

Postnatal women's breastfeeding belief, practices, and support during the COVID-19 pandemic: a cross-sectional comparative study across five countries.

Kelly Pereira Coca

Escola Paulista de Enfermagem, Universidade Federal de São Paulo

Eun Young Lee

Department of Nursing, Catholic Kkottongnae University

Li-Yin Chien

Institute of Community Health Care, College of Nursing, National Yang Ming Chiao Tung University

Ana Carolina de Prima Souza

Escola Paulista de Enfermagem, Universidade Federal de São Paulo

Punpawee Kittikul

Breastfeeding Clinic Nakhon Pathom Hospital, Nakhon Pathom

Seo Ah Hong (✉ seoah.hon@mahidol.ac.th)

ASEAN Institute for Health Development, Mahidol University, Thailand and Institute for Health and Society, Hanyang University, Seoul

Yan-Shing Chang

Florence Nightingale Faculty of Nursing, Midwifery and Palliative Care, King's College London

Research Article

Keywords: breastfeeding, postnatal, COVID-19, belief, healthcare support

Posted Date: April 6th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1514949/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Abstract

Background: Breastfeeding is known to have many benefits and breast milk contains antibodies to protect infants against childhood illnesses, morbidity, and death. Women with COVID-19 had a lot of concerns and doubts about the safety of breastfeeding for their babies, and breastfeeding support may impact breastfeeding practice. This study aim to compare breastfeeding belief, practice, and contact methods with healthcare professionals for receiving postnatal feeding support during the COVID-19 pandemic in five countries: Brazil, South Korea, Taiwan, Thailand, and United Kingdom.

Methods: A multi-country cross-sectional study was conducted with postnatal women in five countries. Women who were up to 6 months postpartum were invited to an online self-administered questionnaire Survey Forms about their transmission and preventive measures belief towards breastfeeding, infant feeding practices, and experiences of postnatal infant feeding support received, between July to November 2021. Student's t-tests or one-way analysis of variance tests were performed to determine significant relations of the mean belief scores.

Results: A total of 3,253 eligible response were received. The mean of the belief score were significantly different among countries ($p < .0001$). Women in Brazil and the UK had a higher rate of breastfeeding at breast (90.7% and 85.4% respectively) compared to the three countries in Asia ($p < 0.0001$), while feeding with expressed breastmilk in Thailand (59.9%), Taiwan (52.6%) and South Korea (50.4%) was higher than the others ($p < 0.0001$). Brazil and UK mothers (16.0, SD= 2.1 and 14.5, SD= 1.9, respectively) had a higher mean score of belief towards breastfeeding during the COVID-19 than the others. Those results were inversely associated with breastfeeding but positively formula feeding practice. Postnatal feeding support during the COVID-19 pandemic was mainly provided by healthcare professionals (67.1%) and peers/family by face to face personal contact (51.6%) in all countries.

Conclusion: There are some differences in belief towards breastfeeding during the COVID-19 in Asian countries. A positive breastfeeding belief was associated with infant feeding at breast practice. Women from all countries received postpartum infant feeding support from health professions and peers/family through in personal contacts. Government needs to emphasize and disseminates the importance of breastfeeding safety, especially in Asian countries.

Background

Breastfeeding is known to have many benefits and breast milk contains antibodies to protect infants against childhood illnesses, morbidity and death, preventing around 823,000 child death annually [1, 2]. Thus, WHO recommends exclusive breastfeeding (EBF) for the first six months of a child's life and, combine complementary food with breastfeeding for up to two years or more [2].

The rates of any breastfeeding at 6 months postpartum or less varied between countries pre-pandemic e.g. South Korea 60.8% (2011) [3], Taiwan with 49.9% (2011) from UK with 34% (2012) [4]; while 45.8% (EBF) in Brazil (2019) [5, 6] and 14.1% in Thailand (2020) [7, 8].

Even in the midst of the COVID-19 pandemic, which rates and number of death vary in many countries [9], breastfeeding can be an effective strategy to protect infants [10]. During COVID-19, women are recommended to breastfeed in the first hour after delivery, to have skin to skin contact with their baby, which helps to continue to exclusively breastfeed their babies [9].

Furthermore, women with suspected or confirmed COVID-19 also are encouraged to breastfeed [9, 11] as the benefits of breastfeeding outweigh the potential risks for virus transmission [10, 12, 13]. In addition, preventative measures should be taken to reduce the transmission from mother to baby by washing hands using soap and water before touching their child, expressing breast milk if she decided not to breastfeed directly on breast, either with a breast pump or handing expression, and wearing a mask during breastfeeding [11, 14].

Despite the recommendation, women with COVID-19 had a lot of concerns and doubts about the safety of breastfeeding for their babies [15]. Further, the number of the COVID-19 cases, its death rate and the control measures may impact on infant feeding practices through perception towards breastfeeding against risk of infection. Regardless, once breastfeeding is a practice that across cultures and, in some populations, women don't breastfeeding as long as they are planned because they belief that breast milk alone will not satisfy the babies, giving them infant formula or other food in addition to breast milk and/or introducing water

[16], as well health professional care, workplace, and marketing policies might influence breastfeeding rates [17]. So, in COVID-19 pandemic breastfeeding rates could aggravate with misinformation about benefits of breastfeeding and infant protection [18]. Also, have been a challenge to give breastfeeding support by services and professional health during the COVID-19 pandemic and may impact breastfeeding practice [19, 20].

Since the WHO declared COVID-19 as a global pandemic, it is important to know what the impact on women and their breastfeeding practice in different countries. UK and Brazil had higher rates of death from SARS-CoV2 infection, while Asian countries had lower rates of death. There is few study on the impact of COVID-19 on women's breastfeeding practice among countries [21–23]. The present study aims to compare breastfeeding belief, practice, and contacts methods with healthcare professionals for receiving postnatal feeding support during the COVID-19 pandemic in five countries: Brazil, South Korea, Taiwan, Thailand, and United Kingdom (UK).

The knowledge of impact of COVID-19 pandemic on infant feeding practice and breastfeeding support in countries with various geographical locations and COVID-19 rates, may provide valuable insights for breastfeeding promotion during a pandemic like COVID-19. It may contribute to achievement of the many of the Sustainable Development Goals of the 2030 agenda, as breastfeeding should be a priority as a practice to protect the survival and health of babies and women [2, 24, 25].

Methods

Study design and sampling

We conducted a multi-country online cross-sectional study in five countries: Brazil, South Korea, Taiwan (Republic of China), Thailand and the UK. Postnatal women were invited to a survey about their infant feeding practices, experiences of postnatal infant feeding support received, and transmission and preventive measures belief towards breastfeeding during the covid-19 pandemic, between July 2021 to November 2021.

Women who were up to 6 months postpartum, 18 to 49 years old (Taiwan between 20 to 49 years old), literate in the country's official language were included. Exclusion criteria were women who are not living in one of the study countries during the survey period, and who were not able to read the questions.

