International Journal of Scientific Research and Management (IJSRM)
||Volume||07||Issue||04||Pages||MP-2019-139-148||2019||
Website: www.ijsrm.in ISSN (e): 2321-3418
Index Copernicus value (2016): 93.67, (2017):89.90, DOI: 10.18535/ijsrm/v7i4.mp01

Conflict, Nutritional Status and Patterns of Young Child Feeding: An in-depth analysis

Azza Abul-Fadl, Ayoub Al-Jawaldeh, Samaah Z. AlYassin

Professor of Pediatrics, Pediatric Department, Faculty of Medicine, Benha University, EGYPT
Department of Nutrition Sciences, University of Vienna, UZA Althantstrasse 14, 1090 Vienna, Austria
Clinical Nutritionist and Neonatologist 10 Abu Attahia street (Abbas Akad) Nasr City, Egypt

Abstract
Background: Malnutrition in countries of the Eastern Mediterranean region (EMR) impedes their development. **Aim:** To study patterns of complementary feeding (CF) and continued breastfeeding (CBF) on nutritional status and deaths from micronutrient deficiencies (MDs) in EMR countries. **Methods:** Data from 12 EMR countries were compiled using UNICEF Global expanded health survey (2018). Data included exclusive breastfeeding (EBF), and CBF rates. CF core indicators included introduction of soft and semi-solid and solid food (ISSS) at 6-8 months, minimum acceptable diet (MAD), minimum dietary diversity (MDD) and minimum meal frequency (MMF). Analysis was done in relation to age, sex, residence, wealth quintiles, maternal education, anemia, stunting and wasting in children under-five years of age (CU5) and deaths from MDs. **Results:** Less than one third in the region are EBF and less than one half continue to breastfeed into the second year. CBF was higher in the uneducated, poor and rural areas. Only one in 4 of children, below two years of age in the region, receive MAD, one third have MDD and two thirds MMF. MMF, MDD and MAD indices of CF increased significantly by education, increasing wealth quintiles and urban residence ($P<0.01$). Stunting correlated significantly with CBF (r0.76), MDD (r0.96) and MAD (r-0.96). Wasting correlated with CBF (r0.79), MAD (r-0.96) at $P<0.01$ and anemia in CU5 (r0.62) at $P<0.05$. MDs were significantly associated with CBF, stunting and wasting ($P<0.05$). **Conclusions**: Suboptimal CBF with inadequate diversity in food intake life cascade nutritional deficiencies and lead to malnutrition. This requires effective communication strategies and community based outreach nutrition programs.

Key words: Breastfeeding, complementary feeding, Eastern Mediterranean region, nutrition, nutritional deficiencies.

Background

Optimal nutritional status of children can be attained by optimal feeding practices that encourage early initiation and exclusive breastfeeding (EBF) in the first six months of life, with continued breastfeeding for two years or more. This safeguards the health and strengthens the immune system of the child which in turn prevents the vicious cycle of infections and malnutrition. Optimal complementary feeding (CF) practices are needed to support children to develop good future feeding and dietary practices once weaned off breastfeeding. The challenge the world is facing with development is that, in children under-five (CU5), over 155 million are stunted (22.9%) and 52 million are wasted (8%) [(1)]. Moreover increasing rates of obesity, beginning in childhood (6%) and climaxing among adults (12.8%), is the underlying cause for many preventable noncommunicable diseases particularly diabetes mellitus and cardiovascular diseases, which are the leading causes of morbidity and mortality globally.

Poor nutritional status continues to be a problem in CU5 in the Eastern Mediterranean region (EMR); with stunting representing 28%; wasting 8.7%; and anemia 18%. While 7.4% to 88% of pregnant women and 20 to 63% of women in the child bearing age have anemia. In addition, overweight and obesity are increasing in the EMR among school aged children (16.5% and 4.8% respectively) and in adults (27% and 24%

respectively) [2]. One third of the 30 countries with highest obesity rates come from this region. This multiple burden of malnutrition is not surprising since one half of the countries in the region suffer one form or another of conflict, hunger or chronic emergencies or are flooded by flights of immigrants from the neighboring countries in conflict, and thereby have to deal with their health and nutritional problems.

The Global strategy of infant and young children (IYCF) was endorsed by the 55th World Health Assembly in May 2002[3]. It calls for ensuring adequate and optimal infant feeding practices both by promoting and protecting breastfeeding and CF especially for infants living under challenging situations [3]. It reinforces the rights of the child to adequate nutrition, by supporting breastfeeding and access to safe and nutritious food in order to enable the child to achieve the highest attainable standard of health, as stated under the convention of the Rights of the Child (CRC) [4].

Review of different studies on the influence of commercially available foods on replacing, rather than complementing intake of breastmilk in children 6-23 months of age, suggest that intake of breastmilk is sensitive to energy density of complementary foods and to feeding frequency [5]. Moreover, studies emphasize how suboptimal breastfeeding and CF practices can interfere with optimum nutritional status, micronutrient status of these children and overall health and survival of CU5 [5]. Moreover, reliance on poor quality marketed foods decrease the adequacy of minimum diet diversity (MDD), frequency of feeding (MMF) and perpetuates nutritional deficiencies and violates the rights of children to optimum nutrition [4].

