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Barriers and drivers to exclusive breastfeeding in Kyrgyzstan: a qualitative study with mothers and health workers

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Abstract

Background The WHO/UNICEF global nutrition target for exclusive breastfeeding for six months is at least 70% of infants by 2030. However, global prevalence rates are 48% with variations between countries and within regions. Kyrgyzstan has consistently high early breastfeeding initiation rates, yet exclusive breastfeeding for six months is 46%. This qualitative study addressed two research questions: (1) What are the barriers and drivers for mothers to exclusive breastfeeding in the first six months? (2) What are the barriers and drivers for health workers in primary care facilities to supporting exclusive breastfeeding in the first six months?

Methods The study took place from April to June 2023 in five sites (mix of urban and rural). Ten focus group discussions with 40 primary care health workers and 20 in-depth interviews with mothers of a child currently aged 6–12 months who initiated breastfeeding with this child were conducted. Mothers were purposively selected to represent four groups of infant feeding practices in the first six months: (1) exclusive breastfeeding, (2) breastfeeding alongside other fluids/solids, (3) breastfeeding alongside infant formula, (4) breastfeeding followed by switching to formula only. The Capability-Opportunity-Motivation-Behaviour (COM-B) model was the underpinning theoretical framework. Data were analysed using the Framework approach.

Results The study uncovered important misperceptions amongst mothers who were not exclusively breastfeeding (groups 2–4). These existed alongside a perceived inability to resolve physical challenges of breastfeeding and social pressure to supplement breastmilk with fluids/solids or formula. Half of all mothers felt uncomfortable breastfeeding in public. Health workers were recommending and supporting women with exclusive breastfeeding during multiple antenatal and postnatal interactions during the initial six months. They were knowledgeable and motivated to do this. Moreover, they felt well supported with training, resources, and legislation with just a few mentioning workplace time or space challenges. Very few doctors appeared to currently be meeting with formula industry representatives.

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Conclusions This theory-informed qualitative study focusing on mother and health worker perspectives provided important insights into the individual and contextual barriers and drivers to exclusive breastfeeding for the first six months in Kyrgyzstan. These insights have informed recommendations for tailored interventions for both groups.

Keywords Breastfeeding, Infant feeding, Kyrgyzstan, Kyrgyz Republic, Behavioural insights, Qualitative

Background

Breastfeeding is a global public health priority with many health benefits for both the mother and baby [1]. The World Health Organization (WHO) and United Nations Children Fund (UNICEF) recommend (1) early breastfeeding initiation within the first hour of birth, (2) exclusive breastfeeding in the first 6 months (no other foods or liquids are provided including water) and (3) continuing breastfeeding from 6 months to 2 years or beyond (where children eat safe and adequate complementary foods while continuing to breastfeed) [2–4]. Their global nutrition target is for at least 70% of children to be exclusively breastfed in the first 6 months by 2030 [4]. Recent global prevalence rates are 48% [5], and 46% in low- and middle-income countries, with significant variations between countries and within regions [6].

Kyrgyzstan is a land-locked country in Central Asia, bordering China, Kazakhstan, Tajikistan, and Uzbekistan. It is part of the Commonwealth of Independent States (CIS). The population is close to 7 million, with two thirds (64%) living in rural areas [7]. It has a long history of government breastfeeding related policies [8] aligned with the Global Strategy for Infant and Young Child Feeding [9] that calls for political commitment, including implementation, monitoring and evaluation of a comprehensive policy on infant and young child feeding, in the context of national policies and programmes for nutrition, child and reproductive health, and poverty reduction. Kyrgyzstan implemented the Baby-Friendly Hospital Initiative (BFHI) in 2000 [8]. Nearly half (46%) of hospitals in 2023 achieved international BFHI accreditation [10]. The country achieves consistently high early breastfeeding initiation rates, with between 81% [11, 12] to 92% [12] of mothers commencing within one hour of birth, and over 94% [11, 13] within one day of birth. However, prevalence rates for exclusive breastfeeding at 6 months are much lower at 46% [11, 14] far below the target of 70%.

There is an extensive global literature exploring barriers and drivers to breastfeeding, focused predominantly on initiation and exclusive breastfeeding [15–19]. Multiple, inter-related factors consistently operate at the *individual* level e.g. a mother's knowledge of the benefits of exclusive breastfeeding, their beliefs about giving additional fluids or formula, embarrassment about breastfeeding in public, and the *contextual* level, e.g. social norms for infant feeding and availability of breastfeeding support. Importantly health behaviours, like breastfeeding, are complex, context-specific and change over time [20]. This means that current local evidence is needed to develop effective interventions to encourage exclusive breastfeeding. We found just two published studies on breastfeeding with mothers from nearby CIS countries [21, 22] and three published studies from Kyrgyzstan [23–25]. A qualitative study from Armenia [21] identified significant systemic barriers and knowledge deficiencies amongst mothers, whilst a quantitative analysis of medical records in the northwest Russian Federation described socio-demographic determinants of duration of breastfeeding e.g. education and age [22]. Research conducted in Kyrgyzstan is predominantly quantitative [23–25]. It describes good awareness amongst mothers of the benefits of exclusive breastfeeding alongside incorrect beliefs about when a baby should receive additional fluids or solids [23], and mixed opinions on health worker support and influence [24]. Mothers with incomplete secondary education may exclusively breastfeed their children at a lower rate (28.4%) compared to mothers with completed secondary education and above (42.6–49.7%) [11, 12]. There is no evidence of a difference according to family income [11, 12] and no data for other socio-demographic characteristics.

Globally, health workers' recommendations and support are known to play a critical role in mothers' breastfeeding behaviours [6, 18]. Again, both individual and contextual factors play a part in health workers' behaviours. To support infant feeding effectively, health workers need good knowledge of the physiology and anatomy of breastfeeding combined with empathetic communication and practical skills to support with correct positioning and attachment, and breastfeeding problems. However, global evidence shows that many do not receive adequate breastfeeding education and training [26, 27]. Indeed, the above cited study from Armenia [21] found poor knowledge amongst primary and secondary care health workers as well as low motivation associated with low pay and lack of recognition for this work. In Kyrgyzstan, research to date has focused on health workers in maternity hospitals. A case study of the BFHI [28] reported a lack of pre-service (e.g. at university) and regular in-service training for hospital health workers, alongside time constraints, and limited funding and materials to support (all) breastfeeding. Significant knowledge gaps about exclusive breastfeeding were found in a survey of amongst health workers in a regional hospital [24].

