Influence of 1991-1995 War on Breast-feeding in Croatia: Questionnaire Study

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Aim. To investigate the influence of 1991-1995 war on the prevalence, duration, and practice of breast-feeding Croatian children up to 5 years of age.

Method. In 1996, interviews were conducted in households with children up to 2 years of age (757 children) and 2-5 years of age (1,180 children). Data for war-free areas, war-affected areas, and areas liberated after several years of occupation were analyzed separately.

Results. In 1996, 94.6% of mothers started breast-feeding, which lasted for an average of 3.4±2.9 months. The proportion of mothers who started breast-feeding did not vary with respect to either war-related or geographic areas of the country. Breast-feeding was significantly longer in war-free than in war-affected areas (3.7±3.1 vs. 2.7±2.1 months, respectively; p=0.015). The duration of breast-feeding in Croatia’s geographic regions, Istria, Hrvatsko Primorje, and Gorski Kotar, was significantly longer than in Slavonia (3.9±3.4 vs. 3.4±3.0, respectively; p=0.037). On the country level, 49.4% of babies were fed on demand and 43.3% according to a daily schedule. The percent of children who were not breast-fed was significantly higher (p=0.002) in the older age group (2-5 years of age, 9.3%) than in the younger age group (up to 2 years of age, 5.4%).

Conclusions. The war decreased the prevalence and duration of breast-feeding, which might be related to regular humanitarian donations of infant food and mother’s milk substitutes, especially in the war-affected areas. UNICEF breast-feeding campaign, which started in 1993, appeared to be effective.

Key words: breast-feeding, child nutrition; Croatia; food supply; health education; humanitarianism; infant nutrition; milk, human; war

Even before the 1991-1995 war (1), the number of breast-fed babies in Croatia was very low (2). Over the past twenty years, breast-feeding was more common in the rural than in the urban population, but more recent research showed that the rate of breast-feeding in both groups has leveled out (3). This means that nowadays only about 75% of mothers breast-feed their babies when they leave the maternity hospital, and no more than 30% continue to do so up to the end of baby’s third month of life (4).

With the development of the baby food industry in the last decades, especially mother’s milk substitutes, a decrease in the number of breast-fed babies has been noticed throughout the world (4,5). Subtle advertising and sales methods used for mother’s milk substitutes (6-9) have suppressed breast-feeding, which is the best form of infant nutrition. This has resulted in a small rise in the infant morbidity rate from various diseases, which caused great concern to the pediatricians (10).

Following United Nations Children’s Fund (UNICEF) suggestions, many countries in the world have started a campaign to promote breast-feeding (11-15). Breast-feeding promotion program has been received best in regions with a better social and economic status (4,5). UNICEF and the World Health Organization (WHO) have defined their own strategy to promote breast-feeding as “Ten Steps to Successful Breast-feeding” (15). The breast-feeding promotion strategy includes all levels of society (16), individuals as well as communities, but aims primarily at maternity hospitals, where mothers make the first contact with their babies. The success and length of breast-feeding depends on the quality of this encounter (17). Maternity wards that successfully apply the strategy for the promotion of breast-feeding, as assessed by a national assessment team, receive the “Baby-Friendly Hospital” title (15,18). During the breast-feeding promotion campaign in Croatia (1993-1998), 15 of the total of 32 maternity
wards received this title, and all others made significant improvement (19).

UNICEF came to Croatia in 1991, and started the breast-feeding promotion campaign in 1993 (10). The aims of the campaign were education of health workers in primary health care and maternity wards, preparation of educational literature, and drawing public attention to the issue of breast-feeding. A special place in the campaign was given to the “Baby-Friendly Hospital” initiative, because the recommendations defined in the “Ten Steps to Successful Breast-feeding” had not been observed in Croatian maternity wards. The babies were separated from their mothers (except in some small hospitals), breast-feeding on demand was not practiced, and milk formulas were used widely. However, it is also possible that a subtle reason for taking babies off mother’s milk during the war in Croatia could be war-related humanitarian aid, which regularly included supplies of milk formulas, bottles, and teats (20-24). Humanitarian organizations have defined regulations and methods for the distribution of milk formulas and for mother’s milk substitutes, always emphasizing the advantages of mother’s milk (22-24), but in reality poorly keeping up to the recommendations. The Innocenti Declaration, which regulates the manner of sale, advertisement, and distribution of mother’s milk substitutes, also applies to all humanitarian baby food donations (23), but the decrease of breast-feeding in war-affected areas of Croatia, as documented in this study, opens the possibility that adverse influences have been stronger.