The questionnaire was developed in English and translated into the local languages of participating countries (Portuguese, Korean, Chinese, and Thai), and backward translation into English. The researchers and some breastfeeding women of each participating country reviewed to detect any unclear statement, or misleading or highly sensitive questions in the research instrument, and to verify the questions to ensure the validity and reliability of the questionnaire before to be used in an online survey. Based on these results and comments from the data collectors, minor wording revisions were made.

Data collection

Due to COVID-19 preventative measures to minimise the spread of the virus, data were collected with online Google Forms for web-based survey. The survey information was distributed via emails, social media (Facebook, WhatsApp, Instagram, Twitter, etc.), personal networks, health professional groups and non-for-profit organizations. South Korea used a private company for recruitment.

All women who participated voluntarily signed an online informed consent before starting the survey according to the Ethical Committee approval from each country. In addition, prior to signing the informed consent, information about the study design and purpose were presented, including assurance of the confidentiality.

Measures of variables

The variables investigated included:

Sociodemographic factors: maternal age, education level, working status, maternal status, residence (urban or rural), as well as age and sex of child.

Infant feeding practice was assessed with the question: “How was your youngest baby fed in the last 24 hours?” (Response option “Yes” or “No”): 1) Breastfeeding (baby only fed directly from breast); 2) Expressed breast milk; 3) Infant formula; and 4) Solid, semisolid, or soft foods (including non-breast milk liquids) and “Have you completely stopped breastfeeding and giving your expressed breast milk for your youngest baby?” (Stopped breastfeed, still breastfeed, never breastfeed) were also asked.

Belief of breastfeeding during COVID-19 pandemic about covid-19 virus transmission through breast milk and preventive measures while breastfeeding was measured with 6 question items, followed WHO recommendations (26). Women were asked to rate on a 3-point Likert scale (Agree, Uncertain and Disagree) for the statements: 1) “COVID-19 can pass on to baby through breast milk and breastfeeding”, 2) “If the mother is confirmed or suspected to have COVID-19, the mother should not breastfeed”, 3) “For a mother is confirmed or suspected to have COVID-19, a baby should be immediately placed skin-to-skin and breastfeed following delivery”, 4) “If the mother is confirmed or suspected COVID-19, it is safer to give a baby infant formula milk than giving the mother’s breast milk; breastfeeding”, 5) “A breastfeeding mother who is confirmed or suspected to have CAVID-19 should always wear a face mask when breastfeeding”, and 6) “A mother who is confirmed or suspected to have COVID-19 can touch and hold her newborn baby without wearing a face mask”. The #3 and #5 questions were reversely coded before summing. The total score ranged from 6 to 18 scores, and a higher scores means more positive breastfeeding belief.

Postpartum infant feeding support received was assessed with three multiple answer questions: 1) “Who do you receive support postnatal infant feeding (Mark all that apply)?” (Response options are i) no support received, ii) from healthcare professionals, iii) from spouse/partner, friends or relative, iv) online support group (e.g., Facebook) and v) others); 2) “How do you make contacts with healthcare professionals for postpartum support (Mark all that apply)?” (Response options are i) never, ii) in person, iii) by phone, iv) video, v) others), and 3) “If you have received breastfeeding support though video contact with any infant feeding supporters (e.g.: healthcare professionals, per supporters etc.), have you experienced any difficulties (Mark all that apply)?” (Response options are i) never had video contact, ii) no difficulty, iii) supporter unable to clearly see the baby’s latch, iv) supporter was unable to hear me well, v) cannot hear support well, vi) cannot see support well, vii) cannot operate the device and breastfeeding same time, and viii) other).

Statistical analysis

Descriptive statistics were used for measuring the frequency and proportion for categorical variables, such as general characteristics, infant feeding practices, and experience about postnatal infant feeding support received and questions of belief towards breastfeeding during COVID-19 and mean and standard deviation (SD) for continuous variables, such as total score of belief toward breastfeeding and COVID-19. Comparison of percentages of the variables by countries were assessed using Chi-square tests for categorical variables. Student’s t-tests or one-way analysis of variance (ANOVA) tests were performed to determine significant relations of the mean belief scores with all examined variables. All analyses were conducted using SAS 9.3 (SAS Institute Inc., Cary, NC, USA).

Results

A total of 3,507 women completed the questionnaire and 3,253 met the inclusion criteria. Most of them were between 30–39 years old (61.7%); the educational level was high with 64.4% of women having a university or a postgraduate degree; 59.2% were on maternity leave, married (95.5%) and lived in an urban area (72.6%). Although 39.5% of children in the study were between 1–2 months, most of them in Taiwan (36%) and South Korea (42.8%) were between 3–4 months. The sex of the children was similar between the number of boys and girls (Table 1).

Table 1
Women's sociodemographic background in Brazil, United Kingdom, Taiwan, Thailand, and South Korea

Participants	Total	Brazil	Taiwan	Thailand	South Korea	UK
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
	N = 3253	N = 560	N = 614	N = 840	N = 381	N = 858
Maternal Age (years)						
18–29	1094 (33.6)	164 (29.3)	204 (33.2)	489 (58.2)	51 (13.4)	186 (21.7)
30–39	2005 (61.7)	360 (64.3)	397 (64.7)	318 (37.9)	311 (81.6)	619 (72.1)
41–49	154 (4.7)	36 (6.4)	13 (2.1)	33 (3.9)	19 (5)	53 (6.2)
Education level						
College/Secondary or lower	1157 (35.6)	85 (15.2)	73 (11.9)	458 (54.5)	355 (93.2)	186 (21.7)
University/ postgraduate	2096 (64.4)	475 (84.8)	541 (88.1)	382 (45.5)	26 (6.8)	672 (78.3)
^aWorking status						
Yes	564 (17.3)	87 (15.6)	28 (4.6)	357 (42.5)	61 (16)	31 (3.6)
No	762 (23.5)	104 (18.6)	99 (16.1)	312 (37.1)	197 (51.7)	50 (5.8)
On maternity leave	1926 (59.2)	368 (65.8)	487 (79.3)	171 (20.4)	123 (32.3)	777 (90.6)
Maternal status (married)	3105 (95.5)	521 (93)	605 (98.5)	759 (90.4)	380 (99.7)	840 (97.9)
Residence local (urban)	2360 (72.6)	542 (97.1)	535 (87.1)	382 (45.5)	360 (94.5)	541 (63.1)
Age of child						
1–2 months	1285 (39.5)	238 (42.5)	197 (32.1)	477 (56.8)	73 (19.2)	300 (35)
3–4 months	1099 (33.8)	195 (34.8)	221 (36)	218 (26)	163 (42.8)	302 (35.2)
5–6 months	869 (26.7)	127 (22.7)	196 (31.9)	145 (17.2)	145 (38)	256 (29.8)
Sex of child (boy)	1644 (50.5)	293 (52.3)	316 (51.5)	435 (51.8)	174 (45.7)	426 (49.7)

Table 2 demonstrates infant feeding practice in the last 24 hours. Mothers reporting breastfeeding directly from breast was 73.5%, expressed breastmilk 38.3%, formula milk 40.6% and complementary foods 11.9%. By country, women in Brazil and the UK had a higher rate of breastfeeding at breast (90.7% and 85.4% respectively) compared to the three countries in Asia ($p < 0.0001$), while feeding with expressed breastmilk in Thailand (59.9%), Taiwan (52.6%) and South Korea (50.4%) was higher than the others ($p < 0.0001$). For feeding with formula milk and complementary foods, the higher rates were found in Taiwan (73.3% and 21.7% respectively) and South Korea (57.5% and 15.8%) compared to the others. Mothers also reported they completely stopped breastfeeding was 19.3% in all countries, higher in South Korea (33.9%), Thailand (28.2%) and Taiwan (26.6%) than Brazil and the UK ($p < 0.0001$).

