

A Metanalysis of Trends in Knowledge and Practice of Breastfeeding in Egypt: A Case Study from the Eastern Mediterranean Region

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Abstract

Introduction: Considerable global and country efforts have been made in the past three decades to promote breastfeeding through extending exclusive breastfeeding (EBF) to six months and revising the Ten steps of the Baby Friendly Hospitals Initiative (BFHI). **Aim:** To assess impact of promotion efforts of the World Health Organization (WHO) and UNICEF on the trends in knowledge and practice of Egyptian mothers towards EBF and practices of BFHI. **Methods:** This is a metanalysis study of pooled data from local research. A search for the current and past research focused on EBF and BFHI practices was performed through Egyptian University Libraries of Higher education, google and PubMed for using keywords of knowledge and practices about early infant feeding practices over the past 15 years in Egypt. Raw data were pooled for metanalysis. Twenty-four studies were identified: 12 studies from 2008 to 2018 and 12 studies from 2018 to 2022 which allowed for pooled data for 9685 mothers. **Findings:** Trends increased for knowledge and practice towards EBF, importance of colostrum and hazards of supplementation but not for early initiation of breastfeeding (EIBF) which decreased. Donated supplies of milk formula to hospitals increased. Trend in practices for offering supplements, and feeding bottles with breastfeeding decreased with increase in EBF at birth but with increase in pacifier use. EIBF through skin-to-skin (STS) remains abstinent. Illiteracy and incomplete education are still high among housewives who do not get any sustenance from the government. **Conclusions:** Trends show support of the WHO recommendations of EBF for 6 months. EIBF and STS remain a challenge. The rights of women in breastfeeding support and protection are far from adequate to meet the rising trends in marketing of milk formula. Low literacy, disempowerment and lack of support remain barriers to EBF and continued breastfeeding for two years.

Keywords

Exclusive Breastfeeding, Knowledge and Practice, Trends, Revised Ten Steps, Baby-Friendly Hospital Initiative, Metanalysis, Mothers, Allowance

1. Introduction

The Global Strategy of Infant and Young Child Feeding is a World Health Assembly (WHA) resolution of the World Health Organization (WHO) that recommends exclusive breastfeeding (EBF) for the first six months and continued breastfeeding (CBF) for two years or more (WHO, 2002) as the unequalled way of nutrition for ensuring health, growth and development of infants and maternal health (Victora et al., 2016). The Baby-Friendly Hospital Initiative (BFHI) is based on the Ten steps as best maternity practices that can influence successful breastfeeding initiation and continuation (WHO, 1989) and the Innocenti declaration in 1991 and 2005 (UNICEF, 1991; UNICEF, 2005). The WHO has revised the Ten steps in 2018 to meet the updates in evidence-based research (WHO, 2017b). Implementation guidelines were set for practice and for the promotion of breastfeeding (WHO, 2018).

EBF is defined as providing infants with only breastmilk without the addition of water, herbal preparations or food, except for vitamins, mineral supplements and medicine. It is recommended to breastfeed exclusively at birth and for the first six months of life, unless there are medical indications, for which the ideal substitute is mother's expressed milk or donor milk from another mother (WHO, 2017a). Industrialized formula milk should not be the norm and carries many immediate and long-term risks to babies (Victora et al., 2016). Non-exclusive breastfeeding can increase the risk of dying due to diarrhoea or pneumonia by more than two-fold among infants aged 0 - 5 months (WHO, 1989). It is estimated that every day, as many as 4000 infants and young children or more die worldwide because they are not breastfed (WHO, 2018). Moreover, recent studies indicated that increases in the rate of non-communicable diseases such as diabetes, obesity, autoimmune disorders, and cardiovascular disease (CVD) is likely associated with a decrease in the practice of breastfeeding (Victora et al., 2016). There are various factors that affect the decision regarding the initiation and duration of EBF, including sociodemographic factors including education level, income, cultural beliefs, employment policies, and health- and biosocial factors (Abul-Fadl et al., 2019).

In Egypt, the national rates of EBF rates have been shown by the Egypt Demographic survey in 2014 to decline progressively over the first months of life to reach 13% at 5 - 6 months (EDHS, 2015). The decline is attributed to poor knowledge and prevailing misconceptions, and pressures from social networks and media that result in poor practice. Many studies on knowledge, attitude and practice (KAP) have been conducted in Egypt to assess the gaps between know-

ledge and practice in relation to EBF and CBF. Furthermore, in 2002 the global recommendation of EBF for 4 - 6 months was changed to EBF to 6 complete months (180 days) (WHO, 2002). Also in 2018 the ten steps of the Baby-Friendly Hospital Initiative (BFHI), issued in 1991, were updated and revised. The focus was on making protection of breastfeeding a priority by making adherence to the Code in Step 1 and in steps 4, 8 and 9 for supporting early initiation of breastfeeding (EIBF) through skin-to-skin (STS), guiding feeding through baby cues, and informing mothers of the hazards of artificial nipples in feeding and as pacifiers (WHO, 2018). The change in the global recommendations may have confused health professionals who may be following outdated guidelines and thereby interfering with the implementation of successful breastfeeding. It is important to study how all these changes influenced mother's knowledge and practice towards EBF and CBF over the past years.

The aim of the present study is to review and compile data from KAP studies of mothers in Egypt that were conducted over the past one and half decades in order to compare trends after the new recommendations of the WHO and United Nations International Children's Emergency Fund (UNICEF) for EBF and the revised WHO/UNICEF "Ten steps" of the BFHI, also to assess country progress in practices that promote breastfeeding as an indicator of maternal and child health. This can be useful for guiding policies and developing strategies for promoting and supporting EBF and CBF for two years in the Eastern Mediterranean region (EMR) taking Egypt as a case study.

2. Methods

The overall aim was to assess the gap between the knowledge and the practice towards practices linked to the Ten steps which include adherence to the Code, antenatal education, knowledge about the benefits and importance of EBF, EIBF with or without STS, learning and guidance to the skills of breastfeeding, and maintenance of breastfeeding through milk expression and the management of breastfeeding problems, introduction of supplements, cue feeding, rooming-in and education on harms and avoidance of bottles and pacifiers, and hospital practices to accepting of free supplies.

Selection of the studies: The inclusion criteria for the studies were: 1) Studies conducted over the period from 2008 to 2022. 2) Studies that involved examining the knowledge, attitudes or and practices towards EBF or CBF or both. 3) Studies that involved healthy breastfeeding mothers that had breastfed their children over the past 3 - 5 years and who were in the child bearing age and were living in any part of Egypt. Exclusion criteria included studies conducted before this period or conducted with sick mothers and sick babies or those who were exposed to an education intervention in breastfeeding except if the KAP of the mothers before the intervention was taken. The year 2008 was assigned as it gives a five year period between the 2003 recommendation for EBF for six months, since studies published in 2008, would have reflected the five periods before this

date.