The World health organization (WHO) conducted several meetings to assess the importance of developing a guidance for countries on ending marketing of inappropriate foods and beverages for children under 36 months of age [7,8]. This resulted in the adoption of the 69th World Health Assembly meeting in May, 2016, to *End the promotion of foods for infants and young children* from birth to 36 months of age, thereby reinforcing the International Code of Marketing of Breastmilk Substitutes and expanding its scope from 6 months of age to 36 months of age [8].

Despite the adoption of worldwide initiatives to promote [3] and protect [4] breastfeeding, still children and mothers suffer from the negative effects of marketing [5,6]. Moreover, despite efforts to encourage optimal IYCF practices, there are increasing rates of malnutrition in many countries. Therefore the scope of this study is to analyze the current status of IYCF and identify factors associated with malnutrition in the EMR countries, particularly those engaged in different forms of conflict.

Methods

Source of data: Data were compiled from the expanded global UNICEF health survey (2018) derived from Demographic Health Surveys (DHS) and the UNICEF Multiple Indicator Cluster Surveys (MICS) for the years of 2006 for Syria, 2011 for Iraq and Tunisia, Jordan 2012, Pakistan and Yemen 2013, Afghanistan 2015 and 2014 for the remaining countries (Egypt, Oman, Sudan and State of Palestine) [7].

Selection of countries under study: The countries are categorized under EMR of the WHO. They included Afghanistan, Egypt, Jordan, Iraq, Oman, Pakistan, Somalia, State of Palestine, Sudan, Syria, Tunisia and Yemen. The selection was based on availability of partial or complete data about CF and breastfeeding. Most of the countries (80%) are being affected or recovering from exposure to ongoing conflict or chronic emergencies. Although Jordan and Oman are not countries under conflict they are still affected through immigrants and refugee camps, also countries as Tunisia and Egypt are recovering from conflicts and are struggling under economic pressures.

Data: The data represent the global United Nations (UN) core indicators for IYCF practices. Data included rates of EBF, CF and CBF which were available for one half of countries of the EMR. The CF indicators included the introduction of solid, semi-solid or soft foods (infants 6-8 months) (ISSS), minimum dietary diversity (MDD), minimum meal frequency (MMF), and minimum acceptable diet (MAD). They were analyzed for gender differences, residence (urban and rural), wealth quintiles (WQ1, WQ2, WQ3, WQ4, WQ5) using the World Bank classifications and equations for estimating wealth; and level of education (illiterate, primary, secondary and high) according to revised UNICEF global health survey and UNICEF multicenter indicator cluster surveys (MICS) and demographic health surveys (DHS) conducted in 2018 [7].

Data collected for nutritional status of CU5 included stunting, wasting, obesity and anemia using the global data of WHO health information systems. The data for deaths from nutritional deficiencies included: low mineral bone density (LMBD), vitamin A deficiency (VAD), zinc deficiency (ZnD) and iron deficiency anemia (IDA) expressed in percentages. These data were collected for estimated deaths from nutritional deficiencies from WHO Global Health Observatory (GHO) (https://www.who.int/healthinfo/global_burden_disease/estimates/en/index1.html) and Related links (WHO-MCEE methods and data sources for child causes of death 2000–2017; Global Health Observatory: causes of child mortality).

Definition of the core indicators used in the study:
EBF: Percent infants (0─5 months of age) who received only breast milk during the previous day from the total infants 0-5 months of age.
CBF: Percent children (20-23 months of age) who received breast milk during the previous day out of the total infants aged 20-23 months of age.
ISSS: Infants 6 to 8 months of age receiving solid, semi-solid and soft foods.
MDD: Percent children 6─23 months of age (breastfed and non-breastfed) who received foods from ≥ 4 food groups during the previous day out of the total children 6-23 months of age.
MMF: Percent Breastfed and non-breastfed children 6─23 months of age who received solid, semi-solid and soft foods the minimum number of times or more (by age) during the previous day out of the total breastfed and non-breastfed children 6─23 months of age.
MAD: Breastfed and non-breastfed children 6─23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day out of the total breastfed and non-breastfed children 6─23 months of age.
CBF at 12 months: children who were still breastfeeding at ages 12 to 15 months to total number of children aged 12 to 15 months of age.
CBF at 24 months: children who were still breastfeeding at ages 20 to 23 months to total number of children aged 20 to 23 months of age.

Other core indicators for CF as the consumption of iron-rich or iron-fortified foods were not included as they were not available from the data source that was used. However we included prevalence rates of anemia in CU5.

Data Analysis: The collected data were organized, tabulated and statistically analyzed first on excel sheets for initial analysis. The relevant data were further analyzed using a software statistical package (SPSS version 20, SPSS Inc; Chicago, Illinois). Student t-test (for parametric data) and Mann-Whitney U test (for non-parametric data) were used for comparison of 2 distinct groups. Correlative studies were done using paired bivariate Spearmann's correlation coefficient. The cut off level of significance was $P<0.05$.

Ethical considerations: The source of data permits open access online for national and global use and no permission is required to re-analyze.

Results

The mean EBF rate was 30.6±13.1 being highest in Sudan (54.6) and lowest in Tunisia (8.5). ISSS **is 72.1±13.5** being highest in Palestine (89.6) and lowest in Afghanistan (61). Mean MAD rate was 24.3±9.6 being highest in State of Palestine (39.0) and lowest in Somalia, Yemen and Afghanistan (9, 15.4, 15.5 respectively). Mean MDD rate was 33.6±15.4 ranging from 67.2 in Oman to 21.**3** in Yemen. Mean MMF was 61.7±12.5 ranging from 78.8 in State of Palestine to 42.1 in Sudan. Mean continuity of breastfeeding (12 to 23 months) was 45.6±17.9 ranging from a high of 59.1 in Tunisia to a low of 12.9 in Jordan. (Table 1 and figure 1).