The aims of our study were to determine the prevalence and duration of breast-feeding children up to 2 years of age in areas differently affected by the 1991-1995 war in the country (1); to determine the prevalence of breast-feeding on demand and on schedule; and to assess whether the breast-feeding campaign, initiated by UNICEF in 1993, had noticeable effects three years later.

Subjects and Methods
During 1996, the Children Hospital Zagreb and UNICEF Office for Croatia conducted a specially structured epidemiological study of parental knowledge and behavior concerning children’s health and nutrition in the Republic of Croatia.

Sample Selection
Bearing in mind the differences in the density of population and in the intensity of war activities in different regions of the country, a specific method was used to select samples. In this way we ensured the research to be as representative as possible and the stratification procedures applied properly.

The target population was defined as “households with children under the age of 5”. A household was operationally defined as a group of persons who live and eat together. A stratified random sample of clusters was used. A “cluster” was a randomly selected population group of 40 households with children under the age of 5. The cluster sampling was a two-stage process. Firstly, we divided the Republic of Croatia into three areas (strata) depending on the intensity of war activities (Fig. 1): (a) war-free areas, which were not significantly affected by the war activities or were liberated before 1995 – these included the city of Zagreb, Northern Croatia, Istria, Hrvatsko Primorje, and Gorski Kotar; (b) war-affected areas, in which the most intensive war activities occurred before 1995, but after the fighting remained under the control of Croatian Government; and (c) “liberated areas” – areas occupied in 1991 and reintegrated into the Republic of Croatia during the 1995 “Lightning” and “Storm” military campaigns (1). In 1996, the eastern part of the country (UNPA East, Fig. 1) was still occupied and thus was not included in this study.

The traditional division of the Republic of Croatia into six regions (Northern Croatia; Slavonia; Lika and Banovina; Istria, Hrvatsko Primorje and Gorski Kotar; Dalmatia; Fig. 1) was also used in the analysis of data.

The second step in the sample definition was identification of households to conduct the interview. The Republic of Croatia was first divided into 7,832 segments of 120-150 households. Among them, 370 segments were selected by probability proportional to size (size was defined as number of households per segment). Then, the households were systematically selected, so that a cluster of 40 households from each segment was included in the sample. This resulted in 14,800 households selected for the final stage. Among them, 1,937 (10.6%) were those with children under the age of 5 (a total of 1,937 children). (PULS, Zagreb) and 87 field workers were engaged. They were all university students from different parts of Croatia.

The fieldwork was done by a professional agency (PULS, Zagreb) and 87 field workers were engaged. They were all university students from different parts of Croatia. Before the survey, they all attended a training course on their future work, and with the questionnaire received extensive

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Figure 1. Map of Croatia. Yugoslav Federal Army and Serbian paramilitary forces have occupied the four zones (United Nations Protected Areas, UNPA South, North, East, and West) in 1991 after heavy fighting. In 1995, Croatian Police and Army liberated zones West (May), South and North (August), whereas UNPA East was peacefully reintegrated in January 1998. In this text these areas are designated “liberated”. Areas neighboring the 4 UNPA zones, and parts of Dalmatia around cities of Dubrovnik, Zadar and Šibenik, which after 1991-1992 fighting remained under control of Croatian Government, are considered war-affected zones. The remaining parts of the country have not been directly affected by war, and are designated as war-free. Croatian provinces with their historic and officially used names are also indicated.
instructions on its filling. The respondents were mothers or caretakers.