Search process: Only research conducted for Egyptian mothers over the past 14 years (2008 to 2022) with raw data was included to allow for pooling of data into a meta-analysis study. A search for the current and past research in breastfeeding was performed through Egyptian university libraries of Higher education, google and pubmed for using key words of knowledge, attitudes and practices about early infant feeding practices and breastfeeding. The search was confined to research conducted after the year 2008. Key words used included breastfeeding, infant feeding, knowledge, attitude and practice of mothers towards perinatal practices, exclusive breastfeeding, continued breastfeeding and employed or working mothers. Once the study was identified visits were made to the university library that held the study thesis or research. This involved travelling to several regional universities in the country to access the original work or thesis from the local library. Each thesis was reviewed and if applicable and relevant to the inclusion criteria the raw data was obtained after the necessary logistics applied to the access and use of unpublished thesis. There were many challenges and restrictions to access and retrieve the material. Moreover, the material was not accessed free and payments were made to retrieve the thesis.

The pooled data included 9685 mothers. Data that were included in meta-analysis were derived from the following studies: Group I (studies from 2008 to 2018 by author, year of publishing and sample size): [Gonaid, 2008](#) (370 mothers); [Abul-Fadl, 2008](#) (1053); [Said, 2020](#) (400 mothers); [Al-Ghwass and Ahmed, 2011](#) (1059 mothers); [El-Samnie, 2012](#) (200 mothers); [Ahmed, 2013](#) (355); [Ahmed, 2015](#) (80 mothers); [Esmael, 2015](#) (210 mothers); [Abou-Hadida, 2015](#) (200 mothers); [Hammouda, 2015](#) (300) responses (current and previous mothers); [Mohamed, 2016](#) (1502 mothers); [Metwally, 2018](#) (100 working mothers) with a total of 5829 mothers. Group II included: [Elbadawy, 2020](#) (350); [Harraz, 2020](#) (200); [Aboelnasr, 2020](#) (200); [Abdel-elwadood, 2020](#) (360); [Ellakany, 2016](#) (445); [El-Gilany, 2022](#) (884); [Mostafa, 2022](#) (140); [El-Khalaf, 2021](#) (300); [Frag, 2020](#) (400); [Ahmed, 2020](#) (200); [Aboarab, 2020](#) (180); [Tawfik et al., 2019](#) (197) with a total of 3856 mothers.

Analysis: Compilation of the data of each research was done in excel sheet of Microsoft word 2019. This also allows statistical analysis. Descriptive statistics was done using percent distribution and graphic presentation to compare the different periods i.e. 2008 to 2016 with studies from 2016 to 2022. A meta-analysis is a statistical analysis that combines the results of multiple scientific studies. Meta-analysis was performed for the KAP studies addressing the same question, however with each individual study reporting measurements that are expected to have some degree of error. Although 24 studies were identified the items in the KAP studies were not covered by all the studies. Items were covered by studies ranging from 2 to 18 studies and with population size of a minimum of 360 (for one item) to a maximum of 6271 mothers. In the subgroups there was a minimum of 200 for one item to a maximum of 4080 mothers.

3. Results

Altogether 24 studies were identified with a total of 9685 mothers. Comparison was made between the 12 studies from 2008 to 2016 that included 4770 mothers and 12 studies from 2016 to 2022 that included 3856 mothers with a total of 8626 responses. This allowed pooling of data from 8826 women who relayed their experiences of knowledge and practice towards early breastfeeding. The educational level of the mothers is from all the studies. It shows that 1636 (17.6%) were illiterate, 1906 (20.5%) had primary education, 4102 (44.2%) had secondary education and 1675 (18.04%) had higher or university education. The total mothers assessed for education was higher than that for items under study due to the drop out in data. The working status of 7241 mothers was 31.8% with 68.2% who were housewives. The ages ranged from 18.5% for mothers below 20 years, 52.3% for mothers aged 20 - 30 years and 29.2% for those over 30 years of age. This was for a sample of 3379 mothers from studies who took identical cut-offs.

Table 1 compares the knowledge of mothers about the benefits and practices

Table 1. Trends in the knowledge gained or acquired about the importance of breastfeeding and its practice between the period 2008 to 2018 and the period 2019 to 2022 through pooled data from Egyptian KAP studies.

Sample size	2008 to 2016 (12 studies)			2019 to 2022 (12 studies)			Total responses	Study sample	%
	No.	Pooled sample	Percent	No.	Pooled sample	Percent			
		5829			3856			9685	
<i>Received health education</i>	256	455	56.3	573	977	58.6	829	1432	57.9
<i>Benefits to Baby</i>	1023	1703	60.1	883	1725	51.8	1906	3428	55.6
<i>Benefits to Mother</i>	698	1803	38.7	609	1495	40.7	1307	3298	39.6
<i>EBF/ Colostrum</i>	364	1157	31.5	952	1150	82.8	1316	2307	57.04
<i>Rooming-in</i>	176	590	29.8	-	-	-	176	590	29.8
<i>EBF/ first 6 months</i>	273	900	30.3	674	1090	61.8*	947	1990	47.6
<i>EIBF</i>	502	1115	45	203	400	50.7	705	1515	46.5
<i>STS stabilizes breathing</i>	479	1373	34.9	-	-	-	479	1373	34.9
<i>STS provides warmth</i>	679	1373	49.5	-	-	-	679	1373	49.5
<i>Demand/ cue feeding</i>	1141	1443	79.1	433	645	67.1	1574	2088	75.4
<i>How to breastfeed</i>	124	220	56.4	30	200	15	154	420	36.7
<i>Harm of Bottles</i>	579	1153	50.2	196	445	44.04	775	1598	48.5
<i>Hazards of formula</i>	671	1353	45	818	985	70*	1489	2338	63.7
<i>Harms of Pacifiers</i>	583	1353	43.1	184	445	41.3	767	1537	49.9
<i>Managing BF problems</i>	91	570	15.9	534	745	71.6	624	1315	47.5
<i>Continuity of BF to 2 years</i>	149	280	43.1	485	1085	44.7	634	1365	46.4

EBF: exclusive breastfeeding at any point of time from birth to six months; EIBF: early initiation of breastfeeding in the first hour after delivery; STS: skin to skin contact between mother and baby; BF: breastfeeding.

linked with EBF and CBF between the period 2008 to 2018 and the period 2019 to 2022 through pooled data from Egyptian KAP studies. There was no significant difference between the periods in any of the items under study $P > 0.05$. **Table 2** compares the practices related to clinical procedures (steps 3 to 9 of the ten steps) between the period 2008 to 2018 and the period 2019 to 2022 through pooled data from Egyptian KAP studies. There was no significant difference in the practices except for EBF and EIBF at $P < 0.05$. **Figure 1** illustrates the trends in education of mothers about the Benefits of Breastfeeding and Early Breastfeeding Practices in Egypt for the period from 2008 to 2016 and from 2019 to 2022 in Egypt. **Figure 2** compares the trends in awareness about practices that support breastfeeding continuity from studies covering the periods from 2008 to 2016 and from 2019 to 2022 in Egypt. **Figure 3** compares the trends in awareness about practices that support breastfeeding continuity from studies covering the periods from 2008 to 2016 and from 2019 to 2022 in Egypt. **Figure 4** illustrates the gap in knowledge and practice for EBF and EIBF over the past 15 years (2008 to 2022). As shown by the pooled data for the years from the studies recruited in the metanalysis. **Table 3** presents the awareness and knowledge of mothers about local national laws supporting breastfeeding from an individual study by [Metwally \(2018\)](#).