Table (1) Status of breastfeeding and complementary feeding in the countries under study

Country	**EBF**	***ISSS (6-8mo)**	**MAD**	**MDD**	**MMF**	**CB12-23**
Afghanistan	43.1	61.0	15.5	22.1	51.2	58.6
Egypt	39.5	75.2	23.3	34.7	60.2	20.4
Jordan	22.7	85.1	33.3	38.8	80.9	12.9
Iraq	19.4	70.0	34	44.6	76	57.3

Oman	32.8	NA	29.1	67.2	50.6	48.5
Pakistan	37.7	66.3	14.8	17.8	62.7	56.1
State of Palestine	38.1	89.6	39.0	50.3	78.8	59.3
Somalia	33	81	9	15	69	15
Sudan	54.6	61.2	29.1	24.0	42.1	48.8
Syria	28.5	43.8	NA	NA	NA	66.2
Tunisia	8.5	83.8	NA	NA	48.2	59.1
Yemen	9.7	69.2	15.4	21.3	58.5	45.3
Mean	**30.6**	**72.1**	**24.3**	**33.6**	**61.7**	**45.6**
SD	**±13.1**	**±13.5**	**±9.6**	**±15.9**	**±12.5**	**±17.9**

EBF: Exclusive breastfeeding, ISSS: Introduction of solid, semi-solid and soft foods (6-8 months), MAD: Minimum acceptable diet, MDD: Minimum diet diversity, MMF: minimum meal frequency.

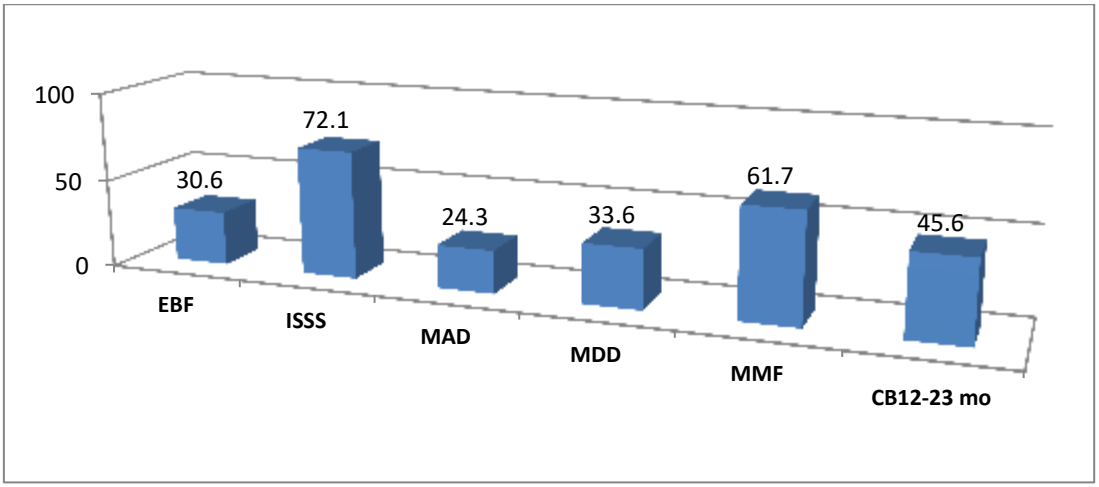

Figure (1) Demonstration of mean rates of breastfeeding and complementary feeding in the countries under study. EBF: Exclusive breastfeeding, MAD: Minimum acceptable diet, MDD: Minimum diet diversity, MMF: Minimum meal frequency.

Table (2) presents the mean and standard deviation core indicators for breastfeeding and complementary feeding in relation to sex, residence, WQs (1-5) and maternal education. There were no apparent differences in relation to sex with regards EBF, MDD, MMF and MAD, but CBF tended to be lower for females than for males**.** Core indicators for complementary feeding tended to be higher in urban than in rural areas and increased with increased level of education and WQs. On the other hand EBF and CBF tended to be higher in rural than in urban settings and decreased with increased level of education and increasing WQs. MAD, MMF and MDD showed significant differences between WQ1 and WQ5, (P=0.002), WQ3 and WQ4 (p= 0.008) respectively) and primary and secondary higher of education (P=0.008 and P=0.03). EBF and CBF showed significant differences between urban and rural (p= 0.004 and p=0.02) and CBF between either sex (p= 0.01) respectively. However CF indicators did not differ by sex or residence.