Although the above evidence for mothers and health workers provides useful insights for understanding the low rates of exclusive breastfeeding in Kyrgyzstan, in-depth qualitative research with both mothers and primary care health workers focused on exclusive breastfeeding is lacking. Therefore, this qualitative research study aimed to answer two research questions: (1) What are the barriers and drivers for mothers living in urban and rural areas in Kyrgyzstan to exclusive breastfeeding in the first 6 months? (2) What are the barriers and drivers for health workers working in urban and rural primary care facilities to supporting exclusive breastfeeding in the first 6 months? The study was part of an ongoing WHO Tailoring Health Programmes (THP) project [20] that commenced in October 2022. A THP approach supports the use of behavioural and cultural insights to develop tailored interventions. This is a collaboration between the WHO Regional Office for Europe, the Republican Centre of Health Promotion and Mass Communication, Ministry of Health and Kyrgyz State Medical Academy in Kyrgyzstan.

Methods

This cross-sectional, qualitative study was conducted April to June 2023. It was approved by the Scientific and Production Centre for Preventive Medicine of the Ministry of Health of Kyrgyzstan and the WHO Research Ethics Review Committee.

The theoretical framework underpinning the study (and wider THP approach) was the adapted version of the Capability-Opportunity-Motivation-Behaviour (COM-B) model [20, 29, 30]. This identifies three factors that need to be in place for a health behaviour to occur. Capability and motivation are individual factors; opportunity is a contextual factor and is split into two: sociocultural and physical. The factors interact, and motivation is affected by opportunity and capability (see Fig. 1). We used this framework to ensure that all types of individual and contextual influences on exclusive breastfeeding and supporting exclusive breastfeeding were explored.

Setting

The study was conducted in five study sites from two of the country's regions (called oblasts) (Narynskaya, Oshskaya) and the capital city (Bishkek). A rural and urban study site in each oblast were selected: At-Bashy district and Naryn city (Narynskaya oblast); Uzgen district and Kara-Say city (Oshskaya oblast). Bishkek is urban only. Narynskaya and Oshskaya oblasts had the lowest levels of exclusive breastfeeding in the first 6 months in Kyrgyzstan in 2019–2021 [12]. The prevalence in Bishkek was 51.5% [11]. This sampling was designed to identify similarities and differences across the five sites as well as facilitate a rural-urban comparison.

Participants and recruitment

Health workers

Forty primary care health workers who discuss breastfeeding with women as part of their everyday work were recruited from Family Medical Centres (FMC) and Family Group Practices (FGP) in the five study sites (8 per site). In sites with more than four FMC/FGPs, four facilities were randomly selected. Where there was up to four FMC/FGPs in site, all facilities were invited to participate. A Ministry of Health representative emailed the head of the selected health facilities to invite them to nominate up to six health workers (three doctors, three nurses/feldshers) and to share the study information with them. With these health workers' permission, a researcher then emailed/phoned them to recruit one doctor and one nurse/feldsher per health facility. All the invited health facilities and health workers agreed to take part.

Participants were predominantly female (95%), half (50%) were doctors whilst the other half were a mix of nurses (37.5%) and feldshers (12.5%). Combined, their mean age was 47.83 years, and mean number of years since qualifying was 21.83 years (see Table 1).

Mothers

Twenty mothers who had initiated breastfeeding with their child aged 6–12 months were recruited from the same FMCs/FGPs. Flyers were left in waiting rooms and nurses were asked to identify and approach 3–4 mothers about the study to seek verbal permission for their contact details to be shared with the researchers. A researcher then phoned these mothers to describe the purpose of the study, and where willing, recruit them. One mother declined to participate citing the wishes of her husband. Another could not be contacted on the day of the interview. Both were in Oshskaya oblast, and both were replaced.

Purposive convenience sampling was employed to recruit a mix of mothers using four infant feeding practices.

A. Exclusive breastfeeding: the baby only received breastmilk, no other fluids or solids in their first 6 months of life.
B. Breastfeeding and other fluids or solids: the baby received breastmilk and other fluids e.g. water, cow's milk tea or solids e.g. porridge in their first 6 months of life.
C. Breastfeeding and formula: the baby received breastmilk and commercial infant formula in their first 6 months of life.
D. Breastfeeding then switched to formula only: the baby initially received breastmilk, then only commercial infant formula (no more breastmilk).