Table 2. Comparison of practices related to clinical procedures (steps 3 to 9 of the ten steps) between the period 2008 to 2018 and the period 2019 to 2022 through pooled data from Egyptian KAP studies.

Period	2008 to 2018			2019 to 2022			Total		
	No.	Pooled sample	Percent	No.	Pooled sample	Percent	No.	Pooled sample	Percent
<i>Sample size</i>		5829			3856			9685	
<i>Prelacteals offered</i>	1973	3401	49.2	929	2234	14.1	2902	5635	51.5
<i>EBF</i>	1529	5645	27.1	742	1630	45.5	2271	7275	31.2
<i>EIBF</i>	1810	3057	59.2*	1179	3214	36.7	2989	6271	47.7
<i>STS at birth any duration</i>	66	300	22.0	0	360	0	66	660	10
<i>On-Demand/ Cue feeding</i>	2002	2447	81.8	909	1290	70.5	2911	3737	77.9
<i>Rooming in</i>	727	1145	63.5	330	360	91.7	1057	1505	70.2
<i>Bottles</i>	1267	4080	31.05	615	1300	47.3	1882	5380	34.9
<i>Pacifiers</i>	1400	2478	56.5	264	550	48	1664	3028	54.9
<i>How to breastfeed</i>	359	1035	34.7	426	780	54.6	785	1815	43.25
<i>How to express milk</i>	683	2008	34	247	680	36.3	930	2688	34.5
<i>How to store EBM</i>	22	200	11	257	500	51.4	277	700	39.6
<i>How to manage breast problems</i>	519	1153	45.01	-	-	-	519	1153	45.01
<i>Offered formula in hospital</i>	22	300	7.3	322	400	80.5	344	700	49.1

EBF: exclusive breastfeeding, EIBF: early initiation of breastfeeding in the first hour after delivery; STS: skin to skin contact between mother and baby; BF: breastfeeding.

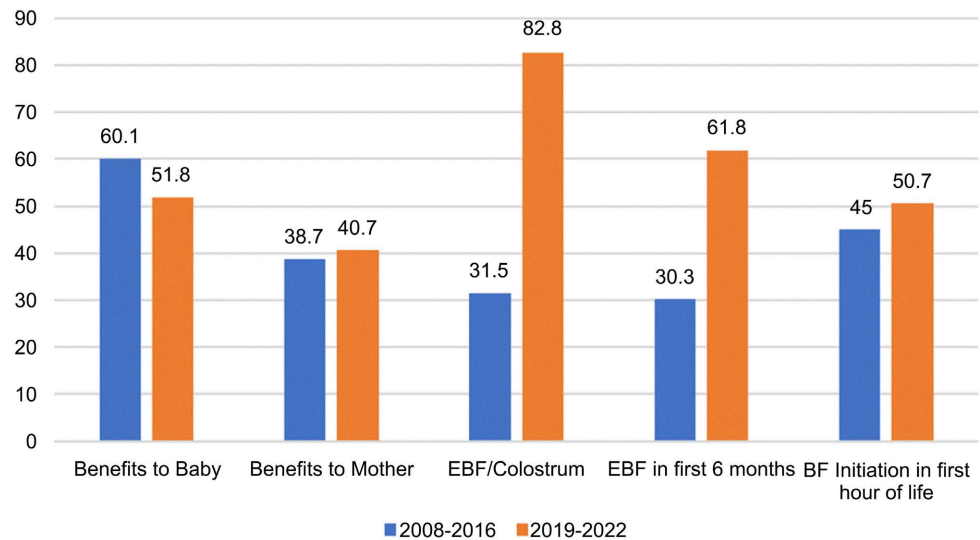


Figure 1. Trends in knowledge about the benefits of breastfeeding and early feeding practices for the periods from 2008 to 2018 and 2019 to 2022 in Egypt. EBF: Exclusive breastfeeding, EIBF: Initiating breastfeeding within the first hour of delivery.