Table (2) Mean and standard deviation for the early feeding practices in relation to sex, residence, maternal education and wealth quintiles

Social determinant	**EBF**	**ISSS (6-8mo)**	**MAD**	**MDD**	**MMF**	**CBF 12-23 mo**
Sex (mean±SD)						
Males	30.1±15.62	71.3±13.2	23.7± 10.25	29.8± 11.48	59.4± 12.39	51.0±* 16.5
Females	30.7± 14.46	72.0± 13.7	23.4± 8.8	30.0± 10.43	59.9± 11.99	46.2± 18.0*
Residence (mean±SD)						
Urban	28.6± 14.19*	74.8± 13.6	27.3± 6.43	35.6± 7.01	62.2± 12.69	45.6±* 18.0
Rural	31.9± 15.18*	70.9± 14.6	21.7± 10.54	28.6± 15.36	59.4± 13.016	51.2±* 17.4
Maternal level of education (mean±SD)						
No education	36.0± 12.57	53.8± 12.59	NA	NA	NA	54.8± 19.1
Primary	33.0± 14.17	73.6± 15.75	NA	NA	NA	53.7± 16.2

No or primary	NA	67.8± 16.05	25.6± 6.08*	28.0± 17.47*	51.2± 12.84*	53.5± 14.8
Secondary	34.5± 15.94	74.0± 14.1	16.2±10.69*	33.1± 6.29	55.1± 10.09	46.4± 19.7
High	30.5± 14.51	82.0± 14.24	30.9± 10.4*	42.0± 4.55*	62.3± 12.25*	42.0± 19.3
Secondary or high	NA	75.9± 12.9	NA	35.5± 5.50	NA	45.7±17.4
	Wealth Quintiles (WQ)					
WQ1	30.8± 14.13	65.7± 17.6	17.4± 7.91*	24.7± 16.75*	54.0± 15.05*	55.9± 19.3
WQ2	31.8± 14.74	68.9± 16.39	20.3± 9.35	24.9± 10.32	56.4± 12.40	51.2± 17.3
WQ3	30.1± 16.64	71.3± 14.14	22.2± 10.03	27.4± 10.97*	59.5± 12.76*	49.2± 18.4
WQ4	30.0± 15.25	76.2± 11.8	27.2± 12.55	32.8± 11.41*	63.4± 11.85*	47.4± 17.3
WQ5	29.0± 16.0	76.7± 16.72	34.1± 12.03*	42.8± 10.31*	67.4± 13.05*	43.3± 18.4

EBF: exclusive breastfeeding, MAD: minimum acceptable diet, MDD: Minimum diet diversity, MMF: minimum meal frequency, WQ: wealth quintiles. * p-value less than 0.05.

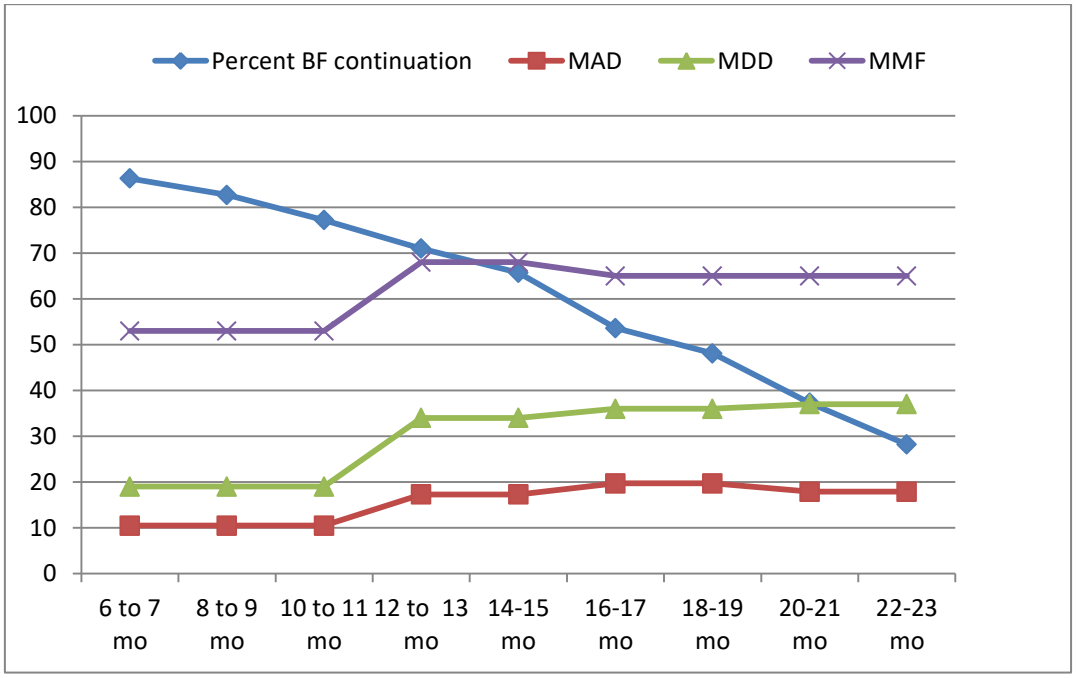

Figure (2) Trends in breastfeeding continuity and indicators of complementary feeding over the age groups of 6 to 23 months.

Table (3a and 3b) and figure (2) present age related trends for breastfeeding and complementary feeding after 6 months of age. Increase in MMF, MDD and MAD occurred at around 12 to 13 months while sudden drop in CBF was steeper in the second year particularly at 18 months of age.

Figure (3) demonstrates the prevalence rates of LBW per 1000 live births, and anemia in CU5 in the countries under study. The mean and standard deviation for LBW was 18.4±11.95 ranging from (39.9%) in Yemen to (6.3%) in Iraq. Mean anemia in CU5 was 45.2±18.74 ranging from 61.0% in Afghanistan to 21.7% in Tunisia. Nutritional anemia in the pregnant woman (NAP) was 43.18±11.01 ranging from 84.6% in Sudan to 27% in the State of Palestine.