Table 2
Infant feeding practice in Brazil, Taiwan, Thailand, South Korea, UK

	Total	Brazil	Taiwan	Thailand	South Korea	UK	p-value
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
	N = 3,253	N = 560	N = 614	N = 840	N = 381	N = 858	
Infant feeding							
BF at breast	2392 (73.5)	508 (90.7)	333 (54.2)	544 (64.8)	274 (71.9)	733 (85.4)	< .0001
Breast milk expressed	1246 (38.3)	77 (13.8)	323 (52.6)	503 (59.9)	192 (50.4)	151 (17.6)	< .0001
Infant formula	1321 (40.6)	111 (19.8)	450 (73.3)	328 (39.1)	219 (57.5)	213 (24.8)	< .0001
Solid, semisolid, or soft foods	388 (11.9)	39 (7)	133 (21.7)	66 (7.9)	60 (15.8)	90 (10.5)	< .0001
Have you completely stopped breastfeeding?							
Stopped BF	626 (19.3)	14 (2.5)	163 (26.6)	237 (28.2)	129 (33.9)	83 (9.7)	< .0001
^a Still BF	2493 (76.8)	528 (95.7)	442 (72)	534 (63.6)	239 (62.7)	750 (87.4)	
Never BF	126 (3.9)	10 (1.8)	9 (1.5)	69 (8.2)	13 (3.4)	25 (2.9)	
<i>A p-value < 0.05 indicates statistical significance</i>							
^a Breastfeeding includes expressed breast milk							

Abbreviations: BF, breastfeed(ing)

Figure 1 presents results of belief towards breastfeeding in relation to COVID-19 transmission and preventive measures by country. The belief that the “coronavirus can pass on to babies through breast milk and breastfeeding” (question 1) and when “mother confirmed or suspected to have COVID-19 should not breastfeed” (question 2) were agreed by most women from South Korea (57% and 72% respectively) followed by Thailand (27% and 47%) and Taiwan (20% and 49% respectively). Brazil (6% in both) and UK (4% and 1% respectively) presented the lowest rates of agreement of those affirmations. Similar results were identified when they responded about “if the mother is confirmed or suspected COVID-19, it is safer to give a baby infant formula milk than giving the mother’s breast milk/breastfeeding” (question 4): 74% in South Korea, 60% in Taiwan, 57% in Thailand, 7% in Brazil, and 2% in UK.

When they are questioned if “a mother is confirmed or suspected to have COVID-19, a baby should be immediately placed skin-to-skin and breastfeed following delivery” (question 3), the disagreement was high UK (60%) and Brazil (43%) when compared to the Asian countries: 21% in Thailand, 17% in South Korea, and 14% in Taiwan (Figure 1).

Mothers were asked about wearing a mask during breastfeeding (question 5) or take care of the babies (Question 6) if a breastfeeding mother who is confirmed or suspected to have COVID-19. Women from all countries disagree in both (67% and 57% respectively), especially in Brazil (92% and 83% respectively) followed by Taiwan (90% and 78%), South Korea (79% and 65%), Thailand (65% and 60%) and UK (31% and 21%) (Figure 1).

Table 3 shows the mean score of belief towards breastfeeding in relation to COVID-19 transmission and preventative measures by infant feeding practice and country. The mean score of belief towards breastfeeding during the COVID-19 was 13.3 (SD= 2.7) in pooled sample. The mean of the belief score were significantly different among countries ($p < .0001$). Brazil and UK mothers (16.0, SD= 2.1 and 14.5, SD= 1.9, respectively) had a higher mean than the others (12.7, SD= 2.2 in Taiwan, 12.0 SD= 2.3 in Thailand, and 11.1, SD= 1.9 in South Korea). Women breastfeeding at breast had high score of belief towards breastfeeding in

pooled sample ($p<0.0001$), and by country with the statistically significant difference seen in Taiwan ($p<0.0001$) and the UK ($p<0.0001$). Meanwhile those feeding infant formula had a low score of belief towards breastfeeding in pooled sample ($p<0.0001$) and the result was statistically significant in Taiwan, Thailand and the UK ($p<0.0001$). Those feeding expressed breast milk and complementary foods had a lower score of belief in pooled sample ($p<0.0001$ and $p<0.05$, respectively) but their significant associations were not found in country level.

Table 3 Associations of infant feeding practice and belief towards breastfeeding (score) in Brazil, Taiwan, Thailand, South Korea, UK

	Total N= 3,253 Mean (SD)	p- value	Brazil N= 560 Mean (SD)	p- value	Taiwan N= 614 Mean (SD)	p- value	Thailand N= 840 Mean (SD)	p- value	South Korea N= 381 Mean (SD)	p- value	UK N= 858 Mean (SD)	p- value
Belief toward BF	13.3 (2.7)		16.0 (2.1)		12.6 (2.2)		12.0 (2.3)		11.1 (1.9)		14.5 (1.9)	
Infant feeding practice												
BF at breast												
Yes	13.7 (2.7)	<.0001	16.0 (2.0)	0.065	13.0 (2.2)	0.000	12.0 (2.2)	0.914	11.1 (1.9)	0.759	14.7 (1.8)	<.0001
No	12.4 (2.4)		15.5 (2.3)		12.3 (2.1)		12.0 (2.3)		11.1 (1.9)		13.5 (2.2)	
Breast milk expressed												
Yes	12.5 (2.5)	<.0001	15.7 (2.2)	0.226	12.7 (2.2)	0.805	12.0 (2.3)	0.761	11.0 (1.8)	0.168	14.6 (2.0)	0.455
No	13.9 (2.6)		16.0 (2.1)		12.6 (2.2)		12.0 (2.3)		11.3 (1.9)		14.5 (1.9)	
Infant formula												
Yes	12.5 (2.5)	<.0001	15.6 (2.3)	0.083	12.4 (2.1)	<.0001	11.6 (2.4)	<.0001	11.0 (1.8)	0.300	13.9 (2.2)	<.0001
No	14.0 (2.6)		16.1 (2.0)		13.4 (2.3)		12.2 (2.3)		11.2 (1.9)		14.7 (1.7)	
Solid, semisolid, or soft foods												
Yes	13.1 (2.5)	0.015	15.9 (2.2)	0.826	13.0 (2.1)	0.117	11.8 (2.0)	0.500	10.8 (1.6)	0.100	14.5 (1.9)	0.919
No	13.4 (2.7)		16.0 (2.1)		12.6 (2.2)		12.0 (2.3)		11.2 (1.9)		14.5 (1.9)	

A p -value <0.05 indicates statistical significance

Abbreviations: BF, breastfeed(ing)

Table 4 shows postnatal infant feeding support received. The pooled sample shows that postnatal infant feeding support was mainly received from health professionals (67.1%) and community (spouse/partner/relatives/friends) (51.6%). The support from the two groups were predominantly shown in all countries, while support from health professionals were disproportionately high

in Thailand (86.3%) and Taiwan (71.0%). A third reported to obtain support by online groups, mostly in the UK and Thailand (48.6% and 35.5%, respectively).

