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CHILD HEALTH PROTECTION DURING EMERGENCY SITUATIONS

OLAĞANÜSTÜ DURUMLARDA ÇOCUK SAĞLIĞININ KORUNMASI

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ABSTRACT

Natural disasters such as earthquakes are emergency situations when the fragility of the entire society, especially children, increases. In emergency situations, breastfeeding is crucial due to its unique characteristics: nutrient and bio-immunological content, optimum temperature and readiness for the baby. Ensuring healthy nutrition, maintaining childhood vaccination, preventing infectious diseases, providing sheltering and child safety, and preserving mental health are the basic issues in protecting child health during emergencies. Following the children who have experienced a disaster currently is necessary regarding long-term physical and psychological effects. Moreover, monitoring the growth and development, maintaining the care of children with chronic diseases, and continuity of school attendance are essential under these circumstances. The aim of this article is to present the basic principles of child health protection during emergency situations.

Keywords: Child health, disasters, emergency situations, breastfeeding, wet nursing, vaccination

ÖZET

Deprem gibi doğal afetler, başta çocuklar olmak üzere tüm toplumun kırılganlığının arttığı acil durumlardır. Acil durumlarda, besleyici özelliği, biyoimmünolojik içeriği, ideal sıcaklıkta ve hazır olması nedeniyle benzersiz özelliklere sahip anne sütü ile beslenme çok önemlidir. Sağlıklı beslenmenin sağlanması, çocukluk çağı aşılarının uygulanması, bulaşıcı hastalıkların önlenmesi, barınma ve çocuk güvenliğinin sağlanması, ruh sağlığının korunması acil durumlarda çocuk sağlığının korunmasında temel konulardır. Afet yaşayan çocukların takibi, uzun süreli fiziksel ve psikolojik etkiler açısından gereklidir. Ayrıca büyüme ve gelişmenin izlenmesi, kronik hastalığı olan çocukların bakımının sürdürülmesi ve okula devamın sağlanması gereklidir. Bu makalenin amacı, acil durumlarda çocuk sağlığını korumanın temel ilkelerini sunmaktır.

Anahtar Kelimeler: Çocuk sağlığı, afetler, acil durumlar, emzirme, süt annelik, aşı uygulamaları

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GENİŞ ÖZET

Makalede olağanüstü durumlarda çocuk sağlığının korunması için gereken prensiplerin bilimsel veriler ışığında sunulması amaçlanmıştır.

Her koşulda bebeklerin ve küçük çocukların sağlıklarının korunması için ilk 6 ay tek başına anne sütü ile beslenmelerinin sağlanması ve anne sütü ile beslenmenin en az 2 yaşına kadar sürdürülmesi önerilmektedir. Anne sütü hayati önem taşır çünkü güvenlidir, besleyicidir, ideal sıcaklıktadır ve hazırlanması gerekmez. Besleyici özelliklerinin yanı sıra içerdiği antikorlar, lizozim, laktoferrin, oligosakkaritler, büyüme faktörleri gibi biyoaktif bileşenleri ile anne sütü bebeği birçok bulaşıcı hastalıktan korur ve ileri yaştaki kronik hastalık riskini azaltır. Afetlerde annelerin yaşadıkları stres nedeniyle annelerde süt inme refleksi baskılanabilmekte, geçici olarak süt yapımı azalabilmektedir. Bu durum doğru yaklaşım ile üç günde düzelmektedir. Annelerin bebeklerini sık emzirmeye ve uzun süre memede tutmaya devam etmeleri süt yapımını yeniden artırmaktadır. Her anne kendi beslenme durumundan bağımsız olarak bebeğini başarı ile emzirebilir. Emziren annelerin mümkün olduğunca emzirmeyi sürdürmeleri ve bebeklerin anne sütü almaları olağanüstü durumlarda daha da önemlidir. Bunun için anneler korunmalı ve desteklenmelidirler. Özellikle altı aydan küçüklerin anne sütü alamadıkları durumlarda sağlık çalışanlarının kontrolünde süt veren başka bir annenin sütanne olması sağlanabilir. Bu durumda anne sütü doğrudan memeden ya da hijyen koşullarına dikkat edilerek elle sağılıp fincanla verilebilir.