Figure (4) presents the relationship between NAP and LBW with stunting, wasting and anemia CU5 in the countries under study. Significant correlations were present between LBW and stunting, wasting and anemia in CU5 (0.69, 0.81, -0.74 at p= 0.02, p=0.003, p=0.009 respectively). There were no significant relationships between NAP and LBW, stunting, wasting and anemia in CU5 (0.57, 0.34, 0.22, -.55 respectively) at p>0.05.

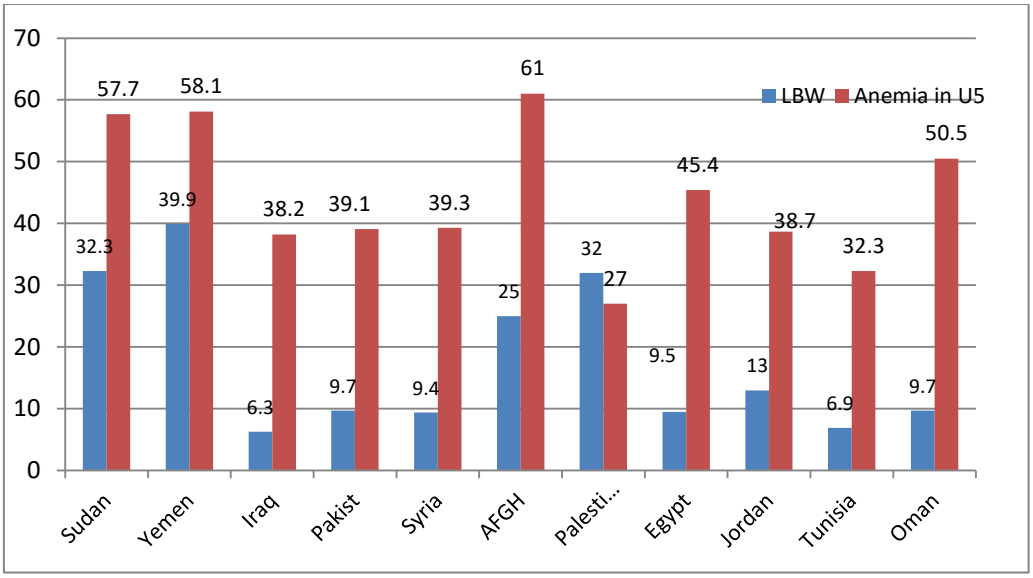

Figure (3) Prevalence of low birth weight (LBW), anemia in the under-five of age (CU5), and low birth weight in the countries under study.

Table (4) presents correlative studies between core indicators of breastfeeding and complementary feeding practices with the nutritional status and deaths from nutritional deficiencies in CU5 in the countries under study. Significant correlations were evidenced between stunting with CBF (r0.76), MDD (r0.96), MAD (r-0.96), wasting with CBF (r0.79), MAD (r-0.96) at P<0.01, anemia in CU5 (r0.62). Deaths from LBMD, ZnD and IDA (r0.66, r0.65, r0.87 respectively) were significantly associated with CBF (P<0.05). There were also significant associations between the various ND, so that LBMD correlated significantly with ZnD, VAD and IDA (r0.83, r0.68, r0.90 respectively at P<0.001). Also VAD correlated significantly with ZnD and IDA (r0.75, r0.703 respectively at P<0.01), and IDA correlated significantly with LBMD, ZnD, VAD (r0.904, r0.890, r0.703 respectively) at P<0.01.

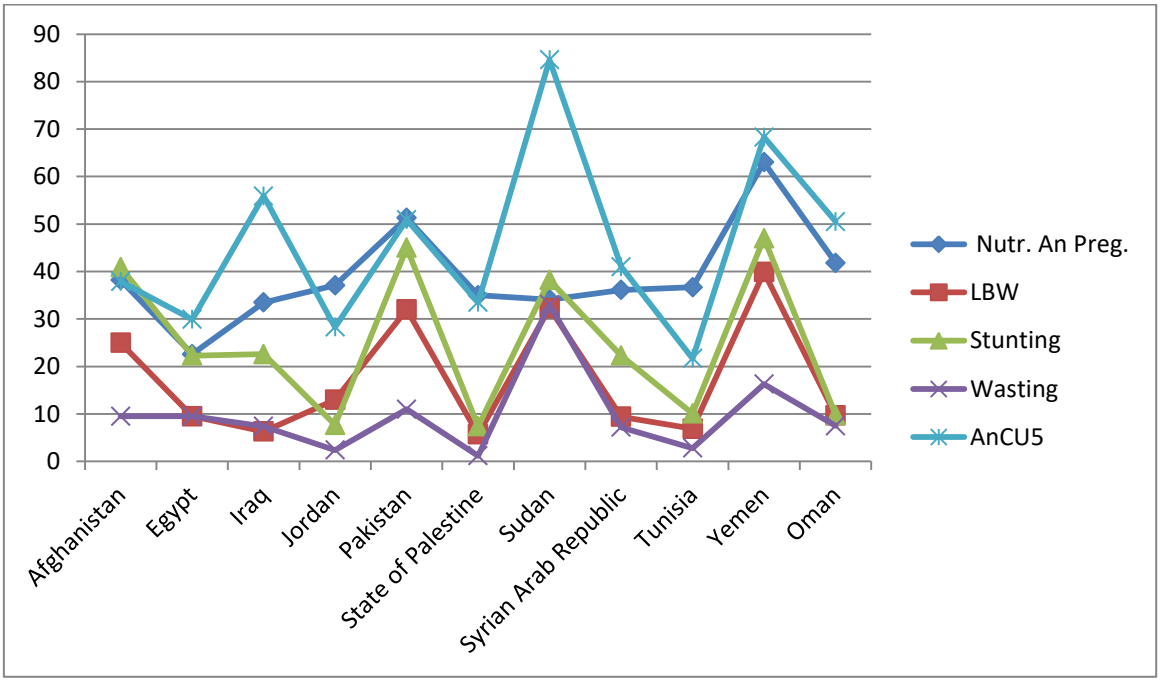

Figure (4) Correlative studies between nutritional anemia in pregnant, low birth weight and stunting, waasting and anemia under five years of age in the countries under study.