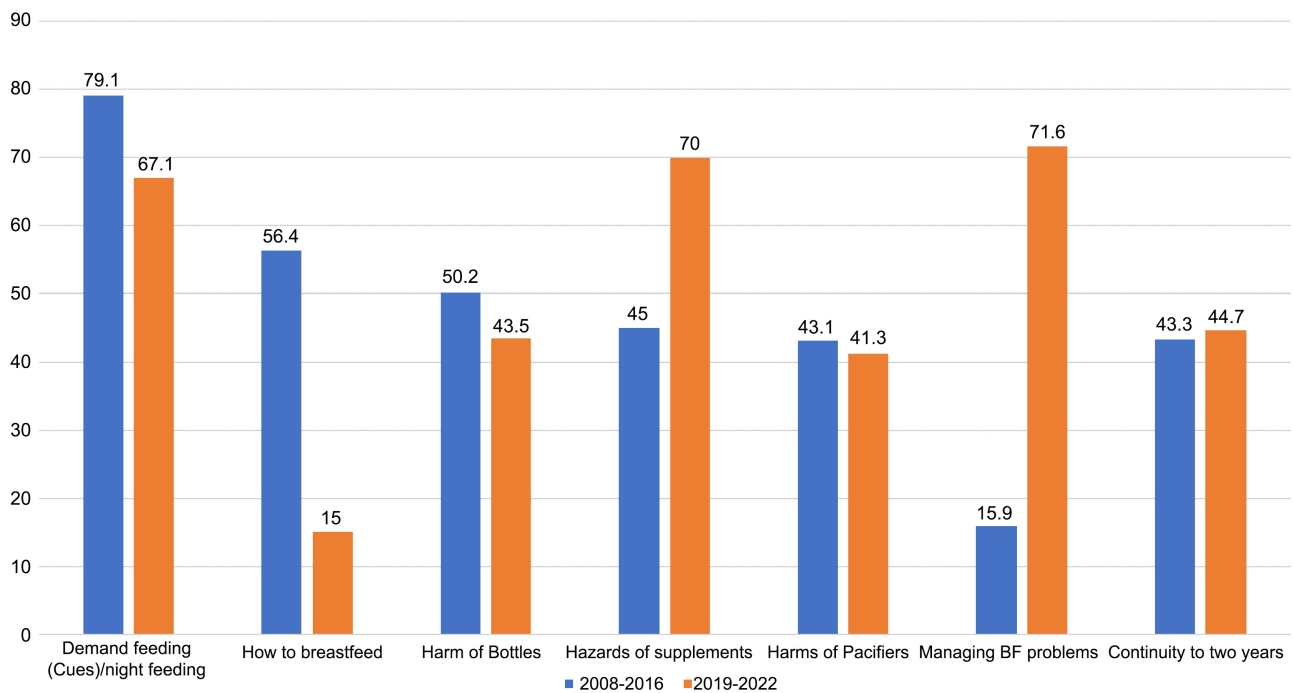


Figure 2. Comparison of trends in knowledge of practices that support exclusive and continued breastfeeding by pooled data from studies covering the periods from 2008 to 2018 and 2019 to 2022 in Egypt.

4. Discussion

In general the study showed that there are increasing trends in knowledge and practice with regards EBF for 6 months, importance of colostrum and hazards of supplementation but not EIBF which decreased over the past 5 years compared to the preceding 10 years as shown in **Table 1** and **Table 2** and **Figure 1** and **Figure 2**. Knowledge gaps that still remain pertain to the growing evidence of

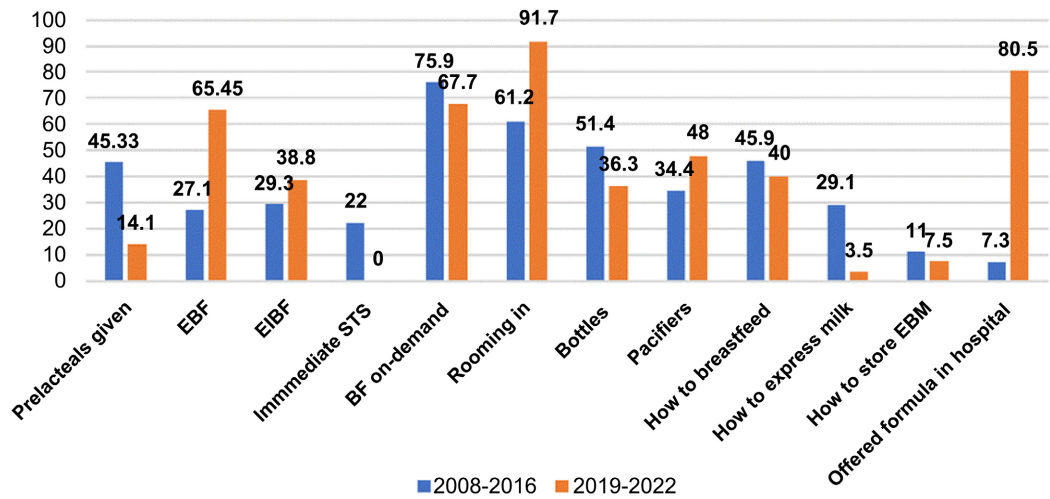


Figure 3. Comparison of trends in practices that support exclusive and breastfeeding continuity from studies covering the periods from 2008 to 2018 and 2019 to 2022 in Egypt.

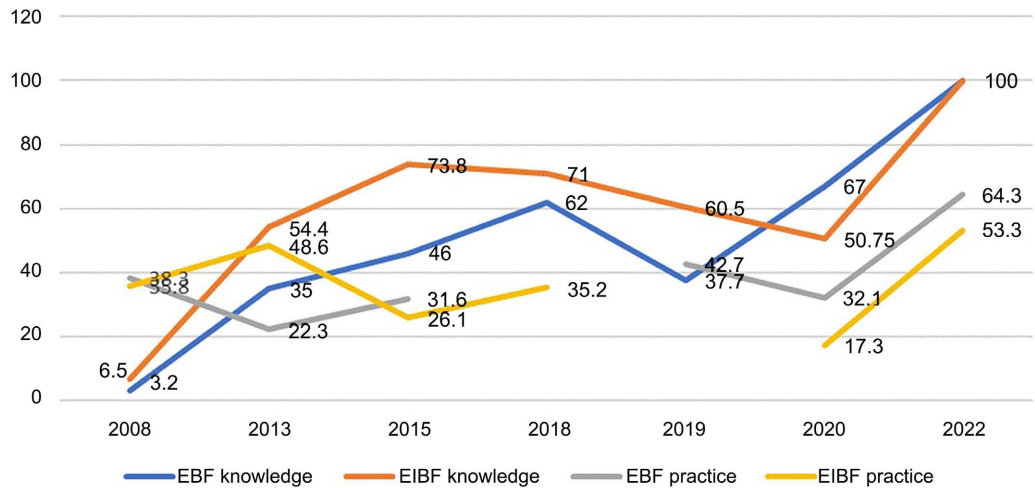


Figure 4. Trends in gap between knowledge and practice for exclusive breastfeeding and early initiation of breastfeeding.

Table 3. Knowledge and attitude of mothers about national laws supporting working mothers.

Maternity support Parameter			
Mothers who are aware about:	Yes	No	Total
Labor laws that support pregnant and breastfeeding working mothers	22	78	100
laws prevent working overtime for lactating mothers	25	75	100
Break of one hour/day during working hours for breastfeeding	2	98	100
Maternity leave is paid on monthly basis	95	5	100
Mothers who are satisfied with maternity leave duration	2	98	100

Source: Metwally, 2008.

the diseases that can be prevented by EBF for baby and mother, the hazards of formula feeding and of pacifiers. The decrease in cue feeding can be explained by increase in pacifier use and thereby mothers cannot recognize and respond to feeding needs of their baby as shown in **Figure 2**.

Also many of the practices that fit with the ten steps have increased as shown in **Figure 3**. Education of the pregnant women about breastfeeding has increased. Also there should be more emphasis on the benefits and importance of early initiation of breastfeeding immediately after birth through skin to skin and its benefits to the mother and the baby.

It is expected that in Arab countries women would breastfeed longer because of Islamic teachings that consider breastfeeding as the Child's God-given right, and continuity of breastfeeding to two years is encouraged, yet many women stop breastfeeding early. Studies conducted in Arab countries report the high prevalence of misconceptions among mothers about breastfeeding that include: inherited inability to produce milk, having "bad milk", and nutritional value or supposed health risks of colostrum (Abdul-Ameer et al., 2008). Understanding cultural values, beliefs, and practice of breastfeeding among Arab mothers during the postpartum periods are necessary for the initiation and sustainment of successful EBF. Even Arab mothers living in Western cultures are strongly influenced by the aggressive marketing of formula and feel that it is ideal and can assist with their milk. They also maintain their own traditions of giving herbal drinks so they expose their babies to the double jeopardy of both Western and Eastern malpractice that impedes early EBF and continuity of breastfeeding for longer periods (Dorri et al., 2021).

