforts to improve breastfeeding, including women's own ability to breastfeed.[2,13,14,19–21] Although stronger regulations were enacted in May 2021 that aligned to the code for marketing infant formula, research to examine the influence of infant formulas on EBF in Oman would be useful, especially on new mothers and their circle of family support.[22–24]

Oman has introduced several intervention programmes to promote breastfeeding, including the Community Support Group Programme, lactation counsellors for the WHO Multicentre Growth Reference Study and the WHO Baby

Friendly Hospital Initiative.[20,25,26] Strengthening these programmes through the inclusion of individual and group counselling, immediate breastfeeding support following delivery and lactation management will require renewed efforts to increase knowledge and skills of health professionals and community volunteers, greater monitoring and ensuring sustainability of current interventions to promote breastfeeding.[2,5] These programmes should address the key barriers identified in this BA by emphasising the benefits and convenience of EBF to both the infant and mother, building women's confidence in producing sufficient milk for their infants and communicating how EBF can contribute to a happy and peaceful life.

Mothers' employment is a major barrier to EBF in Oman. Globally, it is a critical factor that influences women's decisions to initiate breastfeeding, exclusively breastfeed and continue breastfeeding into the second year.[2] Approximately one-quarter of the Omani workforce are women and this is expected to increase.[27,28] Although Oman has maternity leave allowance, it does not meet the minimal standard of 14 weeks recommended by the International Labour Organization.[28,29] Mothers are unable to adhere to EBF due to the short leave, the lack of child care and the challenges of expressing milk; according to a widely cited study in the United Arab Emirates, two-thirds of its participants did not exclusively breastfeed their infants for six months due to short maternity leave.[2,13] Al Nuaimi *et al*. mention employment as a key factor for low breastfeeding rates in the Arabian Gulf.[20] Reducing barriers for working mothers by extending maternity leave and providing lactation rooms and nursing breaks can improve breastfeeding rates and workforce performance.[2,11,13,20]

The results of this research are being used to strengthen the breastfeeding promotion programme within the MoH through determining the key messages for a nation-wide exclusive breastfeeding campaign, sharing findings with the staff working in the maternal and child health and health education programmes so that they can strengthen EBF promotion within their own programmes and using it for the training of lactation consultants currently working in secondary hospitals. The findings are also being used to advocate strengthening of family-friendly policies so as to be more supportive of EBF, a key barrier identified in this study.

This study used a verified methodology and included respondents from the governorates where a majority of the Omani population reside.[9] More non-doers were recruited from the southernmost governorate due to the extremely low level of breastfeeding in that governorate while additional doers were recruited from the other four governorates. It provides a broad overview of the most common determinants of breastfeeding in the country. However, a more focused study on the southern province would be useful to identify more focused interventions. Although the enumerators were rigorously trained and conducted the fieldwork, coding was carried out by the Nutrition Core Team, which may have led to some margin of error of interpretation. While the sample size was small, participants were from various regions of the country but the results may not be generalisable to the entire population.

Conclusion

Women in Oman experience similar barriers to breastfeeding as women around the world. Scaling-up existing interventions, policies and programmes requires not only continuing to emphasise the benefits and convenience of EBF but also building women's confidence in their ability to produce a sufficient quantity of milk. These expansions will require increasing the knowledge and skills of community and health-care workers. National campaigns could highlight how EBF contributes to a happy and peaceful life and encourage support from family members. Extending the paid maternity leave period and developing other policies that encourage working women to exclusively breastfeed are also needed.

AUTHORS' CONTRIBUTION

SA-G, SA-M, DC and CA conceptualised the study. SA-G, DC and CA worked on the methodology utilised in the study. DC and CA authored the research tools. IA-G, AA-A, SA-S, RMA-B and FA-M collected the data. All authors were involved in data analysis. SA-M, DC, CA and RMM interpreted the results. SA-M and RMM drafted the manuscript. All authors approved the final version of the manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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