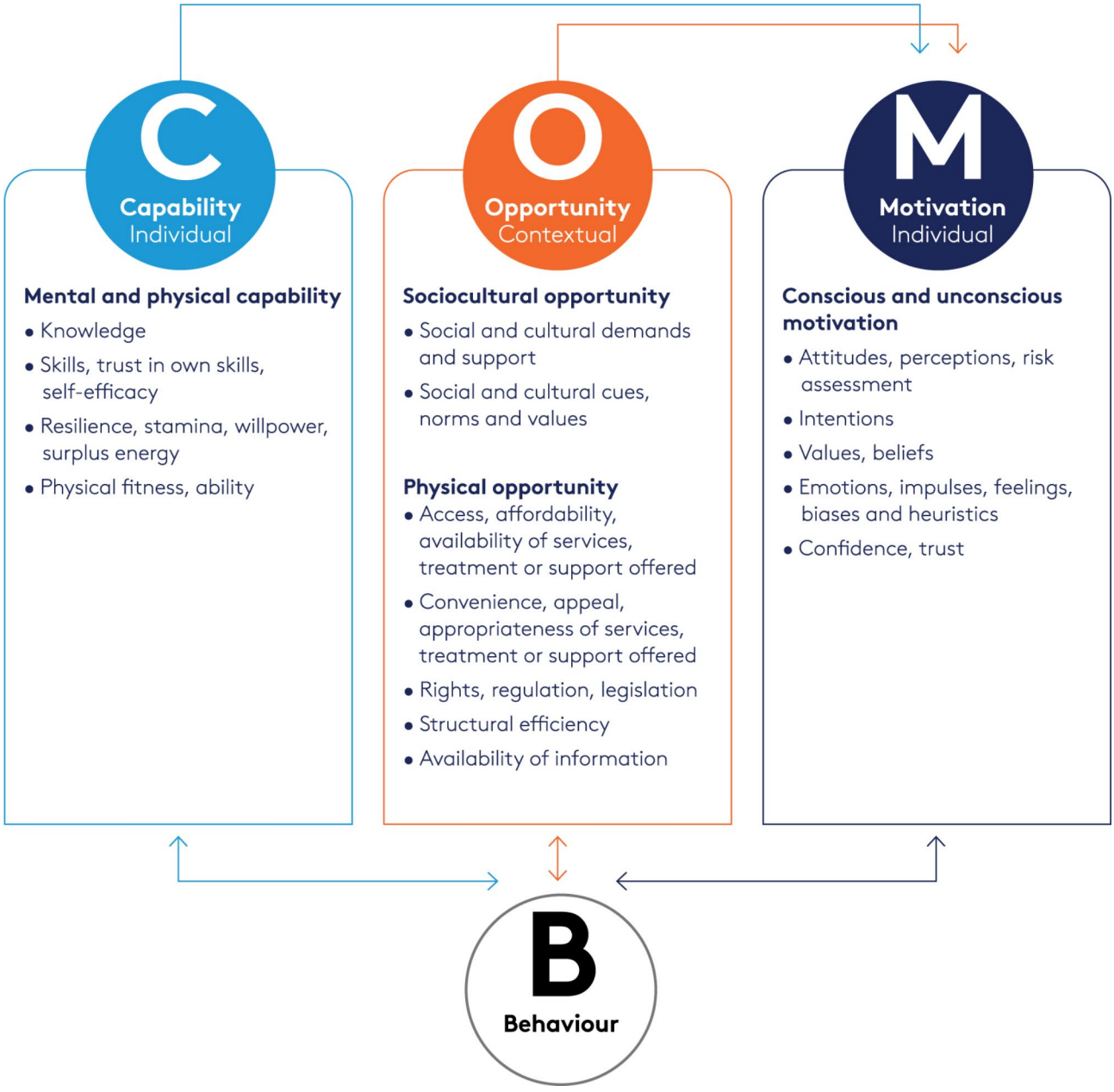

Fig. 1 Adapted COM-B model [20]

The intention was to have an even mix of mothers across four infant feeding practices in each site. However, this proved difficult to do, with more mothers in the exclusive breastfeeding (40%) and combined breastfeeding and formula groups (35%) taking part than the other two groups, and a corresponding imbalance across study sites. This meant that the planned comparisons of barriers and drivers by study site were not possible. There was a mix of education levels amongst the mothers, with all completing general secondary education or above. Their mean age was 30.40 years, and the average number of children was 2.90 (see Table 2).

Data collection

Ten focus group discussions (one with doctors, one with nurses/feldshers in each site) and 20 interviews with mothers (four per site) were conducted face-to-face, in the local language (Kyrgyz) or Russian. The Ministry of Health provided permission for the health workers to attend a central FMC for the focus group during their working hours. Mothers were interviewed in their local health facility. Travel expenses were reimbursed. Before commencing the discussion/interview, all participants gave written informed consent to take part and to be audio-recorded.

Table 1 Study site and demographic characteristics of health worker participants

Study site and demographic characteristic		Number (%)
Narynskaya oblast	Naryn city (urban)	8 (20)
	At-Bashy district (rural)	8 (20)
Oshskaya oblast	Kara-Say city (urban)	8 (20)
	Uzgen district (rural)	8 (20)
Bishkek (capital)	Bishkek city (urban)	8 (20)
Professional role	Family doctor	20 (50)
	Nurse	15 (37.5)
	Nurse/Feldsher	5 (12.5)
Gender	Male	2 (5)
	Female	38 (95)
Age in years (Mean, SD, range)	47.83, 13.61, 25–70	
Number of years since qualified as a health worker (Mean, SD, range)	21.83, 13.69, 1–45	

Note. Feldshers are health workers with higher education medical training who provide medical treatment, often working in rural locations

Table 2 Location, infant feeding practices and demographic characteristics of mothers

Location and demographic characteristic		Number (%)
Narynskayaoblast	Naryn city (urban)	4 (20)
	At-Bashy district (rural)	4 (20)
Oshskaya oblast	Kara-Say city (urban)	4 (20)
	Uzgen district (rural)	4 (20)
Bishkek (capital)	Bishkek city (urban)	4 (20)
Infant feeding practice up to 6 months	A. Exclusive breastfeeding	8 (40)
	B. Breastfeeding and other fluids or solids	4 (20)
	C. Breastfeeding and formula	7 (35)
	D. Breastfeeding then switched to formula	1 (5)
Education	Completed general secondary education	7 (35)
	Completed college	8 (40)
	Completed university	5 (25)
Age in years (Mean, SD, range)	30.40, 4.44, 22–40	
Number of children (Mean, SD, range)	2.90, 1.21, 1–5	

The focus group discussions explored health workers' experience of supporting mothers to do exclusive breastfeeding in the first 6 months. The interviews explored mothers' experience of feeding their child for the first 6 months. Discussion guides (see Additional Files 1 and 2) were used to investigate the individual and contextual barriers/drivers to these two target behaviours, organized by the COM factors [20].

Data analysis

All focus group discussions and interviews were audio-recorded, transcribed verbatim in Kyrgyz or Russian and analysed using Framework approach [31] focusing on identifying barriers and drivers to the two target behaviours (exclusive breastfeeding in the first 6 months for mothers/supporting exclusive breastfeeding for health workers). The data from health workers and mothers were first analysed independently. A thematic framework for each group was developed in Excel based on the discussion guide and ideas generated from one focus group and one interview transcript. The two frameworks were then each piloted with a transcript, before finalising. Summaries of participant responses and verbatim quotes were entered into the matrix in Kyrgyz. The two frameworks were then translated into English and the charted data reviewed and interrogated to identify barriers and drivers, organized by the COM factors [30]. Similarities and differences by study site and professional role were explored for health workers, and by infant feeding practice for mothers. Finally, a matrix [32] was used to triangulate the key findings from health workers and mothers for each COM Factor.

Findings

Mothers' and health workers' perceived barriers and drivers to exclusive breastfeeding and supporting exclusive breastfeeding in the first 6 months respectively, are presented below. Findings are organised by COM factors [20], with participants' behaviours (of exclusive/ supporting exclusive breastfeeding) presented prior to individual level factors (motivation and capability) then contextual factors (physical and sociocultural opportunity). Where there were differences in barriers or drivers by study site, or professional role for health workers, or by infant feeding practice for mothers, these are indicated. Otherwise, there were no differences. Illustrative quotes are presented in Tables 3, 4 and 5.