Support received in person was the most common in pooled sample (55.7%) and in all countries (ranging 68.4% in Brazil to 42.0% in the UK). Support by phone was also high in pooled sample (32.8%), ranging from 51.8% in Thailand and 40.8% in UK to 8.4% in South Korea. Women reporting support via video was 8.8% in pooled sample with a highest rate in Brazil (13.8%) followed by the UK (11.9%). Most women who received support via online video platforms reported experiencing no difficulties (59.3%), but when difficulties were experienced, the most common one was that the supporter was unable to clearly see their baby’s latching (23.5%), especially in the UK (46.1%). Meanwhile, women reporting no support received were relatively high (26.7%), ranging from 47.2% in South Korea and 34.2% in the UK to 11.4% in Thailand (Table 4).

Table 4 Postnatal infant feeding support received by women in Brazil, Taiwan, Thailand, South Korea, UK

	Total n (%) N= 3,253	Brazil n (%) N= 560	Taiwan n (%) N= 614	Thailand n (%) N= 840	South Korea n (%) N= 381	UK n (%) N= 858	p- value
Support for postnatal infant feeding							
No received support	505 (15.5)	83 (14.8)	34 (5.5)	5 (6.6)	137 (36)	196 (22.8)	<.0001
Healthcare professional	2182 (67.1)	352 (62.9)	436 (71)	725 (86.3)	179 (47)	490 (57.1)	<.0001
Spouse/partner, relative or friend	1678 (51.6)	359 (64.1)	462 (75.2)	307 (36.6)	108 (28.4)	442 (51.5)	<.0001
^b Online group support	998 (30.7)	110 (19.6)	109 (17.8)	298 (35.5)	64 (16.8)	417 (48.6)	<.0001
^c Others	235 (7.2)	4 (0.7)	154 (25.1)	0	0	77 (9)	<.0001
^aContact with any infant feeding supporters							
Never	868 (26.7)	135 (24.1)	164 (26.7)	96 (11.4)	180 (47.2)	293 (34.2)	<.0001
In person	1812 (55.7)	383 (68.4)	400 (65.2)	485 (57.7)	184 (48.3)	360 (42)	<.0001
By phone	1066 (32.8)	135 (24.1)	114 (18.6)	435 (51.8)	32 (8.4)	350 (40.8)	<.0001
Video	285 (8.8)	77 (13.8)	28 (4.6)	72 (8.6)	6 (1.6)	102 (11.9)	<.0001
Others	59 (1.8)	16 (2.9)	0	0	0	43 (5)	<.0001
Support through video contact with any infant feeding support							
Never had	2435 (82)	410 (84.9)	486 (82.9)	511 (66.5)	313 (83.5)	715 (94.6)	<.0001
No difficulty	169 (59.3)	57 (74)	22 (78.6)	42 (58.3)	4 (66.7)	44 (43.1)	0.0002
Supporter unable to clearly see the baby's latch	67 (23.5)	7 (9.1)	4 (14.3)	8 (11.1)	1 (16.7)	47 (46.1)	<.0001
Supporter was unable to hear me well	13 (4.6)	1 (1.3)	0	5 (6.9)	0	7 (6.9)	0.2237
Cannot hear support well	14 (4.9)	2 (2.6)	0	4 (5.6)	1 (16.7)	7 (6.9)	0.2874
Cannot see support well	12 (4.2)	1 (1.3)	0	4 (5.6)	0	7 (6.9)	0.2659
Cannot operate the device and BF same time	38 (13.3)	5 (6.5)	1 (3.6)	8 (11.1)	1 (16.7)	23 (22.6)	0.0099
Others	9 (3.2)	2 (2.6)	0	0	0	7 (6.9)	0.0875

A *p*-value<0.05 indicates statistical significance

Abbreviations: BF, breastfeed

^aMost common contact

^b Facebook or other group support

Discussion

This study to our knowledge is the first study to examine breastfeeding belief, practice, and postnatal infant feeding support during the COVID-19 across 5 countries. This multi-country study revealed some differences in belief towards breastfeeding during the COVID-19 in Asian countries, compared to Brazil and UK. Compared to women in the UK and Brazil, a higher proportion of women in the Asian countries believed women with suspected or infected with COVID-19 infection can transmit COVID-19 virus during breastfeeding, including through breastmilk, and skin-to-skin. Compared to the other countries, women in Brazil presented lowest rate of believing that wearing face mask should always be worn when breastfeeding and when they are touching and holding her baby. Postnatal women's belief towards breastfeeding may affect breastfeeding practice. Women breastfeeding at breast had high score of belief towards breastfeeding meanwhile those feeding infant formula had a lower score. Women reported that postpartum infant feeding support was received mostly from health professionals and peers/family through in personal contact in all countries, while the support via online group was also relatively higher in Thailand and UK compared to the rest of the countries. More than 10% of the women in Brazil and the UK reported receiving Lactation support via a video contact.

Belief towards breastfeeding

A cultural beliefs and practices impact in breastfeeding practices [27]. Despite a lot of scientific evidence of the benefits of breastfeeding [1], women in different countries have their culture beliefs, myths and misconceptions that can have negative impact on their breastfeeding practice [28].

In our study, the mean of the belief towards breastfeeding score in relation to COVID-19 transmission and preventative measures by infant feeding practice were significantly different among countries. A high rate of belief of "transmission of COVID-19 through breastmilk" (#1) and "should avoid breastfeeding if women is suspected or infected with COVID-19" (#2) were found in three Asian countries. A reason could be that the safety of BF during COVID-19 is not widely disseminated by Asian countries than UK and Brazil, despite the recommendation from several international health agencies and medical societies. Furthermore, at the early stage of the COVID-19 pandemic, professional health support temporary separate babies from their women after birth and suggest expressed breastmilk as an initial recommendation, because of concern for COVID-19 transmission risk by breastfeeding, as American Academy of Pediatrics and Royal College Society of Neonatology [29].

Once evidence shows that SARS-CoV-2 is not likely to be transmitted via breast milk [30] and the impact of breastfeeding to guarantee food safe to children [31], the recommendation to breastfeed grow and became unified from most of agencies and medical societies [32].

Our results showed a low rate of belief in "proper skin-to-skin and breastfeeding following delivery" (#3) were seen in all three Asian countries compared to the others. Different postpartum practice in hospitals and maternity services which did not follow the WHO recommendation can bring confusion to women whether they should or not breastfeeding their babies [28].