Table (4) Correlations between core indicators of breastfeeding and complementary feeding practices with nutritional status and deaths from nutritional deficiencies in under five yeats of age in the countries under study

	EBF	CBF	ISSS	MAD	MMF	MDD
Nutritional Status						

Stunting	r0.10	r0.76**	r-0.34	r-0.96**	r-.25	r-0.96**
Wasting	r0.33	r0.79**	r-0.37	r-0.96**	r-.40	r-0.72
Anemia in under 5 of age	r0.21	r0.62*	r-0.36	r0.71	r -0.31	r-0.64
Overweight	r-0.12	r-0.37	r-.014	r-0.16	r0.12	r-0.36
Obesity in under 5 of age	r0.13	r0.11	r-0.25	r-0.631	r-0.08	r-.519
Deaths from nutritional deficiencies						
LMBD	r0.394	r0.66*	r-0.21	r0.70	r-0.36	r0.60
ZnD	r0.455	r0.65*	r-0.12	r0.60	r-0.57	r0.60
VAD	r0.693*	r0.55	r-0.17	r0.70	r-0.61	r0.66
IDA	r0.426	r0.87**	r-0.38	r0.60	r-0.54	r0.47

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).
EBF: exclusive breastfeeding, MAD: minimum acceptable diet, MDD: minimum diet diversity, MMF: minimum meal frequency, WQ: wealth quintiles, LMBD: low mineral bone density, ZnD: Zinc deficiency, VAD: vitamin A deficiency, IDA: iron deficiency anemia.

Discussion

Our study showed that the region is suffering from challenging feeding practices that are the underlying cause for many of the malnutrition and nutritional deficiency problems in the region. Less than one third of children below six months of age in the region are EBF and less than one half continue to breastfeed into the second year. CBF was higher in the uneducated, poor and rural areas. Only one in 4 of children, below two years of age, in the region, receive MAD, one third have MDD and two thirds MMF. Overall the indicators for MAD, MDD and MMF were lower than the global optimum requirements for adequate nutrition. They were lower in rural areas and children from low wealth quintiles and highest wealth quintile groups in the countries of the region but did not differ by sex but increased.

These countries are characterized by being exposed to political instability, chronic emergencies and conflict. Under such conditions women and children suffer most and are at risk of deprivation from the essential food elements essential for optimal health and growth [(8)]. In Yemen, conflict and poverty have caused the health system to break, leaving children to suffer from food insecurity and disease [(9)]. Armed conflict is more likely to occur in weak countries with weak states, with poor access to water and land leading to loss of farms, food supply and access to health care [(10)]. There is enough evidence to support the negative effect of conflicts [(12)]. Also communities living close to regions with conflict may be adversely affected by the flow of immigrants. However, there is not enough evidence to support strategies for governments to prevent and deal with the effects of conflicts on health care systems, to improve quality and access to health care for preventing the short and long term effects of malnutrition associated with such conflicts [(11)].

Tunisia and State of Palestine are remarkable examples of how countries are able to cope, recover and strengthen their primary health care services even after the effects of conflict as evidenced by the lower rates of LBW and anemia [(12)]. While in Egypt and Sudan the poor resources of qualified staff, population growth and female illiteracy have presented barriers to the recovery of the health and nutrition related indicators as evidenced by the high prevalence rates of anemia in pregnant women and CU5[(13, 14)]. Ongoing conflicts in Yemen and Syria are having deleterious effects on multiple indicators [(9)].

Moreover, countries in conflict are exposed to the greedy marketing practices of infant and young children commercial products that utilize food subsidies in emergencies to flood the country with their products and benefit from the subsidization guaranteed by countries or donor agencies [(5, 15, 16)]. The Egypt case study in 2016 is a typical example, whereby the companies where provided by millions of foreign currency to provide freely accessible low cost infant milk formula to babies under cover of the faked shortage of these products for children [(17)]. Stronger global legislations are needed to protect these vulnerable communities, especially those with weak governments due to ongoing conflicts, from the adverse effects of marketing and unnecessary donations [(3,4,16)].

Our study showed that maternal illiteracy, low income status and rural residence are associated with lower MAD, MDD and MMF. However they were also associated with longer duration of breastfeeding. The latter is expected since CBF is higher among the poor and uneducated or those living in chronic emergencies and states of economic and political instability, as shown from the experiences of countries as Afghanistan and Iraq in the EMR [(10)] and Ethiopia, Nigeria and Côte d'Ivoire in Africa [(11, 12, 13)].