Early initiation through skin-to-skin (STS) contact from birth has been shown to be the greatest challenge. Many barriers face this practice although it is a lifesaving and instinctive practice that happens when mothers experience self-controlled birth. Few studies assessed KAP towards STS and found that only some mothers perceived it as a mode for bonding and warmth to the baby, while few or none understood its lifesaving and role in stabilizing oxygenation, heart rate and breathing. The technique was usually incomplete and the actual stages in which the child progressed from awakening to suckling at the breast were not described except in two case-control studies that evaluated the implementation of this procedure in Egyptian maternity hospitals. Even in the intervention studies none of the mothers completed the procedure for one hour or up to the first suckle at baby's own will, probably due to the use of intrapartum medications and intervening cultural barriers of both mothers and staff (EL-Deeb, 2009). Unfortunately, this unique event is controlled by high-tech staff whose understanding of normal labor is limited to their knowledge of medical interventions to prevent and manage complicated labor rather than to use this knowledge to support and enhance the normal physiological processes of labor.

The lack of early STS compounded by delayed initiation leads to the early supplementation of babies with drinks other than colostrum. Our study showed

that trends in delayed initiation of breastfeeding (after one hour) and feeding of early supplements with breastfeeding (prelacteals) have not changed much since the implementation of the new guidelines. Moreover the analysis revealed a substantial increase in milk supplies that were given and distributed through health facilities in the more recent years. The new guidelines, for the revised ten steps, make compliance to the code a top priority for the facility to become Baby-friendly. Egyptian government is committed to controlling and reducing the distribution of subsidized IM through health facilities and prohibits any advertising. Yet the aggressive marketing of milk formula continues to invade hospital practices and influence the minds of mothers and health professionals in an exploitative and evasive manner as shown in this study. In many settings there are no set standards of care for lactation management the laboring woman and her newborn as one unit; this is divided between the pediatrician and obstetrician, unlike the certified midwife or lactation specialist who is able to give comprehensive care to both mother and baby and refer to other specialists when needed. Evidence shows that delayed breastfeeding initiation affects infant survival as a delay of 2 and 23 hours after birth resulted in a 33% greater risk of dying compared to babies who were breastfed at birth (Smith et al., 2017). Also, among newborns who started breastfeeding 24 hours or more after birth, the risk was more than twice as high (Khan et al., 2015). In the EMR countries a review of early breastfeeding practices (Al-Jawaldeh et al., 2021) showed that enacting the code (WHO, 1981; WHO, 2017a) by effective national laws influences trends in exclusive breastfeeding particularly in the EMR region where EBF and EIBF face many challenges (Al-Jawaldeh et al., 2019).

An intervention to promote STS was done in Egypt through two 5-day training mechanisms: an immersion method which we developed that took place on site in one hospital (Practice, Reflection, Education and training, Combined with Ethnography for Sustainable Success (PRECESS)) and the 20-hour WHO/UNICEF training course for the Baby-Friendly Hospital Initiative (BFHI) by a collaborative Egyptian, U.S., and Swedish teams of experts (Abul-Fadl et al., 2012). The intervention was later evaluated through a baseline survey supported by UNICEF and the Ministry of Health that found a marked improvement in knowledge and practice of the hospital whose staff had experienced the full intervention versus hospitals that received only the BFHI training (Brimdyr et al., 2012) Such interventions indicate that promotion of EIBF through STS requires innovative communication strategies to improve the practices of STS, early initiation and continued EBF from birth (Al-Jawaldeh et al., 2019). The challenge remains even with the back-up support from religious Islamic teachings that empower continued breastfeeding by a breastfeeding mother or wet nurse for whole two years (Shaikh & Ahmed, 2006).

Practices of demand feeding have decreased and but rooming-in has increased. Actually none of the studies addressed cue feeding before 2018, the focus was on demand (unrestricted) feeding and night feeds. Studies on the neo-

natal feeding responses acquired during STS and its effect on continued EBF were not addressed in the studies reviewed. Moreover education about the technique of breastfeeding in relation to positioning, attachment, milk expression, storage of milk and cup feeding was shown to be low over the entire period, decreasing more recently. Managing breast problems and continued breastfeeding when mothers developed a breast condition or when baby was sick was high but continuity when mother was sick was low. Mother's knowledge on how to increase her milk supply by increasing night feeds and frequency of feeding was shown by some of the reviewed studies to increase. Overall knowledge is higher with higher level of education of mothers, but optimum practices are impeded by their dual responsibilities of working career and parenting especially when social support is lacking. The evaluation of the PROBIT study in Belarius demonstrated links between BFHI and longer EBF duration (43.3% vs 6.4% at 3 months), reductions in gastrointestinal episodes and rashes, higher verbal IQ scores, and longer EBF rates for subsequent children (Martens, 2012). In a more recent study in Chinese mothers who practiced the combination of EIBF, breastfeeding on demand and never using a pacifier or no fewer than seven baby-friendly practices were about 1.7 times less likely to continue EBF for longer periods than 3 months (Zhang et al., 2020). However, meta-analysis and systemic review have shown that a multifaceted approach of implementation during both the prenatal and postnatal periods increased the rate of EBF by 3.3 times at 6 months (Kim et al., 2018) and community outreach counseling (Kimani-Murage et al., 2017). However the higher level of education and in particular maternal health literacy level was shown to significantly increase EBF to 6 months (Valero-Chillerón et al., 2022). Maternal health literacy is defined as the acquisition of required cognitive and social skills to enable women to access, understand, appraise, and use the information needed to maintain and enhance their health conditions (Liu et al., 2020). In Egypt nearly 28% of the population especially in slum and rural areas are illiterate. Poor quality of education, poverty and the high costs of education contribute to the problem of illiteracy in young girls and women who are most affected by lack of the literacy programs due to gender and cultural limitations. A study in Cairo in Ain Shams University Hospital showed that 81% of attendees of outpatient clinics, mostly females, had low health literacy levels in general (Almaleh et al., 2017). Maternal health literacy is an effective tool for women to advocate for their rights during pregnancy, childbirth, paid maternity leave and substance support for housewives for breastfeeding their infants and not subsidizing infant milk formula (Tavananezhad et al., 2022). The WIC program in the USA is an example of how breastfeeding is supported through free rentals of pumps and WIC food package for breastfeeding moms (USDA, 2022). However it inadvertently also distributes infant milk formula and this creates conflicting messages and frustrates staff who have been trained in breastfeeding promotion (Reifsnider et al., 2003).