Our finding in belief about practice of facemask use when holding your baby, including during feeding (#5-6), women from Brazil reported a lower rate of respondents agreeing to wear a mask when breastfeeding and to touch and hold her newborn baby. Despite the recommendation protect nose and mouth with a mask during breastfeeding [11], a reason could be less concerns about transmission of COVID-19 and the importance of visual face-to-face interaction with their babies to development brain [33], nurturing and bonding in a deep share connection [34].

Also, we found that the beliefs towards breastfeeding were associated with BF practices, which we discuss next.

Breastfeeding practice

Breastfeeding rates are low in the world [1]. Our results showed 73% of women in all countries breastfed at breast in the last 24 hours. Brazil presented the highest rates with 91% of their babies followed by UK (85%) and South Korea (72%). Because of different COVID-19 waves between countries, it is difficult to compare with other studies how BF was impacted. A study, carried in April

2020 in a lockdown UK period, identified that infant feeding is influenced by women negative emotional and anxiety symptoms when they had more than one child to take care [35]. Around 27% women had barriers stemming from lockdown to continue breastfeeding [36]. Another study in UK, in 27th May to 3rd June 2020, showed 59% women who delivered during lockdown had infants exclusively breast-fed/mixed fed compared to 39% who delivered before COVID-19 pandemic [37]. In Thailand, in July to October and December 2020 to February 2021, after lockdown from April to June same year, showed a slight decreased in 4.3% BF practices during the pandemic COVID-19 lockdown (38). Also, in Italy a study conducted in March to May 2020 showed similar results, a decrease of EBF than women before COVID-19 pandemic (2018) (39) as in USA Rates with women that gave birth before 2020 [20]. Despite of those findings, a study in China carried in August to October 2020 to compared the infant feeding experiences of women, who delivered before and during COVID-19 pandemic in Beijing, identified BF practice rates was maintained during pandemic situation [21].

Evidence of breast milk from women infected by COVID-19 contains antibodies against SARS-CoV-2 and can protect infants [40]. Despite the benefits and breastfeeding recommendation during COVID-19 infection, concerns, and fear about COVID-19 transmission from mother to infant through BF may affect to infant feeding practice. Further, women maybe have influenced by multifactor to decide how feed their infant, since breastfeeding media and belief during COVID-19 pandemic varies according government, politics, socioeconomic status, health inequities in each countries [41]. Thus, further studies are needed to identify how breastfeeding belief regarding covid-19 transmission and prevention measures affect breastfeeding practices in various settings and populations. Our study found the positive breastfeeding belief was positively associated with baby breastfeed at breast, and inversely associated with infant formula. All three Asian countries presented lower rates of breastfeeding at breast and had a lower belief score, when compared with Brazil [16] and UK [14.7] that presented higher rates of breastfeeding at breast. Also, Asian women have a similar or slightly lower rate of breastfeeding using expressed breast milk, while UK and Brazil had a higher rate of BF from breast. We found breastfeeding women use to express breast milk, 60% in Thailand, followed by 53% in Taiwan and 50% in South Korea.

Any factors may interfere in breastfeeding practice, as marital status, educational level and place of birth [21]. Expressing breast milk may protect continue breastfeeding. A study with Singaporean Chinese women showed an increased practice of expressed milk and combination feeding, defined as breast milk and non-breast milk fed via bottle and breast, while direct feeding from breast were in decreasing trend over time [42]. Women use to expressed breast milk when they don't want to breastfeed in public or went back to work. There is an increasing number of working moms in Asia, that cause a changing to infant feeding practice due to participation rate in the labor force among Asian women (Thailand 59.2%, and South Korea 53.2%) [43]. Breastfeeding at breast in public places or at work is still challenging for all women, maybe worst in Asia. In Korea, women who return to their work after maternity leave stated that their work status directly affected their decision not to breastfeed their babies. The primary reason given for not breastfeeding was that "it is not easy to express milk at work". Further, the expressed BF rate was higher than breastfeeding at breast: "Breastfeed mostly with an occasional bottle with expressed breastmilk (44.2%) vs. Breastfeed only (26.9%) [44]. Once our women characteristics showed work status are not very different, there is no study found that we can compare with results, and more studies need to be explored to find those differences.

Another study showed the influence of social policy on breastfeeding duration, such as breastfeeding policy of hospital and national parental leave, although social policy was not statistically associated with the BF duration in a recent Korean study [45]. Further, women with high education are more likely to know the health benefits of breastmilk but they are more likely to involve in out-of-home activities or be employed. It thus made women difficult direct feeding but expressed breastmilk or combination feeding. Comparing those results our participants had high educational level (64.4% of women having a university or a postgraduate degree) but 59.2% were on maternity leave. We found that infant feeding formula was 41% in pooled sample, higher in Taiwan with 73%, followed by South Korea with 57%. A high formula feeding rate in Asian countries during the covid-19 pandemic. Despite the benefits of expressed breast milk to support continue BF practice, women who exclusive expressing in early postpartum may not achieve long-term BF duration [46]. Using breast milk instead of formula feeding gives to babies the benefits of human milk but can also reduce the breastfeeding at breast and increase formula feeding [47].

Postnatal feeding support

Breastfeeding face-to-face support by professional and/or peer support improved breastfeeding rates [48]. Also, early breastfeeding support was related to increased breastfeeding by 24% [49]. Our study found postnatal feeding support was mainly received from health professions and peers/family through in person contacts in all countries. A systematic review showed partner's and family members' views and experiences of breastfeeding support reflected multi-faceted factors of their support [50]. Facilitators to EBF are good knowledge and skills among healthcare professionals and support of health care services to improve breastfeeding practice [50-52]. Sufficient information and support received with tailored and practical are reasons breastfeeding women continue breastfeeding [50, 53].

COVID-19 pandemic interfered in women getting postnatal in-person follow-up care and in-person breastfeeding support [15]. A study that compare postnatal experiences of women who delivered before and during lockdown in UK identified a decreased feeding support from 57% to 40% [37]. Despite the pandemic situation, our study found more than 50% of women with professional support (67% in pooled sample), ranging from 86% in Thailand to 47% in South Korea. UK presented 57%, similar rate before lockdown [37]. Meanwhile, women reporting no support given were high in South Korea and UK.

Health support can vary according to countries restriction and pandemic waves. Some countries might face policies restricted services and women received virtual professional and/or peer support. Remote support has been considered during COVID-19 pandemic. A systematic review showed that remote breastfeeding support and education combined with support in hospital reduce the risk of women stopping breastfeeding at 3 months by 25%, although it is less clear if that intervention change of stopping any breastfeeding at 8 weeks, 3 and 6 months [54]. We found 31% receiving online group support, 33% of women receiving phone and 9% by video breastfeeding support. UK presented higher rates of online group support (49%) and phone support (41%) as Thailand (35% and 52% respectively). Remote support, with online videos calls and phone, increased during the pandemic, also because it helps women with infection to be in self-isolation and receive breastfeeding support due to COVID control measures [55]. In our study 59.3% of women who received online video platform support reported experiencing no difficulties, and 23.5% supporter was unable to clearly see their baby's latching.