Behaviour

All the mothers said that during their pregnancy they had planned to exclusively breastfeed. Most commenced breastfeeding immediately after delivery (Quote B1, Table 3). Those who didn't typically offered medical explanations (that were not always correct), namely mother and baby were in the intensive care unit (ICU), the baby was delivered by caesarean-section, had a low birth weight, or needed medical attention (Quote B2, Table 3). While all stated they were breastfeeding when they left the maternity hospital, this was not always exclusively.

Mothers described a variety of infant feeding practices in the first 6 months of their child's life. Some had given the baby additional fluids (e.g., boiled water, dill water

Table 3 Illustrative quotes for Behaviour

Quote ID	Quote and participant descriptor
Infant feeding in the first 6 months	
B1	*"Yes, immediately, health workers placed the child on my breast and made me breastfeed, they gave me full information. They explained to me that it is necessary to breastfeed the child until the age of one."* (Mother 3, Kara-Say city, Breastfeeding and formula)
B2	*"I began breastfeeding one and a half days after I gave birth. The child had some issues [a bump on the head] and she was receiving photo-therapy [light therapy], therefore, she was brought in for feeding after one and a half days, prior to that she was given formula."* (Mother 9, Naryn city, Exclusive breastfeeding)
B3	*"I raised [all] four of my [older] children by breastfeeding; I didn't give any food and breastfed them, except for [this] one child. My other children didn't receive anything besides breastmilk; with them I breastfed exclusively until 5 months."* (Mother 8, Uzgen district, Breastfeeding and formula)
B4	*We have 100% [of mothers], breastfeeding. The mother says she has to give formula twice a day If a baby has a neurological disease, prematurity, twins, triplets, or the mother has postpartum depression and milk does not appear. Even so, we explain that she should breastfeed first, and then if there is not enough milk, she may give formula. All healthy moms with a vaginal delivery are 100% breastfeeding.* (Doctor, Kara-Say city)
B5	*"In the villages this happens more. In my practice, it was 2–3 times. The mother continues to breastfeed the baby, but when they cry, she gives additional food."* (Doctor, Uzgen district)
B6	*"Only 1–2 mothers [give their babies formula]. The babies are usually given formula at the age of 1–3 months. Little children sleep continuously for 2–3 months, even if they move slowly and cry after 3 months, their grandmother immediately gives them at least one [dose of formula]."* (Nurse, Uzgen district)
Supporting exclusive breastfeeding in the first 6 months	
B7	*"We explain that everything that each baby needs comes from breastmilk, and then we explain the importance of foremilk and hindmilk. If the baby sucks the foremilk, the baby will not gain weight, and then you will come complaining that the baby is not full. We give the information that hindmilk is rich in protein, carbohydrates, and energy."* (Doctor, Kara-Say city)
B8	*"When the woman is at home we visit her, we check whether the woman is breastfeeding, whether she holds it [the baby] correctly… then we will show her everything and explain everything. If there are things that she does not understand, we explain again and if the family has a son-in-law or mother-in-law present, we offer to help them with this too."* (Doctor, Naryn city)
B9	*"The child comes for the weight check and vaccination, and we discuss these points. We train and we teach. We will discuss whether the baby is feeding. We ask, how she is feeding the baby, how often the child poops when he is full, whether the baby gets enough whole milk."* (Feldsher, At-Bashy district)
B10	*"We say that milk contains water, and minerals, and do not give any additional food. We say that 95% of milk is water, don't give water; We tell moms who give cookies to give less so that baby doesn't get constipated. We say that animal milk is not good for a baby, it is poorly digested by the stomach."* (Nurse, Kara-Say city)
B11	*"In the maternity hospital, they teach how to breastfeed properly, how long to breastfeed, how often. They emphasize that one should breastfeed until the age of 6 months. "*(Mother 12, Naryn city, Exclusive breastfeeding)
B12	*"The day we were discharged from the maternity hospital, we had a visit. Yes, they showed me how to hold the baby when breastfeeding, how to do it, they made me breastfeed and observed. They showed me everything, even though it is not my first child, and said that I should breastfeed for 6 months without giving other foods since breastmilk is healthy and beneficial."* (Mother 5, Uzgen district, Exclusive breastfeeding)
B13	*"The main thing is to get information when you are pregnant. Now I think about this, and I don't have any [written] information, I should have researched myself, now is the age of the Internet, I wish I had looked. If my sister said she couldn't get enough of your milk, I wouldn't have believed her if I had known about this [from information]."* (Mother 4, Bishkek city, Breastfeeding and other fluids/solids)

or tea) soon after birth or after one week. Some gave additional solids (e.g., porridge, bananas, apples, cookies softened in water) from the age of 3–4 months. The mothers supplementing with formula either started this in hospital or typically began around 2–3 months later. This was the same time that one mother switched fully from breastfeeding to formula. Multiple reasons for these practices are described below in *Capability* and *Motivation*. Notably most had adopted the same feeding practices for this child that they had used with their older children. Some, however, used different feeding practices with this baby; for example, amongst those now supplementing with formula had exclusively breastfed their older children (Quote B3, Table 3).

The perception amongst doctors was that most mothers exclusively breastfeed for 6 months (Quote B4, Table 3). Some mentioned a small minority (mostly from rural areas) who give additional fluids/solids to their baby before 6 months (Quote B5, Table 3). Similarly, some had heard of mothers giving formula milk to babies under 6 months of age, either alongside breastmilk or as a replacement. This was typically 1–2 times a day (morning and evening), commencing when the baby is 1–3 months old (Quote B6, Table 3). Of note, nurses in Bishkek believed more mothers use only formula milk referring to "several" mothers.

Health workers described recommending and supporting women with exclusive breastfeeding during antenatal appointments and classes as well as in post-natal