In our study core indicators were low for CF especially for food diversity (MDD) and were associated with CBF. In Egypt, the demographic health survey in 2014 [13] showed that there was an evident difference in the quality and diversity of foods offered to breastfed and non-breastfed children aged from 6 to 23 months. Only 24.8% of breastfed children vs. 41.5% receive fruits or vegetables rich in vitamin A, 28.3% of breastfed receive meats, poultry or fish compared to 48.7% of the non-breastfed and 36.9% receive any fruits and vegetables vs. 55.3% in non-breastfed. This shows that the quality of foods offered to the breastfed children is lower than that of who are not breastfed [13]. A study in Nigeria reported low MDD and MAD (16%) by 6-9 months and one half after this age [18]. Also that bottle-feeding was practiced in 11%, but feeding by cup, plate and spoon was 84% and 3.3% by hand feeding [18]. Although breastfeeding remains the safest and most nutritious food to support children living in difficult circumstances, yet many misconceptions prevail about the feeding practices during the second year that interfere with the adequacy of CBF. For instance, many mothers substitute a meal for breastfeeding, when they should be breastfeeding in-between main meals. Mothers tend to offer soft, ready-made foods that do not allow the child to learn to chew foods and lack fiber, which is important for digestion, absorption, uptake and utilization of nutrients. Also, mothers tend to practice force feeding rather than responsive feeding and discourage self-feeding, this makes the meal a traumatic experience for the child. Finally, children in the second year are offered marketed snacks rich in sugars and salt which are unsuitable for children in their age. In the Nigeria study, responsive feeding was practiced by two thirds, but two thirds also added salt to meals of their children. Poor CF practices were linked with poor income and illiteracy [17]. In Pakistan, knowledge about age of weaning off breast was high yet attitude and practices of mothers were markedly low with regards CF (24%) [19]. Also a study in Sudan showed poor CF practices and hand feeding was more common than spoon feeding [14].

Nutritional deficiencies were associated with low MDD and MAD. Our study showed that mothers in poor rural areas, who were illiterate or with low education, had inadequate CF indicators, which substantiates the previous studies in Egypt [13], Sudan [14], Pakistan [19] and Nigeria [18]. Moreover, CBF was accompanied by inadequate food diversity, meal frequency and with stunting, wasting and nutritional deficiencies mostly vitamin A, D, iron and Zinc deficiencies. CBF was also common among the poor and illiterate mothers. This is because CBF is common among communities who are poor, illiterate and do not have the knowledge and resources to provide their children with adequate nutrition.

The high rates of anemia in pregnant women can explain the high rates of LBW. Meta-analysis studies have shown that maternal nutritional anemia in pregnant women is associated with increased risk of intrauterine growth retardation, preterm birth and LBW [20]. While the high rates of LBW together with the poor CF practices can explain even the higher anemia rates in CU5. Malnutrition and lack of access to diversity of foods in countries in conflict, particularly foods rich in iron, can explain the high rates of anemia both among pregnant women and CU5 [21]. The challenge to overcome the high prevalence of anemia in countries in chronic states of conflict is difficult as shown in countries like Afghanistan and Iraq [21, 22]. However lessons learnt from other countries that ensured availability of local, low priced foods rich in iron has been shown to minimize the effects of iron deficiency anemia and improve outcomes in such children [23].

Our study showed that rates of stunting and wasting were closely associated with decreased MDD and MAD. Multiple nutritional deficiencies (MND) are also common in children with stunting and wasting. MND coexist with one another so that deficiency of one can lead to deficiency of another as shown by the associations between IDA, VAD, ZnD and vitamin D deficiency [24, 25,26]. Hence improving one nutritional deficiency can improve the status of another and prevent the cascading effect of MND on health and survival. With extreme poverty and chronic emergencies, the only nutrition for young children becomes breastmilk which can explain our findings of the associations found of MND with CBF. In our study women in rural areas and in lower quintiles of wealth were more likely to have lower MDD, MAD, as well as poor CF indices, although having higher rates of CBF.

Conclusions

As a consequence of suboptimal IYCF, countries in chronic conflicts are at risk of a negative secular trend in their growth and development, thus increasing the burden of disease and economic demise in the region and the world at large. Efforts to prevent this should focus on improving breastfeeding and CF practices by

revisiting our current guidelines and recommendations for infant feeding in the second year of life. Social indicators and primordial prevention should take priority including poverty, illiteracy and women empowerment. LBW, associated with nutritional anemia in the pregnant women, continues to challenge nutritional status and MDs in young children. Encouraging food diversity and optimizing breastfeeding practices are key factors that can reverse trends in the nutritional status of women, infants and young children.

Recommendations

We recommend that women in emergencies should receive supplemental vitamins and iron for both mother and child without abating CBF and should be guided on feeding their children locally available high quality foods. Guidelines for nutritional support must include CBF and nutritional supplements and support increasing the adequacy of milk intake, diverse food intake at a high frequency, while encouraging continued breastfeeding to increase uptake and utilization of foods. CBF is an appetizer before meals and as a means for enhancing digestion and absorption after meals, provides protection, by its rich immune properties, and meets the socio-psychological needs of children for optimal growth and development. This requires well-structured community outreach programs, coordination and integration between programs and communication strategies for strengthening breastfeeding promotion in countries in conflict [(27)].

References

[1] FAO, IFAD, UNICEF, WFP and WHO. The state of Food Security and Nutrition in the World 2017. Building resilience for peace and food security. Rome, FOA. 2017.

[2] Nasreddine L, Ayoub JJ, AL-Jawaldeh A. Review of the nutrition situation in the Eastern Mediterranean Region. Eastern Mediterranean Health Journal. 2018; 24(1):77-91.