Access to breastfeeding support in hospitals and communities are also restricted because of control measures of covid-19 pandemic. Some face-to-face breastfeeding support services by healthcare professionals and breastfeeding peer supporters were temporarily replaced by virtual support via telephone or virtual platforms [56, 57], which may be affected by a nation's covid-19 infection control measures. Although virtual breastfeeding support has benefits of being convenient for women to stay at home and receive support, a study conducted in United States shows moderate effectiveness of virtual professional support with challenges including assisting with latching or analyzing body language of the baby during the session [57]. How virtual and remote breastfeeding support can be best provided, to whom, and in what circumstances need further investigation to enable technologies to enhance breastfeeding support.

On the other hand, with no internal support (spouse and family) and external support (professional health, friends, and employers providing room for pump breast milk) women might decide do not continue to breastfeed [58]. A systematic review shows the importance of community peer support to increase exclusive breastfeeding duration in low- and middle-income countries, specially for infants with 3 to 6 months (59). BF peer support is a good strategy to protect BF because it increased women's self-esteem and confidence [60]. Taiwanese women feel motivating to breastfeeding in many ways when they have services provided by in-centre care organizations, that facilitate networking with other mothers women [61], but in COVID-19 pandemic it can be a challenge.

Limitations

Limitations considered were that since only women who can access to the internet could participate in the study, participants were more likely to be young, to have high education and to live in urban areas. In addition, recruitment using online nonprobability samples tend to be prone to have certain lifestyles. Also, in UK and Brazil, some infant feeding support organization helped disseminate the online survey info. These requirement channels might attract women who were interested in infant feeding (breastfeeding or breastfeeding support) to complete the survey. Thus, the finding of the study cannot be generalized to other population and settings.

Conclusion

There are some differences in belief towards breastfeeding during the COVID-19 in Asian countries, compared to Brazil and the UK. A positive breastfeeding belief was associated with infant feeding at breast practice. Women from all countries received postpartum infant feeding support from health professions and peers/family through in personal contacts. Online group support was higher in Thailand and UK compared to the rest of the countries.

This is a first study comparing different countries and identified important findings about breastfeeding belief and feeding practice. In a pandemic situation government needs to emphasize and disseminates the importance of breastfeeding safety, especially in Asian countries. Thus, this study urges to pay special efforts on lactation support with providing information and strategies to support breastfeeding women even during the COVID-19 pandemic.

Future studies could explore the reasons of expressed breast milk instead of breastfeeding at breast, comparing government politics support, work status and health professional support.

Abbreviations

BF: Breastfeeding

CDC: Centers for Disease Control and Prevention

EBF: Exclusive breastfeeding

UK: United Kingdom

WHO: World Health Organization

Declarations

Ethics approval and consent to participate

Ethics approval was obtained from Ethical Committee of Universidade Federal de São Paulo in Brazil (n. 4.858.900), Psychiatry Nursing and Midwifery Research Ethics Subcommittee at King's College London in the UK (HR/DP-20/21-22651, RESCM-20/21-22651), Institutional Review Board of the National Yang Ming Chiao Tung University in Taiwan (n. YM110060E), Institutional Review Board of Institute for Population and Social Research at Mahidol University in Thailand (n. 2021/03-042), and Institutional Review Board of Catholic Kkottong University in South Korea (n. 2-7008080-A-N-01-202103-HR-003).

Consent for publication

Not applicable

Availability of data and materials

All data generated or analysed during this study are included in this published article.

Competing interests

The authors declare that they have no conflicts of interest. KPC is an Editorial Board member of IJB but do not participate on review this manuscript.

Funding

This research project is supported by Mahidol University, Thailand.

Author's contributions

All authors meet the authorship criteria. SAH and YSC initiated and designed this study. KPC made the preliminary draft. SAH and YSC interpreted the results and revised the manuscript. All authors read and approved the final manuscript.

Acknowledgements

We thank Associate professor Dr. Seung Chun Paek, Mahidol University for data analysis support.

References

1. Victora CG, Bahl R, Barros AJ, Franca GV, Horton S, Krasevec J, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *Lancet*. 2016;387(10017):475–90.
2. World Health Organization W, UNICEF. Global Strategy for Infant and Young Child Feeding. Geneva, Switzerland: World Health Organization; 2003.
3. Choi E, Park E, Kim H, Oh M, Lee N, Choi J. Survey on Breastfeeding in Korea, The Korean Committee for Unicef, Seoul. The Korean Committee for Unicef, Seoul; 2016.
4. McAndrew F, Thompson J, Fellows L, Large A, Speed M, Renfrew M. Infant Feeding Survey 2010: Summary. London: Health and Social Care Information Centre: Health and Social Care Information Centre; 2012.
5. Vasconcellos MTL, Silva P, Castro IRR, Boccolini CS, Alves-Santos NH, Kac G. Sampling plan of the Brazilian National Survey on Child Nutrition (ENANI-2019): a population-based household survey. *Cad Saude Publica*. 2021;37(8):e00037221.
6. Universidade Federal do Rio de Janeiro. Breastfeeding: Prevalence and practices of breastfeeding in Brazilian children under 2 years of age. Brazilian National Survey on Child Nutrition (ENANI-2019).. Eletronic report. <https://enani.nutricao.ufrj.br/index.php/relatorios/>; 2021 2021.
7. Office NS, Fund UNCs. Thailand Multiple Indicator Cluster Survey in 2019: the summary of key indicators.. Bangkok: National Statistical Office: United Nation Children's Fund; 2020.
8. Lee CC, Chiou ST, Chen LC, Chien LY. Breastfeeding-Friendly Environmental Factors and Continuing Breastfeeding Until 6 Months Postpartum: 2008–2011 National Surveys in Taiwan. *Birth*. 2015;42(3):242–8.
9. World Health Organization W. WHO Coronavirus (COVID-19) Dashboard <https://covid19.who.int>: WHO; 2022 [
10. Lubbe W, Botha E, Niela-Vilen H, Reimers P. Breastfeeding during the COVID-19 pandemic - a literature review for clinical practice. *Int Breastfeed J*. 2020;15(1):82.
11. World Health Organization W. Clinical management of COVID-19: Interim guidance (27 May 2020). Geneva, Switzerland: World Health Organization, WHO; 2020.
12. Didikoglu A, Maharani A, Pendleton N, Canal MM, Payton A. Early life factors and COVID-19 infection in England: A prospective analysis of UK Biobank participants. *Early Human Development*. 2021;155:105326.
13. Verd S, Ramakers J, Vinuela I, Martin-Delgado M-I, Prohens A, Díez R. Does breastfeeding protect children from COVID-19? An observational study from pediatric services in Majorca, Spain. *International Breastfeeding Journal*. 2021;16(1):83.
14. Center for Disease Control and Prevention C. Care for breastfeeding people. website: CDC; 2021 Jun 17, 2021.
15. Rice K, Williams S. Women's postpartum experiences in Canada during the COVID-19 pandemic: a qualitative study. *CMAJ Open*. 2021;9(2):E556-E62.
16. Swigart TM, Bonvecchio A, Théodore FL, Zamudio-Haas S, Villanueva-Borbolla MA, Thrasher JF. Breastfeeding practices, beliefs, and social norms in low-resource communities in Mexico: Insights for how to improve future promotion strategies. *PLOS ONE*. 2017;12(7):e0180185.
17. Tomori C. Overcoming barriers to breastfeeding. *Best Practice & Research Clinical Obstetrics & Gynaecology*. 2022.
18. Spatz DL, Davanzo R, Müller JA, Powell R, Rigourd V, Yates A, et al. Promoting and Protecting Human Milk and Breastfeeding in a COVID-19 World. *Frontiers in Pediatrics*. 2021;8.
19. Hoying R, Badreldin N, Shah MD, Bolden JR, Cummings P, Robinson DT. Providing Breastfeeding Support During COVID-19: A Survey of Staff Experiences. *Journal of Human Lactation*. 2022;38(1):43–52.