Data related to breast-feeding, duration of breast-feeding, type of child nutrition, as well as feeding on demand or according to a schedule, were taken from the questionnaire. On the basis of those answers, the sample was divided into two groups of children: up to 2 years of age, and those between 2 and 5 years of age. There were 757 children up to 2 years of age, 357 (42.2%) boys and 400 (52.8%) girls. The group of children between 2 and 5 years of age comprised 1,180 children, 620 (52.5%) boys and 560 (47.5%) girls. The data were analyzed using the *χ²*-test, whereas the analysis of variance (ANOVA) was used to test the differences between the means. When ANOVA showed significant differences, Duncan post-hoc test was used. The differences with *p*<0.05 were considered statistically significant.

**Results**

**Prevalence of Breast-fed Children up to 2 Years of Age**

Almost 95% of the children up to two years of age were started being breast-fed, i.e., they were breast-fed for at least a day (Table 1). War-free areas of Croatia had the highest breastfeeding rate (95.9%), whereas in the war-affected (91.7%) and liberated (91.2%) areas that rate was lower. Among the war-free regions, the city of Zagreb had the highest (96.6%) and Lika and Banovina the lowest (91.6%) rate. However, neither of these differences were statistically significant.

**Duration of Breast-feeding of Children up to 2 Years of Age**

The average length of breast-feeding in the whole country was 3.4±2.9 months (Table 2), the longest in the war-free areas (3.7±3.1 months) and almost a month shorter in the war-affected areas (2.7±2.1 months, *p*<0.015) (Table 2). The longest duration of breast-feeding was recorded in Istria, Hrvatsko Primorje, and Gorski Kotar (3.9±3.4 months), compared to 3.4±3.0 months in Slavonia (*p*<0.037) (Table 2).

**Prevalence of Breast-feeding on Demand or a Schedule**

The UNICEF breast-feeding promotion strategy “Ten Steps to Successful Breast-feeding” recommends that babies should be fed on demand and not according to a schedule (15,26). As shown in Figure 2, 49.4% of the babies were fed when they demonstrated hunger and 43.3% according to a daily schedule (the mothers of remaining 8.3% answered “don’t know” or “equally”). These two practices were not equally distributed in different areas (*p*<0.001, *χ²*-test), with as many as 66.2% babies fed on demand in Zagreb, compared to only 33.7% in Dalmatia.

**Assessment of the UNICEF’s Breast-feeding Promotion Campaign**

The effects of the breast-feeding promotion campaign introduced by UNICEF in 1993, were indirectly assessed by comparing the breast-feeding rate in children up to 2 years of age with that in children 2-5 years of age in 1996. The younger age group was born when the campaign was in full implementation in Croatia, whereas the older age group was born at the beginning or shortly after the introduction of the breast-feeding promotion program. In the older age group, 9.3% of the children have never started being breast-fed, compared to 5.4% in the younger age group (*p*<0.002, *χ²*-test) (Table 3).

**Statistical Analysis**

Population indicators for the war-related and geographical regions of Croatia, as well as for Croatia as a whole, were calculated. Differences among the proportions were tested by the *χ²*-test, whereas the analysis of variance (ANOVA) was used to test the differences between the means. When ANOVA showed significant difference, Duncan post-hoc test was used. The differences with *p*<0.05 were considered statistically significant.

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### Table 1. Prevalence of breast-fed children under the age of 2 in Croatia in 1996

<table>
<thead>
<tr>
<th>Area</th>
<th>% Mothers practicing breast-feeding</th>
<th>95% CI</th>
<th>breast-fed in 1996</th>
</tr>
</thead>
<tbody>
<tr>
<td>Croatia</td>
<td>94.6</td>
<td>92.9-96.3</td>
<td></td>
</tr>
<tr>
<td>War-free</td>
<td>95.9</td>
<td>94.1-97.6</td>
<td></td>
</tr>
<tr>
<td>War-affected</td>
<td>91.7</td>
<td>87.0-96.4</td>
<td></td>
</tr>
<tr>
<td>Liberated</td>
<td>91.2</td>
<td>84.6-97.7</td>
<td></td>
</tr>
<tr>
<td>Zagreb</td>
<td>96.6</td>
<td>93.7-99.6</td>
<td></td>
</tr>
<tr>
<td>Northern Croatia</td>
<td>95.2</td>
<td>91.7-98.8</td>
<td></td>
</tr>
<tr>
<td>Lika, Banovina</td>
<td>91.6</td>
<td>85.7-97.4</td>
<td></td>
</tr>
<tr>
<td>Slavonia</td>
<td>94.0</td>
<td>90.4-97.5</td>
<td></td>
</tr>
<tr>
<td>Istria, Hrvatsko</td>
<td>96.2</td>
<td>90.8-100.0</td>
<td></td>
</tr>
<tr>
<td>Primorje, Gorski</td>
<td>93.9</td>
<td>89.7-98.1</td>
<td></td>
</tr>
<tr>
<td>Kotar Dalmatia</td>
<td>93.9</td>
<td>89.7-98.1</td>
<td></td>
</tr>
</tbody>
</table>