Many of the women assessed in the studies analyzed were not working mothers i.e. not paid working mothers. Moreover many mothers were of a younger

age group and had not completed their education. Although breastfeeding is a full-time job, yet these women are not earning a living and are dependent on the male partner, which restricts their ability to provide for their needs. This in itself is disempowering to these women and indicates that they are economically deprived. In many developed countries, mothers are provided with annuities or compensations to encourage them to support themselves and meet their needs. In Egypt, these allowances are only paid to working women as a paid maternity leave but not as an allowance for breastfeeding. Women should be paid an allowance during breastfeeding particularly in the first two years of life, whether working or not working.

The pooled data from the study showed that one-quarter to one-third of the women were illiterate. This high illiteracy rate further disempowers women especially since many of these women are still young in their reproductive years and will be sharing in the responsibility of the learning process of their children as well as ensuring their protection. Illiteracy increases poverty and is a barrier to achieving the sustainable development goals for innovation, industry, controlling consumption and enhancing world resources and equity (Skafida, 2012). Moreover, the percent of women in higher education was minimal, indicating that many of the women who are taking roles of child rearing and nurturing have not reached higher levels of education.

Educated mothers are more likely to be employed and thereby despite having a paid maternity leave are more likely to stop breastfeeding earlier than housewives because of the short maternity leave. A study in Scotland showed that employed mothers had a higher risk of earlier breastfeeding cessation than housewives or self-employed mothers (Shaefer et al., 2018). In 2005, Scotland became the first nation to make breastfeeding in public a legal right. Under the social security scheme in the UK women are entitled to statutory maternity pay (SMP) if employed or maternity allowance if self-employed or having a low income (UK Gov). For populations where Islam prevails, women are, under the constitutional law which is derived from the Shareia (Islamic teachings), allowed an extended maternity leave for two years that are unpaid. Islam has traditionally provided an allowance from the “House of Finance” to nursing mothers. Hence Islamic teachings can be used to advocate and support breastfeeding rights of women in the EMR countries to financial allowance and maternity leave for working and non-working mothers caring for breastfeeding infants, as mentioned in the Quran (*The Holy Quran: Surat 2. Al Bakara: verse 233, Surat Luqman: verse 14 and Surat Al-Ahkaf: verse 15*). The quranic verses recommend a 2-year period of lactation during which a nursing mother is entitled to receive tangible and financial compensation from the father (or those responsible for the child) for nursing the child. If the baby is given to a wet nurse, she also should be paid a fee for nursing the child. Family allowance directed to women can reduce poverty (Shaefer et al., 2018). Moreover, this allowance should be solely for the woman and not given as part of the household income and be added to the wages of men. This is mentioned in the Quran in Surat An Nisa Verse (19): “O you

who have believed, it is not lawful for you to inherit women by compulsion. And do not make difficulties for them in order to take (back) part of what you gave them unless they commit a clear immorality. And live with them in kindness.” Even if they divorce the breastfeeding mother, she is entitled to an allowance for breastfeeding or if she is unable to breastfeed then the allowance is given to the wet nurse (Surat Al Talak; verse 6: “*Lodge them (in a section) of where you dwell out of your means and do not harm them in order to oppress them. And if they should be pregnant, then spend on them until they give birth. And if they breastfeed for you, then give them their payment*”). Formula feeding is not mentioned in the Holy teaching of the Quran as a replacement for breastfeeding and therefore it is not legible to be subsidized (Shaikh & Ahmed, 2006). Yet some countries as Egypt and Kuwait subsidize this milk and this encourages women to opt off breastfeeding and feed their baby milk formula. Again this is one of the many ways formula milk companies have exploited the rights of women to breastfeed and twisted their cultural beliefs to suit their lavish greed.

Limitations: The lack of consistency in the interview formats used to collect information from mothers about their KAP towards EBF remains an impediment to studying trends in mother’s KAP towards EBF. The practice of EBF was taken at any point of the study as a concept and does not reflect EBF for six months. We were unable to get the same information in the same manner from all the studies and hence the information lacked consistency, such data was omitted and therefore not all the data were included from all the studies. More studies that follow standard interview formats to study the knowledge, attitude and practice of EBF are needed.

Conclusions: Overall trends in knowledge and practice for the concept of EBF are on the rise but not EIBF which decreased over the past years and is not associated with the practice of STS or guidance to cue feeding. The studies showed a considerable gap between knowledge and practice. Factors that impede optimum breastfeeding practices include poverty, early marriage, incomplete years of education and lack of social and financial support to working and non-working breastfeeding women. Adequate EIBF through optimum STS contact can empower the mothering abilities of women through bonding and instinctive behavior towards their babies. Women empowerment through mainstream education, offering allowance support to all mothers rather than subsidization of formula milk, prenatal education, media awareness, and control of exploitative marketing practices are mainstay for protecting, promoting and supporting breastfeeding.

Disclaimer

The content, views and recommendations in this article do not represent World Health Organization and are solely the responsibility of the authors.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this pa-

per.

References

- Abdel-elwadood, A. M. M. (2020). *Factors Associated with Postpartum Maternal-Infant Bonding*. Master Thesis in Obstetrics and Gynecology Nursing, Faculty of Nursing, Alexandria University.
- Abdul-Ameer, A. J., Al Hadi, A. H. M., & Abdulla, M. M. (2008). Knowledge, Attitudes and Practices of Iraqi Mothers and Family Child-Caring Women Regarding Breast-feeding. *Eastern Mediterranean Health Journal*, 14, 1003-1014.
- Aboarab, Z. A. E. (2020). *Prevalence and Predictive Factors for Breastfeeding in the First 6 Months among Mothers Attending Primary Health Care Centers in Cairo, Egypt*. Master Thesis in Family Medicine, Faculty of Medicine, Ain Shams University.
- Aboelnasr, M. A. (2020). *Determinants of Breast Problems among Lactating Women*. Master Thesis in Obstetrics and Gynecology Nursing, Faculty of Nursing, Alexandria University.
- Abou-Hadida, R. M. M. (2015). *Maternal Breast-Feeding Practices among Employed and Unemployed Mothers in Alexandria*. Master Thesis in Pediatric Nursing, Faculty of Nursing, Alexandria University.
- Abul-Fadl, A. (2008). *Baseline Assessment of Baby-Friendly Hospitals in Upper Egypt Governorates Prepared by the Egyptian Lactation Consultant Association (ELCA)*. In Consultation with MCH/MOHP-AUH, & UNICEF/ECO. Egyptian Lactation Consultant Association.
- Abul-Fadl, A. M., Al-Yassin, S. Z., Sarhan, A., & Al-Jawaldeh, A. (2019). Social Determinants That Influence Infant Feeding Practices. *MCFC Egyptian Journal of Breastfeeding*, 15, 105-132.
- Abul-Fadl, A. M., Shawky, M., El-Taweel, A., Cadwell, K., & Turner-Maffei, C. (2012). Evaluation of Mothers' Knowledge, Attitudes, and Practice towards the Ten Steps to Successful Breastfeeding in Egypt. *Breastfeeding Medicine*, 7, 173-178. <https://doi.org/10.1089/bfm.2011.0028>
- Ahmed, H. I. I. (2015). *Effect of Early Maternal Newborn Skin-to-Skin Contact after Cesarean Section on the Initiation and Continuation of Breastfeeding*. Master Thesis in Obstetrics and Gynecology Nursing, Faculty of Nursing, Alexandria University.
- Ahmed, H. M. (2013). *Barriers for Continuation of Breast Feeding among Primipara Mothers*. Master Thesis in Nursing Community, Faculty of Nursing, Ain Shams University.
- Ahmed, N. R. (2020). *Determinants of Exclusive Breastfeeding among Nursing Mothers and Adherence of Pediatricians towards Breastfeeding Guidelines*. Master Thesis in Family Medicine, Faculty of Medicine, Ain Shams University.
- Al-Ghwass, M. E., & Ahmed, D. (2011). Prevalence and Predictors of 6 Month Exclusive Breastfeeding in a Rural Area in Egypt. *Breastfeeding Medicine*, 6, 191-196. <https://doi.org/10.1089/bfm.2011.0035>
- Al-Jawaldeh, A., Abul-Fadl, A. M., Sayed, G. et al. (2019). Status of Breastfeeding Promotion in the Eastern Mediterranean Region. *MCFC Egyptian Journal of Breastfeeding*, 15, 133-150.
- Al-Jawaldeh, A., Abul-Fadl, A., & Farghaly, N. F. (2021). Enacting the Code by Effective National Laws Influence Trends in Exclusive Breastfeeding: An Analytical Study from the East Mediterranean Region. *Indian Journal of Child Health*, 8, 12-19. <https://doi.org/10.32677/IJCH.2021.v08.i01.003>