20. Maria Koleilat, Shannon E. Whaley, Clapp C. The Impact of COVID-19 on Breastfeeding Rates in a Low-Income Population. *Breastfeeding Medicine*. 2022;17(1):33–7.
21. Yu J, Gao M, Wei Z, Wells JCK, Fewtrell M. The impact of the Covid-19 pandemic on maternal delivery experiences and breastfeeding practices in China: data from a cross-sectional study. *BMC Pediatr*. 2022;22(1):104.
22. Tigka M, Metallinou D, Nanou C, Iliodromiti Z, Lykeridou K. Frequency and Determinants of Breastfeeding in Greece: A Prospective Cohort Study during the COVID-19 Pandemic. *Children (Basel)*. 2022;9(1).
23. Mohd Shukri NH, Gan WY, Zalbahar N, Tusimin M, Mohamad Nasri N. COVID-19 Restrictions and Maternal Experience and Infant Feeding. *Nursing Research*. 2022;71(2).
24. Katsinde SM, Srinivas SC. Breastfeeding and the sustainable development agenda. *Indian Journal of Pharmacy Practice*. 2016;9(3):144–6.
25. Pérez-Escamilla R. Breastfeeding in the 21st century: How we can make it work. *Social Science & Medicine*. 2020;244:112331.
26. WHO. Coronavirus disease (COVID-10): Breastfeeding <https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-covid-19-breastfeeding>: WHO; 2022 [
27. Wanjohi M, Griffiths P, Wekesah F, Muriuki P, Muhia N, Musoke RN, et al. Sociocultural factors influencing breastfeeding practices in two slums in Nairobi, Kenya. *Int Breastfeed J*. 2016;12:5.
28. Swain D, Parida SP, Das H. Busting of myths and misconceptions about breast feeding during COVID-19 pandemic and its societal importance: a brisk review. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2021;10(2):819.
29. Cheema R, Partridge E, Kair LR, Kuhn-Riordon KM, Silva AI, Bettinelli ME, et al. Protecting Breastfeeding during the COVID-19 Pandemic. *Am J Perinatol*. 2020.
30. Gross R, Conzelmann C, Muller JA, Stenger S, Steinhart K, Kirchhoff F, et al. Detection of SARS-CoV-2 in human breastmilk. *Lancet*. 2020;395(10239):1757–8.
31. Gribble KD, McGrath M, MacLaine A, Lhotska L. Supporting breastfeeding in emergencies: protecting women's reproductive rights and maternal and infant health. *Disasters*. 2011;35(4):720–38.
32. Vu Hoang D, Cashin J, Gribble K, Marinelli K, Mathisen R. Misalignment of global COVID-19 breastfeeding and newborn care guidelines with World Health Organization recommendations. *BMJ Nutr Prev Health*. 2020;3(2):339–50.
33. Simion F, Di Giorgio E, Leo I, Bardi L. The processing of social stimuli in early infancy: from faces to biological motion perception. *Prog Brain Res*. 2011;189:173–93.
34. Moberg KU, Prime DK. Oxytocin effects in mothers and infants during breastfeeding. *Infant*. 2013;9(6):201–6.
35. Costantini C, Joyce A, Britez Y. Breastfeeding Experiences During the COVID-19 Lockdown in the United Kingdom: An Exploratory Study Into Maternal Opinions and Emotional States. *J Hum Lact*. 2021;37(4):649–62.
36. Brown A, Shenker N. Experiences of breastfeeding during COVID-19: Lessons for future practical and emotional support. *Matern Child Nutr*. 2021;17(1):e13088.
37. Vazquez-Vazquez A, Dib S, Rougeaux E, Wells JC, Fewtrell MS. The impact of the Covid-19 lockdown on the experiences and feeding practices of new mothers in the UK: Preliminary data from the COVID-19 New Mum Study. *Appetite*. 2021;156:104985.
38. Piankusol C, Sirikul W, Ongprasert K, Siviroy P. Factors Affecting Breastfeeding Practices under Lockdown during the COVID-19 Pandemic in Thailand: A Cross-Sectional Survey. *International Journal of Environmental Research and Public Health*. 2021;18(16):8729.
39. Latorre G, Martinelli D, Guida P, Masi E, De Benedictis R, Maggio L. Impact of COVID-19 pandemic lockdown on exclusive breastfeeding in non-infected mothers. *Int Breastfeed J*. 2021;16(1):36.
40. Dong Y, Chi X, Hai H, Sun L, Zhang M, Xie WF, et al. Antibodies in the breast milk of a maternal woman with COVID-19. *Emerg Microbes Infect*. 2020;9(1):1467–9.
41. Vilar-Compte M, Gaitan-Rossi P, Rhodes EC, Cruz-Villalba V, Perez-Escamilla R. Breastfeeding media coverage and beliefs during the COVID-19 pandemic in Mexico: implications for breastfeeding equity. *Int J Equity Health*. 2021;20(1):260.