[3] World Health organization, UNICEF. Global Strategy for Infant and Young Child Feeding (endorsed by the 55th World Health Assembly meeting in its resolution WHA 55/.25 of May 2002). WHO, Geneva, Switzerland, 2002.

[4] UNICEF. Convention of the Rights of the Child. UNICEF, New York, USA, 1989.

[5] World Health Organization. Scientific and technical advisory group (STAG) on inappropriate promotion of foods for infants and young children, 24-25 June, 2013 Geneva, Switzerland. ISBN: 978 92 4 150662 5.

[6] Kazi TG, Jalbani N, Jameel A, Baig MB, Arian H, Afridi HI. Evaluation of toxic elements in baby foods commercially available in Pakistan. Food chemistry. 2010; 119(4):1313-1317.

[7] United Nation's Children Fund division of Data Research and Policy. UNICEF Global database on Infant and Young Child Feeding. Expanded health survey. UNICEF, New York, May, 2018.

[8] Howell E, Waidmann T, Holla N, Birdsall, N, Jiang K.The impact of civil conflict on child malnutrition and mortality, Nigeria, 2002-2013 – CDG Working paper 494 Center for global Development, 2018. https://cgdev.org>default>files.

[9] Madhok R, AlSharafi E. In Yemen conflict and poverty exacerbate child malnutrition. UNICEF, New York, 2017.

[10] Dabalen AL, Paul S. Effect of conflict on dietary diversity: Evidence from Cote d'Ivoire. World Development. 2014; 58(C):143-158.

[11] Delbiso T, Rodriguez-LIanes JM, Donneau AF, Speybroeck N, Guha-Sapir, D. Drought, conflict and children's undernutrition in Ethiopia 2000-2013: a meta-analysis. Bulletin of the World Health Organization. 2017; 95 (2):94-102.

[12] Kruk ME, Freedman, LP, Anglin GA. Waldman RJ. Rebuilding health systems to improve health and promote state building in post conflict countries: A theoretical framework and research agenda. Social Science & Medicine. 2010; 70(1):89-97.

[13] Egypt Demographic Health Survey 2014. Ministry of Health and Population, National population council, Arab Republic of Egypt, Cairo, Egypt, 2014.

[14] Mohamed SGS. Infant feeding and weaning practices in Northern Kordofan state, Sudan. European Scientific Journal. 2014; 10(24):165-181.

[15] World Health Organization. Draft clarification of and guidance on inappropriate promotion of foods for infants and young children, 9-10 June, 2015 Geneva, Switzerland.

[16] World Health Assembly. Resolution WHA69.9 Ending inappropriate promotion of foods for infants and young children, 69th WHA meeting, 28th May, 2016, World Health Organization, Geneva, Switzerland.

[17] Kent G, Sayed G, Abul-Fadl A. Government provision of Infant Milk Formula in Egypt. Social Medicine. 2017; 11:1-7.

[18] Olatona FA, Adenihun JO, Aderibigbe SA, Adeniyi OF. Complementary feeding knowledge, practices and dietary diversity among mothers of under-five children in an urban community in Lagos State, Nigeria. International J MCH and AIDS. 2017; 6(1):46-59.
[19] Mohsin SS, Shaikh AS, Shaikh R, Haider N, Parkash A. Knowledge, attitude and practice of mothers regarding complementary feeding. J Dow University Health Sciences. 2014; 8(1):21-25.
[20] Figueiredo ACMG, Gomes-Filho IS, Silva RB, Pereira PPS, Mata FAFD, Lyrio AO, Souza ES, Cruz SS, Pereira MG. Maternal anemia and low birth weight: A systemic review and meta-analysis. Nutrients. 2018; 10(5): Pii:E601.
[21] Mashal T, Takano T, Nakamura K, Kizuki M, Hemat S, Watanabe M, Seine K. Factors associated with the health and nutritional status of children under five of age in Afghanistan: family behavior related to women and past experience hardships. BMC Public Health. 2008; 8(1):301.
[22] Serdan CG. The effects of the war in Iraq on nutrition and health. An analysis using anthropometric outcomes for children. 2009 (http://mpra.ub.uni-muechen.de/14056/1/ Effects of the war in Iraq on Nutrition Revised Tables Deb 2009.pdf.)
[23] Young H, Borrel A, Holland D, Salama, P. Public nutrition in complex emergencies. The Lancet. 2004; 364 (9448):1899-909.
[24] Bloom MW. Interdependence of vitamin A and iron: An important association for programmes of anemia control. Proc. Nutr. Soc. 1995; (54):501-508.
[25] Kelkitli E, Ozturk, N, Aslan NA, Kilic-Baygutalp N, Bayraktutan Z, Kurt N, Bakan N, Bakan E. Serum zinc levels in patients with iron deficiency anemia and its association with symptoms of iron deficiency anemia. Ann Hematol. 2016; 95(5):751-6.
[26] Azizi-Soleiman F, Vafa M, Abiri B, Safavi M. Effects of iron on vitamin D metabolism: A systematic review. Int J Prev Med. 2016; 7:126.
[27] Al-Jawaldeh A, Abul-Fadl A, Sayed G. Communication Strategies for Strengthening Breastfeeding Promotion in Countries in Conflict. International Journal of Humanities and Social Science. 2018; 6(11):233-240.