Table 4 Illustrative quotes for individual factors: capability and motivation

Quote ID	Quote and participant descriptor
Capability	
C1	*"Everyone knows that exclusive breastfeeding is ideal for the child. Yes, I read on the websites that it is ideally suited for the child and improves immunity and [is needed] for growth and psychological development. Exclusive breastfeeding is feeding only with breastmilk without adding any complementary foods or additional foods."* (Mother 19, Bishkek city, Exclusive breastfeeding)
C2	*The child was thirsty after feeding, that's why [gave water]. It is like with us, we also get thirsty after eating food right."* (Mother 2, Kara-Say city, Breastfeeding and other fluids/solids)
C3	*"The child was not getting satiated. I gave bananas because they are rich in vitamins. Then, when the child had constipation, I started giving a bit of apple for digestion purposes."* (Mother 18, Bishkek city, Breastfeeding and other fluids/solids)
C4	*"After my breastmilk supply decreased, I developed nipple cracks. I had little milk even though I was eating more food. That's why I began giving additional foods [formula]. I didn't have enough milk and my child started crying in the evenings, wasn't sleeping, that's why."* (Mother 3, Naryn city, Breastfeeding and formula)
C5	*"In the beginning, I had little breastmilk, but I continued to nurse when the child cried, and then the amount of milk increased, I breastfed until the age of 6 months."* (Mother, Uzgen district, Exclusive breastfeeding)
C6	"Mothers tell us that the baby couldn't suckle and let the breast out of his mouth." (Nurse, Naryn City)
C7	*"Sick mothers with HIV/AIDS do not breastfeed, we provide for them, children with congenital heart defects cannot suck the breast, and some children could not drink from a cup. There are medical indications for refusal of breastmilk [medication]. A woman with HIV/AIDS was breastfeeding for up to 3 months, all 3 months her baby had vomiting, diarrhoea, and fever, so she had to stop breastfeeding."* (Nurse, Kara-Say city)
C8	*"We say that milk contains water, and minerals, and do not give any additional food. We say that 95% of milk is water, don't give water; We tell moms who give cookies to give less so that baby doesn't get constipated. We say that animal milk is not good for a baby, it is poorly digested by the stomach."* (Nurse, Kara-Say city)
Motivation	
M1	*"Breastmilk is considered to be a source of the most essential nutrients for a baby. It is beneficial for both a child and a mother. Mother does not have to spend money to buy milk. And for a child, the first colostrum containing immunoglobulin is especially useful for the baby's hearing and sight. Breastmilk is indispensable for the health, for the mental development of a child. It also prevents dangerous diseases for a mother such as mammary gland diseases, and cancer."* (Nurse, Uzgen district)
M2	*"My breastmilk wasn't coming out, the child was hungry, he was suckling on the nipple like on an empty pacifier and nothing was coming out so the child got tired and then didn't want to suckle anymore."* (Mother 16, At-Bashy district, Breastfeeding then switched to formula only)
M2	*When you are at home and you are nursing the child in comfort. And when you are breastfeeding in a public place, you feel tense and when you feel tense, the milk doesn't come out and the baby doesn't suckle. Therefore, whenever we go anywhere, my husband says it is better to take milk formula with us so that I don't struggle.* (Mother 20, Bishkek city, Breastfeeding and formula)

visits/check-ups at home or the health facility (Quotes B7-B9, Table 3). Most believed that both family doctors and nurses were responsible for providing this support, although the health workers in Kara-Say city (Oshskaya oblast) said this work mainly fell to nurses. They also suggested that the "mothers' schools" (antenatal classes) could be better organised and more fully staffed. Health worker support comprised promoting the benefits of breastfeeding, providing advice, answering questions as well as guidance on breastfeeding techniques (described further in *Skills in supporting women to breastfeed exclusively*). Providing written information appeared to be less common. Health workers also tried to educate and encourage mothers who were using alternate infant feeding practices to try to exclusively breastfeed (Quote B10, Table 3).

Mothers' accounts of their interactions with health workers reflected those of the health workers. Most recalled receiving advice, guidance, and practical support from a variety of health workers (e.g. family doctor, nurse, gynaecologist, paediatrician) at multiple timepoints (Quotes B11, B12, Table 3). Also consistent with health workers' accounts was the scarcity of written information (Quote B13, Table 3; mentioned also in *Availability of tools and resources*).

Capability

Capability relates to mothers' and health workers' knowledge of exclusive breastfeeding and its benefits, knowledge of alternate infant feeding practices and associated risks, mothers' physical skills and ability to breastfeed and health workers' skills in supporting exclusive breastfeeding.

Knowledge of exclusive breastfeeding

Most, but not all, mothers across all infant feeding practices demonstrated understanding of what exclusive breastfeeding is, why it is recommended, and were aware of the health and nutritional benefits for mothers and babies. They knew about breastfeeding from talking to their family doctor, nurse, or paediatrician and seeing information on social media (Instagram, Facebook, from

Table 5 Illustrative quotes for contextual factors: sociocultural and physical opportunity

Quote ID	Quote and participant descriptor
Sociocultural opportunity	
SO1	*"When they came to us [in the past] with the purpose to offer their product, we told them that we would not offer the formula to mothers, however, we listened to them, thanked them, and saw them off."* (Doctor, Uzgen district)
SO2	*"When representatives from Nutrilak come, they talk to the doctors, not to us. For example, they say that Nutrilak does not cause allergies, it has little sugar or it improves the immunity system, it is 80% similar to mother's milk."* (Nurse, Bishkek city)
SO3	*"Yes, everyone supported me: my mother-in-law, parents, brothers and sisters, husband. They always said that I have to breastfeed, that it is the best thing for the child. They shared their own feeding experience."* (Mother 10, Naryn city, Exclusive breastfeeding)
SO4	*"Some of them [family members] told me that it would be better to switch to 'Nutrilak' and not breastfeed, some said that it is better not to give; according to the doctor, I did not go below the norm. I have friends who fed their child NAN."* (Mother 7, Uzgen district, Breastfeeding and formula)
SO5	*"Yes, we talked about feeding our babies. 1–2 of my close friends said that if the child is not satiated, I can give a bit of potato."* (Mother 18, Bishkek city, Breastfeeding and other fluids/solids)
SO6	*"Daughters-in-law listen to their mother-in-law. The mother-in-law puts food in the child's mouth while the daughter-in-law is doing the housework. The mother-in-law says that she was fed the same way as she fed the child."* (Doctor, At-Bashy district)
SO7	*"Due to the conditions, many females leave for labour migration, when the infants are 3–4 months of age, sometimes 2 months. They request grandmothers to look after their young infants, who they often feed artificially."* (Doctor, Uzgen district)
Physical opportunity	
PO1	*"A dummy breast, a baby doll is needed to show how milk is produced, how it should be applied, a breastfeeding cabinet is also needed. This should be provided by the state, the leadership of the medical organization." (Doctor, Bishkek city)*
PO2	*"There is a shortage of office space and time for us. Therapists are sitting in one of our offices, or a pediatrician. A newborn comes in, and on the other hand an adult is sitting with a cough in the hospital, we hurry to let the baby leave quickly. We can't explain everything to the mother."* (Nurse, Bishkek city)
PO3	*"We have the Order of the Ministry of Health of the Kyrgyz Republic 144, 33, the Law of the Kyrgyz Republic 'On protection of breastfeeding'. In all health facilities, everyone from doctors to directors, from nurses to drivers, should know the 11 steps towards breastfeeding."* (Doctor, Kara-Say city)

their health facility), the internet (including YouTube for learning breastfeeding technique), TV commercials and UNICEF materials (Quote C1, Table 4). Mothers wanted information with clear, consistent messages, from pregnancy onwards, focused on topics such as good nutrition to stimulate milk production, how to overcome perceived low supply of milk, the risks of giving formula and videos on good breastfeeding technique.