aBreast-feeding was defined as at least one day on breast-feeding, i.e., a start of breast-feeding.
bCI – confidence interval. There were no statistically significant differences between the groups (*p*<0.051, *χ²*-test).
Discussion

Our study revealed that babies in the war-free areas of Croatia were breast-fed significantly more often and longer than the babies in the war-affected areas. This is opposite to the expectation that mothers in war-affected areas would rely more on natural, i.e., war-independent type of feeding for their children. Although this study did not investigate direct causes of the decreased rate of breast-feeding in specific places, we believe that the understandable decrease in preventive activities, a fall in the level of health educational measures, and especially uncontrolled humanitarian donations were the main factors that caused the decrease in the prevalence of breast-feeding in the war-affected areas.

During the war in Croatia, large donations in the form of food were delivered on regular basis, and these included various milk formulas. Organizations which work to encourage breast-feeding (IBFAN – International Baby Food Association Network, IFEG – Infant Feeding in Emergencies Group, UNICEF, WHO, Red Cross) and other humanitarian organizations, which delivered baby foods, defined regulations for the delivery and correct use of milk formulas in extraordinary circumstances. They all pointed out the advantages of breast-feeding for both the baby and the mother, especially in unfavorable circumstances, and emphasized the fact that it brings emotional contact and that mother’s milk is sterile, has optimal temperature, immunological advantages, and other benefits

![Figure 2. Percent of breast-feeding in children aged 0 to 2 years on demand (open bars) and according to a daily schedule (closed bars) in different regions of Croatia in 1996. There was statistically significant difference in types of breast-feeding among the regions of Croatia (p=0.001, χ²-test).]

![Table 3. Comparison of the number of breast-fed and non-breast-fed children in two age groups in Croatia in 1996.]

<table>
<thead>
<tr>
<th>Breast-fed*</th>
<th>No. (% of children of age up to 2 years 2-5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>41 (5.2) 109 (9.3)</td>
</tr>
<tr>
<td>Yes</td>
<td>715 (94.6) 1,060 (90.7)</td>
</tr>
</tbody>
</table>

*Breast-feeding was defined as at least one day on breast-feeding, i.e., a start of breast-feeding.

In the war-free areas of the country, the best results in terms of the length of breast-feeding were seen in Istria, Hrvatsko Primorje, and Gorski Kotar. This was the consequence of a long-term promotion of healthy way of life in those areas. The region of Istria, and particularly the city of Rijeka, was one of the first regions in Croatia to systematically apply the breast-feeding promotion program, and the Rijeka’s maternity ward was the first in Croatia to get the title of “Baby-Friendly Hospital” (27).

According to the regulations in “Ten Steps to Successful Breast-feeding”, babies should be fed on demand and not according to a schedule (15). Mothers from Zagreb had the highest rate of breast-feeding on demand, probably because of a supporting atmosphere and widespread educational program which promoted breast-feeding.

The success of the breast-feeding promotion programs was indirectly confirmed by the increased rate of breast-fed children in the younger age group, whose parents have been longer influenced by breast-feeding promotion education, in comparison to children who were born at the beginning or shortly after the introduction of the breast-feeding promotion program. Actually, this is the first and only indicator of the effectiveness of the breast-feeding promotion campaign in Croatia.
Acknowledgment

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References


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