42. Hornbeak DM, Dirani M, Sham WK, Li J, Young TL, Wong TY, et al. Emerging trends in breastfeeding practices in Singaporean Chinese women: findings from a population-based study. *Ann Acad Med Singap.* 2010;39(2):88–94.
43. Bank TW, Organization IL. Labor force participation rate, female: ILOSTAT database 2022 [Available from: <https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS>].
44. Kim H, Kovach AC. Information and Social Support Regarding Breastfeeding: A Survey of Mothers in Seoul, South Korea. *J Korean Acad Nurs.* 2001;31(7):1151–9.
45. Yeo JH, Kim EY. Social policies and breastfeeding duration in South Korea: A survival analysis of the national data. *Midwifery.* 2022;107:103282.
46. Jiang B, Hua J, Wang Y, Fu Y, Zhuang Z, Zhu L. Evaluation of the impact of breast milk expression in early postpartum period on breastfeeding duration: a prospective cohort study. *BMC Pregnancy and Childbirth.* 2015;15(1):268.
47. Pang WW, Bernard JY, Thavamani G, Chan YH, Fok D, Soh SE, et al. Direct vs. Expressed Breast Milk Feeding: Relation to Duration of Breastfeeding. *Nutrients.* 2017;9(6).
48. McFadden A, Gavine A, Renfrew MJ, Wade A, Buchanan P, Taylor JL, et al. Support for healthy breastfeeding mothers with healthy term babies. *Cochrane Database Syst Rev.* 2017;2:CD001141.
49. Peven K, Purssell E, Taylor C, Bick D, Lopez VK. Breastfeeding support in low and middle-income countries: Secondary analysis of national survey data. *Midwifery.* 2020;82:102601.
50. Chang YS, Li KMC, Li KYC, Beake S, Lok KYW, Bick D. Relatively speaking? Partners' and family members' views and experiences of supporting breastfeeding: a systematic review of qualitative evidence. *Philos Trans R Soc Lond B Biol Sci.* 2021;376(1827):20200033.
51. Kounnavong S, Pak-Gorstein S, Akkhavong K, Palaniappan U, Berdaga V, Conkle J, et al. Key Determinants of Optimal Breastfeeding Practices in Laos. *Food and Nutrition Sciences.* 2013;4:61–70.
52. Thepha T, Marais D, Bell J, Mauangpin S. Facilitators and barriers to exclusive breastfeeding in Thailand. A narrative review. *J Comm PubHealth Nurs.* 2017;3(1):160.
53. Keevash J, Norman A, Forrest H, Mortimer S. What influences women to stop or continue breastfeeding? A thematic analysis. *British Journal of Midwifery.* 2018;26(10):651–8.
54. Gavine A, Marshall J, Buchanan P, Cameron J, Leger A, Ross S, et al. Remote provision of breastfeeding support and education: Systematic review and meta-analysis. *Matern Child Nutr.* 2021:e13296.
55. Greenhalgh T, Wherton J, Shaw S, Morrison C. Video consultations for covid-19. *BMJ.* 2020;368:m998.
56. Ceulemans M, Verbakel JY, Van Calsteren K, Eerdekens A, Allegaert K, Foulon V. SARS-CoV-2 Infections and Impact of the COVID-19 Pandemic in Pregnancy and Breastfeeding: Results from an Observational Study in Primary Care in Belgium. *Int J Environ Res Public Health.* 2020;17(18).
57. Schindler-Ruwisch J, Phillips KE. Breastfeeding During a Pandemic: The Influence of COVID-19 on Lactation Services in the Northeastern United States. *J Hum Lact.* 2021;37(2):260–8.
58. Ahmad RS, Sulaiman Z, Nik Hussain NH, Mohd Noor N. Working mothers' breastfeeding experience: a phenomenology qualitative approach. *BMC Pregnancy and Childbirth.* 2022;22(1):85.
59. Shakya P, Kunieda MK, Koyama M, Rai SS, Miyaguchi M, Dhakal S, et al. Effectiveness of community-based peer support for mothers to improve their breastfeeding practices: A systematic review and meta-analysis. *PLoS One.* 2017;12(5):e0177434.
60. Chang Y-S, Beake S, Kam J, Lok KY-W, Bick D. Views and experiences of women, peer supporters and healthcare professionals on breastfeeding peer support: A systematic review of qualitative studies. *Midwifery.* 2022;108:103299.
61. Chang SM, Rowe J, Goopy S. Non-family support for breastfeeding maintenance among career women in Taiwan: a qualitative study. *Int J Nurs Pract.* 2014;20(3):293–301.

Figures

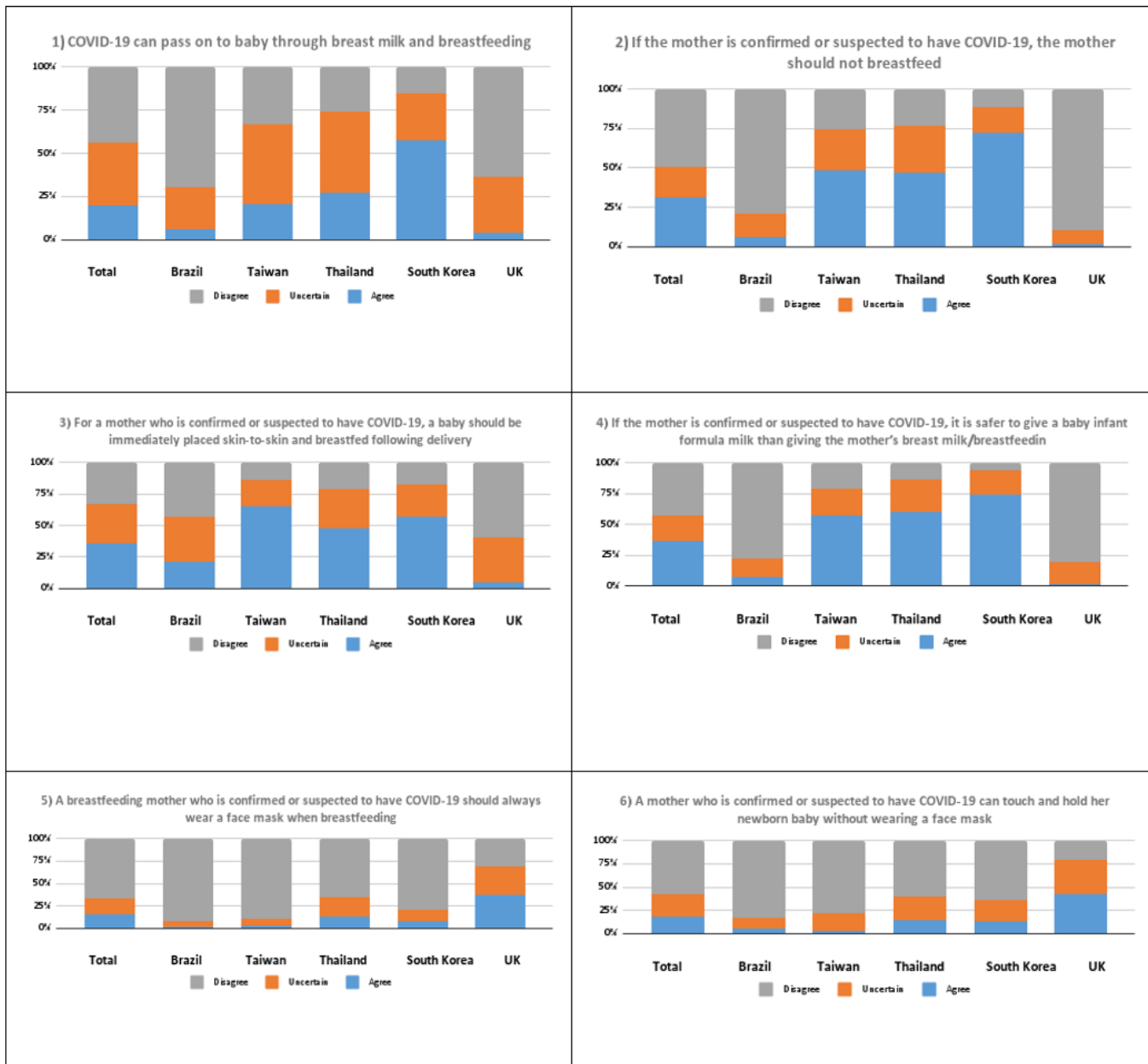


Figure 1

Belief towards breastfeeding during the covid-19 pandemic by Brazil, Taiwan, Thailand, South Korea, UK