All health workers demonstrated good understanding of exclusive breastfeeding e.g. the benefits, the recommendations, how to overcome challenges, practical techniques. Most had received training on infant feeding (including exclusive breastfeeding), either during their medical/nurse training, as part of ongoing professional development e.g. BFHI training, refresher course run by Kyrgyz State Medical Institute for Retraining and Advanced Training. Many also mentioned informal training from colleagues. A few suggested that regular training updates were needed for health workers, to ensure that clear and consistent information was shared with women during pregnancy, birth, and post-natal interactions.

Knowledge of alternate infant feeding practices

Important knowledge gaps and misperceptions were evident for mothers using alternate infant feeding practices. Mothers who supplemented breastfeeding with additional fluids/solids did not seem aware of the risks and thought it was necessary to supplement for the baby to hydrate, achieve satiety and/or alleviate constipation (Quotes C2 and C3, Table 4).

Similarly, those who supplemented breastfeeding with formula or switched to formula understood that breastmilk was optimal but lacked awareness of the risks of using formula. Common misconceptions were that their breastmilk was insufficient or 'bad' and supplementing with formula (once or twice a day in the morning and evening) was needed to satiate their baby and improve their sleep. There also appeared to be limited awareness that further suckling helps to increase the mother's supply of breastmilk and that giving additional fluids/solids/formula interrupts the natural supply and demand process (Quote C4, Table 4).

By contrast, health workers appeared to have a good understanding of the risks associated with alternate infant feeding practices and communicated these to mothers.

Physical skills and ability for breastfeeding exclusively

Mothers across all four infant feeding practices mentioned some physical challenges of breastfeeding. Importantly those mothers in the exclusive breastfeeding and additional fluids/solids groups who had difficulties managed to overcome them. For example, when they perceived they had a lack of milk, they continued to breastfeed to stimulate the milk supply, or they massaged and used salve to manage cracked nipples (Quote C5, Table 4). In contrast, the mothers who switched to formula who described the same challenges, were unable to resolve them (described in *Emotions*).

Health workers acknowledged the difficulties some mothers face with breastfeeding technique, i.e. positioning, latching on, suckling (Quote C6, Table 4). They also

suggested that mental or physical health challenges i.e. depression, anxiety, tuberculosis, HIV could negatively impact on mother's ability to breastfeed (Quote C7, Table 4).

Skills in supporting women to breastfeed exclusively

Most health workers appeared competent in their knowledge and communication skills to recommend and support women to breastfeed exclusively. There was clear acknowledgment of the importance of explaining the health, nutritional and convenience benefits of exclusive breastfeeding to mothers and offering explanations e.g. how the baby feeds, the difference between foremilk and hindmilk; as well as providing advice e.g. on frequency and duration, how to prevent mastitis. Health workers also described teaching, observing, and correcting breastfeeding techniques, sometimes using a doll with areoles, pacifiers, or an artificial breast (corroborated by mothers' accounts). They explained why additional fluids/solids were unnecessary, e.g. crying can mean many things (not just thirst or hunger), breastfeeding is very rarely contraindicated. They highlighted the risks for the baby and offered advice for breastfeeding challenges (Quote C8, Table 4).

Motivation

Motivation barriers and drivers relate to mothers' and health workers' attitudes to infant feeding practices and mothers' emotions.

Attitudes towards infant feeding practices

Consistent with their knowledge (described in *Knowledge of exclusive breastfeeding)* most mothers expressed positive attitudes towards exclusive breastfeeding and their perceptions of the benefits, typically focused on infant nutrition and health, were clear drivers. Those who went on to use alternate infant feeding practices did this because they believed exclusive breastfeeding to be insufficient to hydrate and/or satiate their baby or they believed solids (in addition to breastmilk) were good for the baby e.g. bananas are rich in vitamins, or apples alleviate constipation. Common explanations for supplementing or switching to formula were persistent breast problems (sore/cracked nipples) and the belief their baby was still hungry after breastfeeding because of a perception of low milk supply and/or the baby was crying or not sleeping. Some of these beliefs may be grounded in a lack of knowledge or misperceptions (as described in *Knowledge of alternate infant feeding practices)* (Quotes C2-C4, Table 4).

Health workers were highly positive toward exclusive breastfeeding and were clearly motivated to support mothers to breastfeed. They believed in the benefits of exclusive breastfeeding for the first 6 months of life mentioning health benefits to the baby and the mother, the mother-baby connection; as well as convenience and finance. Moreover, they did not see any disadvantages of exclusive breastfeeding, or benefits of alternate infant feeding practices (Quote M1, Table 4).

Emotions

Mothers who supplemented with formula expressed an inability to resolve the physical challenges they encountered with breastfeeding. This meant these challenges were viewed as persistent problems, prompting anxiety, undermining mothers' confidence in breastfeeding culminating in the belief that formula was needed to satiate the baby (Quote M2, Table 4).

Around half of the mothers reported feeling uncomfortable about breastfeeding in public places, explaining they felt ashamed, shy, as well as concerned about hygiene and the risk of catching viruses (Quote M3, Table 4).

Sociocultural opportunity

Sociocultural opportunity factors relate to the socio-cultural context for breastfeeding, specifically health workers' views related to social and cultural demands, and mothers' views on social support and pressure.

Social and cultural demands

Discussions with health workers about sociocultural opportunity focused on the influence of the formula industry on their professional practice. Those from Oshskaya and Narynskaya oblasts were adamant they are not visited by industry representatives, with doctors and nurses in Uzgen district indicating this had happened in the past, but not since they were collaborating with the BFHI. (Quote SO1, Table 5). A key difference was evident for the doctors in Bishkek who were currently being visited by these representatives, confirmed by the nurses (Quote SO2, Table 5). They said that marketing of formula is "*prohibited*" in health facilities but found it useful to know about these products for the mothers who need them.