- Almaleh, R., Helmy, Y., Farhat, E., Hasan, H., & Abdelhafez, A. (2017). Assessment of Health Literacy among Outpatient Clinics Attendees at Ain Shams University Hospitals, Egypt: A Cross-Sectional Study. *Public Health, 151*, 137-145. <https://doi.org/10.1016/j.puhe.2017.06.024>
- Brimdyr, K., Widström, A. M., Cadwell, K., Svensson, K., & Turner-Maffei, C. (2012). A Realistic Evaluation of Two Training Programs on Implementing Skin-to-Skin as a Standard of Care. *The Journal of Perinatal Education, 21*, 49-157. <https://doi.org/10.1891/1058-1243.21.3.149>
- Dorri, R., Donnelly, T. T., McKiel, E., & Bouchel, S. R. (2021). Knowledge and Infant Feeding Practices' Influence on Arab Immigrant Mothers' Initiation and Exclusive Breastfeeding. *Middle East Journal of Nursing, 15*, 3-12. <https://doi.org/10.5742/MEJN2021.9378010>
- EDHS Ministry of Health and Population (Egypt), El-Zanaty and Associates (Egypt), and ICF International (2015). *Egypt Demographic and Health Survey 2014*. Ministry of Health and Population and ICF International.
- Elbadawy, S. E. A. (2020). *Effect of Early Initiation of Breastfeeding on Exclusive Breastfeeding at Eight Week*. Master Thesis in Pediatrics, Department of Pediatrics, Faculty of Medicine, Alexandria University.
- El-Deeb, S. (2009). *Assessment of Barriers to Early Skin to Skin Contact in Full Term Normal Vaginal Delivery versus Cesarean Section in Alexandria*. Master Thesis in Paediatrics, Faculty of Medicine, Benha University.
- El-Gilany, A., Abdel-Hady, D., & Abdel-Hady, D. (2022). Kaplan-Meier and Cox Regression Analyses of Exclusive Breastfeeding Discontinuation in Mansoura, Egypt. *The Egyptian Journal of Community Medicine, 40*, 12-18. <https://doi.org/10.21608/ejcm.2022.216339>
- El-Khalaf, M. M. (2021). *Myths and Facts of Mothers about Breast Feeding in Egypt: An Assessment Study*. Master Thesis in Pediatric Nursing, Department of Pediatric Nursing, Faculty of Nursing, Alexandria University.
- Ellakany, M. A. H. (2016). *Assessment of Breastfeeding Service in Family Centers in Alexandria*. Master Thesis in Public Health, Department of Tropical Health, High Institute of Public Health, Alexandria University.
- El-Samnie, M. A. (2012). *Assessing the Effectiveness of an Educational Intervention and Referral to Lactation Specialists for Relactation in Alexandria*. Master Thesis in Pediatrics, Pediatric Department, Faculty of Medicine, Benha University.
- Esmael, M. Y. (2015). *Factors Associated with Discontinuation of Exclusive Breastfeeding during the First Three Months Postnatal Months*. Master Thesis in Obstetrics and Gynecology Nursing, Faculty of Nursing, Alexandria University.
- Farag, R. M. (2020). *Prevalence of Breastfeeding and Factors Affect Its Practice in Women Attending Primary Health Care Units*. Master Thesis in Family Medicine, Department of Family Medicine, Faculty of Medicine, Ain Shams University.
- Gonaid, N. M. H. (2008). *Compliance of Mothers to the Breastfeeding Guidelines and the Attitude of Health Provider in Alexandria*. Master Thesis in Public Health, Department of Maternal and Child Health Tropical Health, High Institute of Public Health, Alexandria University. <https://doi.org/10.21608/jhiph.2008.22500>
- Hammouda, R. M. (2015). *Assessment of the Implementation of Ideal Breast Feeding Practices in El-Shatby Maternity Hospital in Alexandria*. Master Thesis in Pediatrics, Department of Pediatrics, Faculty of Medicine, Alexandria University.
- Harraz, M. M. H. (2020). *The Relation between Knowledge, Attitude and Practices of Mothers about Initiation and Exclusiveness of Breast Feeding and Infants' Nutritional*