Social support and pressure

There were clear differences in social support and pressure for exclusive breastfeeding across the infant feeding groups. Mothers who had exclusively breastfed for 6 months described an entirely positive social environment. They had all been encouraged by their family (husband and extended family) and health workers to exclusively breastfeed, mentioning family members had offered advice as well as practical help with household chores or looking after older children. Significantly they had not experienced any advice or pressure to give their baby additional fluids, solids, or formula (Quote SO3,

Table 5). They also appeared to have friends who believed in the importance of exclusive breastfeeding with whom they shared experiences and challenges.

The social environment was more mixed for the mothers using alternate infant feeding practices. Whilst they received some encouragement and practical help to breastfeed, they had all been advised by friends and family to supplement with fluids, solids or formula or switch to formula (Quotes SO4, SO5, Table 5). Several had also been advised by a health worker to supplement at some point. Whilst health workers suggested that mothers' mothers-in-law were particularly influential in these infant feeding decisions (Quote SO6, Table 5), this was not evident in the mothers' accounts.

A few health workers commented that sometimes family members take on childcare of babies as young as 2 months when mothers return to work, or migrate abroad for work, meaning that alternate infant feeding practices occur (Quotes SO7, Table 5). No mothers talked about expressing milk for this purpose.

Physical opportunity

Physical opportunity factors related to availability of tools and resources, convenience, and legislation linked to breastfeeding and formula for health workers, and mothers returning to paid work.

Availability of tools and resources

Most health workers felt they had practical tools and resources to teach women about breastfeeding, such as a baby doll, model breast, visual aids (posters), booklets. A few doctors in At-Bashy district (Narynskaya oblast) and Bishkek expressed the need for more tools, such as videos, breast pumps and more baby dolls to help them support women, as well as specific breastfeeding rooms in healthcare facilities (Quote PO1, Table 5). As discussed above (*in Behaviour*) both health workers and mothers mentioned a lack of written information for mothers.

Convenience

Health workers reported having multiple opportunities as part of their scheduled appointments with pregnant women and mothers of infants to support them with breastfeeding. Crowded clinics and lack of time and space for these conversations was only mentioned as an issue for a small minority working in the At-Bashy district (Narynskaya oblast) and Kara-Say city (Oshskaya oblast) (Quote PO2, Table 5).

Legislation related to breastfeeding and formula

Health workers mentioned a wealth of legal documents from the Ministry of Health that provided a national imperative to support exclusive breastfeeding in Kyrgyzstan, e.g. Decree for the Food Security and National Programme (Quote PO3, Table 5). These were overwhelmingly viewed positively and seen to guide all health workers in their everyday practice.

Returning to paid work

For all mothers in the study, returning to work was not seen as a barrier to exclusive breastfeeding, although a few felt that maternity leave policies (70 days before childbirth and 56 days after childbirth [33]) should create more opportunities for mothers to stay at home rather than return to work. Most were either still on maternity leave or not in paid employment. A few had returned to work after the baby was 6 months old.

Discussion

This in-depth qualitative study uncovered multiple, interlinked barriers and drivers to mothers in Kyrgyzstan exclusively breastfeeding for 6 months, and many drivers to health workers supporting exclusive breastfeeding. These combined insights were subsequently taken to a national stakeholder workshop held in June 2023. The workshop objectives were (1) to discuss the research findings, (2) prioritize barriers to exclusive breastfeeding, and (3) agree a list of recommended tailored interventions targeting mothers and health workers (see Table 6) to be taken forward by the Ministry of Health.

A key finding was the presence of knowledge gaps and misperceptions amongst mothers who were not exclusively breastfeeding and their social support network. Most of them were motivated, had initiated breastfeeding and knew the benefits of exclusive breastfeeding. Yet their lack of understanding of infant feeding cues and misperceptions about the need for additional fluids, solids, or formula, and the associated risks, had led them to adopt these alternate infant feeding practices. Also hindering exclusive breastfeeding were physical challenges such as a perceived lack of milk, difficulties with latch or cracked nipples leading to anxiety and lack of confidence. These challenges were not unique to the mothers adopting alternate feeding practices but those who were exclusively breastfeeding appeared to overcome them. Our detailed insights echo and elaborate on earlier surveys with mothers in Kyrgyzstan [23–25]. They also reflect capability and motivation barriers and drivers reported in the wider global literature [15–17]. A clear priority is to harness new mothers' motivation to exclusively breastfeed by arming them with better knowledge and timely support when challenges arise.

There is good evidence that education, counselling, and support to develop mothers' knowledge, breastfeeding technique, and confidence can increase exclusive breastfeeding for 6 months [34–36]. To this end, health workers in this study had received training, and appeared knowledgeable, skilled, and motivated. Mothers felt

Table 6 Linking barriers to recommended tailored interventions

Barriers	Recommended interventions
Misperceptions about alternate infant feeding practices (C)	1, 2, 3, 4
Physical challenges with breastfeeding (C, M, PO, SO)	1, 2, 3, 4, 5
Lack of written information from health workers (C, PO)	1, 2
Advice and pressure from family and friends to use alternate infant feeding practices (SO)	2, 3
Formula representatives visiting doctors in Bishkek (SO, PO)	6
Feeling uncomfortable breastfeeding in public (PO, SO)	6
Recommended interventions 1. Improve exclusive breastfeeding information at discharge from maternity hospital 2. Create information tools for fathers and other family members 3. Establish peer support groups 4. Scale-up antenatal classes "schools of mothers" and its curriculum in breastfeeding 5. Implement a national telephone line for breastfeeding questions 6. Create plan and mechanisms for implementation, enforcement and monitoring of new law on health protection	

Note. C – Capability, M – Motivation, SO – Social Opportunity, PO – Physical Opportunity

well supported by them, despite their above-described challenges. Also, both groups described multiple touch points from pregnancy onwards where breastfeeding education and support occurred, perhaps reflecting the legislation on pre- and post-natal care [37]. These findings differ from previous research in Kyrgyzstan where only two-thirds of mothers (64.3%) cited health workers as an information source [24], and health workers reported a lack of training [28] and demonstrated poor knowledge of exclusive breastfeeding [24]. The difference is perhaps explained by our focus on primary care instead of the hospital focus of all previous research.

To address the misconceptions and lack of timely information and support, a series of inter-linked interventions to be integrated across antenatal and post-natal care were suggested from the stakeholder workshop. These were improve written exclusive breastfeeding information at discharge from the maternity hospital (perhaps as a tip card that provides information on common obstacles and how to overcome them), expand the availability of antenatal classes ('schools of mothers') incorporating breastfeeding as a bigger part of the curriculum, establishing peer support groups, and recruiting and training lactation and breastfeeding consultants to work with mothers who need additional support. A telephone hot line providing immediate support was suggested for intervening during the small window of opportunity when a mother is struggling with breastfeeding and might switch to other feeding practices. Tips via text message and through apps or chatbots were also proposed; although apps for early year development, including nutrition, are available in Kyrgyzstan, their use was not mentioned in the study [38].

It is well accepted that for sustained health behaviour change, focusing on individual factors i.e. capability and motivation is insufficient, and supportive sociocultural and physical environments are needed [20, 29, 30]. Indeed, there was a notable difference in the social context of mothers who were exclusively breastfeeding (encouraging and supportive family and friends) and those who were not (mix of encouragement and pressure to supplement). Relying on family members for childcare could also lead to alternate infant feeding practices. The significant impact of social support and social influence from family and friends including cultural beliefs or family traditions is well documented in the global breastfeeding literature [15, 16]. Recommended interventions from the workshop focused on educating family members and creating positive social opportunities for mothers for example through information tools specifically for fathers and other family members; and peer support groups for mothers/families to support each other to exclusively breastfeed. In additional to creating a positive social context, both interventions offer potential for educating mothers to dispel misperceptions and gain confidence to overcome physical challenges [18].

The physical environment, including normative and legal frameworks supportive of breastfeeding (and in line with the Global Strategy for Infant and Young Child Feeding [9]) alongside safe breastfeeding spaces at work and in public, is also important and was seen by health workers as supportive of exclusive breastfeeding. They saw this work as validated by the multiple laws and Ministerial decrees in Kyrgyzstan that directly or indirectly support exclusive breastfeeding for 6 months [39–42]. In November 2023 a new law on health protection of citizen's health was adopted [43], including updated articles on protection and promotion of exclusive breastfeeding. This law contains provisions to restrict, monitor and control the marketing of breastmilk substitutes, aligning with the principles of the International Code of Marketing of Breast-milk substitutes [44]. The correct implementation and enforcement of this law is crucial for its success and was a recommended action at the stakeholder workshop: create a detailed plan and mechanisms for the implementation, enforcement, and monitoring of

the recent revisions of the national legislation related to health, which includes articles on breastfeeding. In addition, the stakeholder group suggested collecting routine data to monitor exclusive breastfeeding rates nationally; strengthening BFHI implementation, including at primary healthcare level; and establishing breastmilk banks for vulnerable and low birth weight babies who cannot be fed their own mother's milk or who need to be supplemented [45].

Although formula marketing was not raised as an issue among health workers or mothers, except for some Bishkek doctors, the stakeholder group remained concerned about a potential formula marketing increase in coming years. International evidence suggests formula marketing may increase in Kyrgyzstan alongside economic development [46]. Therefore, a key recommendation was to continue monitoring formula marketing and use and consider emphasizing the importance of exclusive breastfeeding at point of sale for formula products. The latter would also help to mitigate recorded violations in proper formula labelling [47] and align with the principles of the International Code of Marketing of Breastmilk substitutes [44].

Strengths and limitations

It is important to reflect on the strengths and limitations of this study. First, it contributes to the currently small evidence base in Kyrgyzstan that was predominantly quantitative [23, 24], conducted in hospital settings [8, 28], with a broader focus on all breastfeeding [8, 23, 25, 28] or child nutrition [25].

We achieved our intended mix of urban and rural study sites and of different health worker roles. The mix of mothers with different infant feeding practices was not fully achieved across all sites, thus precluding comparisons by study site. Only one mother who had switched to formula took part so we cannot claim to have captured the perspective of this group of mothers and more research is needed. We also did not recruit any mothers with incomplete secondary education who nationally may be less likely to be exclusively breastfeeding for 6 months, although this finding is based on < 25 mothers [11, 12]. We cannot know if they face different or additional barriers. That said, sub-optimal rates of exclusive breastfeeding are evident in Kyrgyzstan for mothers across *all* education levels and we uncovered a wide range of barriers in our study. It seems likely that at least some of these barriers (and the recommended interventions to address them) will also be relevant to mothers with less education.

Use of the COM-B model [20, 29, 30] ensured a comprehensive, theory- and evidence- informed approach to identify individual and contextual determinants of behaviours. Moreover, triangulating the broad perspectives of mothers and health workers permitted a holistic, well-rounded investigation of exclusive breastfeeding in Kyrgyzstan. Together these (COM-B and triangulation) give us confidence that the final tailored interventions targeting mothers and health workers will have the best chance of increasing prevalence of exclusive breastfeeding for the first 6 months.

Conclusion

This theory-informed qualitative study focusing on mother and health worker perspectives provided important insights into the individual and contextual barriers and drivers to exclusive breastfeeding for the first 6 months in Kyrgyzstan. These insights have informed recommendations for tailored interventions for both groups. The study also addressed important gaps in the global literature as it focused on a geographical sub-region which is almost absent from the breastfeeding literature.

Abbreviations

BFHI	Baby-Friendly Hospital Initiative
COM-B	Capability-Opportunity-Motivation-Behaviour
FGP	Family Group Practice
FMC	Family Medical Centre
THP	Tailoring Health Programmes
UNICEF	United Nations Children Fund
WHO	World Health Organization

Supplementary Information

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Additional File 1. DISCUSSION GUIDE - *Health workers*

Additional File 2. DISCUSSION GUIDE - *Mothers*

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Author contributions

NA, JA, RA, EJ, AK, JW and TL conceptualised the study. CJ, ND, NA, JA, RA, EJ, AK, TM, VS, JW and TL designed the study. CJ and MD performed data acquisition, CJ, MD, TM and SL completed the data analysis. Everyone contributed to interpretation. CJ, MD and SL drafted the paper. All authors reviewed the submitted manuscript and are accountable for all aspects of this work.

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Data availability

The datasets generated during and/or analysed during the current study are not publicly available due to participants not consenting to this and our concerns about deductive disclosure (there are small numbers of health workers in the rural health facilities) but are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

All methods were carried out in accordance with relevant guidelines and regulations (Declaration of Helsinki). Ethical approval was secured from the Scientific and Production Centre for Preventive Medicine of the Ministry of Health of Kyrgyzstan and the WHO Research Ethics Review Committee. Interview and focus group discussion participants received a participant information sheet and agreed to participate and be audio recorded by signing a consent form before data collection commenced. Written informed consent was obtained from all participants.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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