- Status in Idku, Beheira*. Master Thesis in Family Medicine, Department of Community Medicine, Faculty of Medicine, Alexandria University.
- Khan, J., Vesel, L., Bahl, R., & Martines, J. C. (2015). Timing of Breastfeeding Initiation and Exclusivity of Breastfeeding during the First Month of Life: Effects on Neonatal Mortality and Morbidity A Systematic Review and Meta-Analysis. *Maternal and Child Health Journal*, 9, 468-479. <https://doi.org/10.1007/s10995-014-1526-8>
- Kim, S. K., Park, S., Oh, J., Kim, J., & Ahn, S. (2018). Interventions Promoting Exclusive Breastfeeding up to Six Months after Birth: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *International Journal of Nursing Studies*, 80, 94-105. <https://doi.org/10.1016/j.ijnurstu.2018.01.004>
- Kimani-Murage, E. W., Griffiths, P. L., Wekesah, F. M., Wanjohi, M., Muhia, N., Muriuki, P., Egondi, T. et al. (2017). Effectiveness of Home-Based Nutritional Counselling and Support on Exclusive Breastfeeding in Urban Poor Settings in Nairobi: A Cluster Randomized Controlled Trial. *Global Health*, 13, Article No. 90. <https://doi.org/10.1186/s12992-017-0314-9>
- Liu, C., Wang, D., Liu, C. et al. (2020). What Is the Meaning of Health Literacy? A Systematic Review and Qualitative Synthesis. *Family Medicine and Community Health*, 8, e000351. <https://doi.org/10.1136/fmch-2020-000351>
- Martens, P. J. (2012). What Do Kramer's Baby-Friendly Hospital Initiative PROBIT Studies Tell Us? A Review of a Decade of Research. *Journal of Human Lactation*, 28, 335-342. <https://doi.org/10.1177/0890334412438264>
- Metwally, S. (2018). *KAP of Working Mother towards Breastfeeding*. Master Thesis in Pediatrics, Pediatric Department, Faculty of Medicine, Benha University.
- Mohamed, R. I. I. (2016). *Maternal Practices in Care of Their Infants at El-Fayoum Governorate: An Assessment Study*. Master Thesis in Pediatric Nursing, Faculty of Nursing, Ain Shams University.
- Mostafa, H. (2022). *A Multicenter Study of the Knowledge, Attitude and Practice towards the Revised Ten Steps of the Baby-Friendly Hospital Initiative*. Master Thesis Protocol, Pediatric Department, Faculty of Medicine, Benha University, Egypt.
- Reifsnider, E., Gill, S., Villarreal, P., & Tinkle, M. B. (2003). Breastfeeding Attitudes of WIC Staff: A Descriptive Study. *The Journal of Perinatal Education*, 12, 7-15. <https://doi.org/10.1891/1058-1243.12.3.7>
- Said, M. M. (2020). *Feeding Practices during the First Six Months of Life*. MD Thesis in Family Medicine, Department of Family Medicine, Faculty of Medicine, Cairo University.
- Shaefer, H. L., Collyer, S., Duncan, G. et al. (2018). A Universal Child Allowance a Plan to Reduce Poverty and Income Instability among Children in the United States. *The Russell Sage Foundation Journal*, 4, 22-42. <https://doi.org/10.7758/rsf.2018.4.2.02>
- Shaikh, U., & Ahmed, O. (2006). Islam and Infant Feeding. *Breastfeeding Medicine*, 1, 164-167. <https://doi.org/10.1089/bfm.2006.1.164>
- Skafida, V. (2012). Juggling Work and Motherhood: The Impact of Employment and Maternity Leave on Breastfeeding Duration: A Survival Analysis on Growing up in Scotland Data. *Maternal and Child Health Journal*, 16, 519-527. <https://doi.org/10.1007/s10995-011-0743-7>
- Smith, E. R., Hurt, L., Chowdhury, R., Sinha, B., Fawzi, W., & Edmond, K. M. (2017). Delayed Breastfeeding Initiation and Infant Survival: A Systematic Review and Meta-Analysis. *PLOS ONE*, 12, e0180722. <https://doi.org/10.1371/journal.pone.0180722>
- Tavananezhad, N., Bolbanabad, A. M., Ghelichkhani, F. et al. (2022). The Relationship

- between Health Literacy and Empowerment in Pregnant Women: A Cross-Sectional Study. *BMC Pregnancy Childbirth*, 22, Article No. 351.
<https://doi.org/10.1186/s12884-022-04686-z>
- Tawfik, S., Saied, D., Mostafa, O., Salem, M., & Habib, E. (2019). Formula Feeding and Associated Factors among a Group of Egyptian Mothers. *Open Access Macedonian Journal of Medical Sciences*, 7, 1854-1859. <https://doi.org/10.3889/oamjms.2019.462>
- UNICEF (1991). *UNICEF/WHO Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding*. United Nations Children's Fund.
- UNICEF (2005). *UNICEF/WHO Innocenti Declaration on Infant and Young Child Feeding, 22 November 2005, Florence, Italy*. United Nations Children's Fund.
- USDA (2022). *WIC Breastfeeding Support*. U.S. Department of Agriculture.
<https://wicbreastfeeding.fns.usda.gov/whats-your-wic-food-package>
- Valero-Chillerón, M. J., Mena-Tudela, D., Cervera-Gasch, Á., González-Chordá, V. M., Soriano-Vidal, F. J., Quesada, J. A. et al. (2022). Influence of Health Literacy on Maintenance of Exclusive Breastfeeding at 6 Months Postpartum: A Multicentre Study. *International Journal of Environmental Research and Public Health*, 19, 5411.
<https://doi.org/10.3390/ijerph19095411>
- Victora, C. G., Bahl, R., Barros, A. J., França, G. V., Horton, S., Krasevec, J. et al. (2016). Breastfeeding in the 21st Century: Epidemiology, Mechanisms, and Lifelong Effect. *The Lancet*, 387, 475-490. [https://doi.org/10.1016/S0140-6736\(15\)01024-7](https://doi.org/10.1016/S0140-6736(15)01024-7)
- WHO (1981). *International Code of Marketing of Breast-Milk Substitutes*. World Health Organization.
- WHO (1989). *Protecting, Promoting and Supporting Breast-Feeding: The Special Role of Maternity Services. A Joint WHO/UNICEF Statement*. World Health Organization.
- WHO (2002). *Infant and Young Child Nutrition, Global Strategy on Infant and Young Child Feeding. World Health Assembly Resolution*. WHO.
- WHO (2017a). *The International Code of Marketing of Breast-Milk Substitutes—2017 Update: Frequently Asked Questions*. World Health Organization.
- WHO (2017b). *World Health Organization/UNICEF Guideline: Protecting, Promoting and Supporting Breastfeeding in Facilities Providing Maternity and Newborn Services*. World Health Organization.
- WHO (2018). *World Health Organization/UNICEF. Implementation Guidance: Protecting, Promoting and Supporting Breastfeeding in Facilities Providing Maternity and Newborn Services—The Revised Baby-Friendly Hospital Initiative*. World Health Organization.
- Zhang, Y., Yang, J., Li, W., Wang, N., Ye, Y., Yan, S., Wang, S., Zeng, T., Huang, Z., Zhang, F., Li, Y., Yao, S., Wang, H., Rozelle, S., Xu, T., & Jin, X. (2020). Effects of Baby-Friendly Practices on Breastfeeding Duration in China: A Case-Control Study. *International Breastfeeding Journal*, 15, Article No. 92.
<https://doi.org/10.1186/s13006-020-00334-4>