Dünya Sağlık Örgütü, UNICEF ve ülkelerin sağlık bakanlıkları olağanüstü koşullarda emzirmeye devam etmenin çok önemli olduğunu vurgulamakta, doğrudan halka mama dağıtımını önermemektedir. Anneden ayrı olması gibi bebeğin annesinin sütünü alamadığı özel koşullarda ve süt annenin bulunmadığı durumlarda formül mama gerekebilir. Kamu sağlık görevlilerinin kontrolü dışında hazır mama dağıtımı, anne sütünden yararlanmayı olumsuz etkilemekte bebeklerin büyüme ve gelişmesinde kısa ve uzun dönemde önemli sorunların yaşanmasına neden olmaktadır. Olağanüstü durumlarda formül mama ile beslenen bebekler için en güvenli tercih, suyla karıştırılması gerekmeyen sıvı bebek mamalarıdır. Tek seçenek toz formül mama ise; ölçü kaşığı kullanılarak mama hazırlanmalı, sulandırılması sırasında su sıcaklığı 70°C ve üzerinde olmalıdır. Mamanın soğutulması sulandırıldıktan sonra yapılmalıdır. Temizlik açısından hazırlanan mama biberon yerine fincan ile verilmelidir. Anne sütü olmayan ve mama ile beslenen 4 aydan büyük bebeklere meyve püresi, yoğurt ve sebze püresi uygun şekilde hazırlanarak verilebilir. Büyük çocuklarda kolay hazırlanan besinler tercih edilmelidir. Bölgede yetişen meyve ve sebzenin kullanımı sağlıklı beslenmenin sürdürülebilirliği açısından önemlidir.

Afetlerde ishaller ve solunum yolu enfeksiyonları en sık görülen çocuk ölüm nedenleri arasında yer alır. Anne sütü ile beslenen bebeklerde bu hastalıklar daha az görülür ya da görülse de daha hafif seyreder. Anne sütü yerine kullanılan ürünler özellikle toz mamalar kontamine su, kötü hijyen ve besleme aletlerinin uygun olmayan şekilde temizlenmesi enfeksiyon riskinin artmasına neden olur. Anne sütü almayan bir bebeğin patojenlerle enfekte olma, yetersiz beslenme ve ölüme yol açan çok sayıda ağır hastalığa yakalanma olasılığı daha yüksektir. Deprem sonrası yapılmış bir çalışmada; bağışlanan bebek maması alanlarda ishal insidansının almayanlara göre daha yüksek olduğu belirlenmiştir. Mamaların kontrolsüz dağıtımı, bebeklerde ve küçük çocuklarda ishal riskini artırmaktadır.

Afetlerde aşı uygulamaları aksayabilmektedir. Çocukların aşılanma durumları değerlendirilmelidir. Önceki aşı kayıtlarına ulaşılabiliyorsa yaşa uygun aşılamaya devam edilmeli, kayıtlarına ulaşılamıyorsa hiç aşısız kabul edilerek program oluşturulmalıdır. Kesintiye uğramış programlarda aşılama kalınan yerden sürdürülür. Fekal oral bulaş riskinin arttığı olağanüstü durumlarda hepatit A ve polio aşılamasının aksamaması çok önemlidir. Sağlık hizmetlerine erişimde güçlük, yerleşim kamplarındaki aşırı kalabalık ve hızlı nüfus hareketleri kızamık gibi bulaşıcı hastalıkların riskini artırır. Kızamık Eliminasyon Programı'nda belirtildiği gibi riskli bölgelerdeki; 6 ay üzeri çocukların kızamık aşılanma durumlarının değerlendirilmesi gerekmektedir. Depremde yaralananlar tetanos profilaksisi açısından değerlendirilmelidirler. Kafa travması olanlar olası beyin omurilik sıvısı kaçağı nedeniyle konjuge pnömokok aşısı ile yaşına uygun eksiksiz aşılanmalı, iki yaşından büyüklere, konjuge pnömokok aşısından en erken 8 hafta sonra polisakkarit pnömokok aşısı da yapılmalıdır. H. İnfluenza Tip b, Meningokok ACWY ve B aşıları da çocuğun yaşına ve aşılanma durumuna göre uygulanabilir. Afetlerde deri enfeksiyonlarından korunmak için çocukların saç, tırnak ve deri temizliğinin düzenli olarak yapılması; hava koşullarına uygun temiz kıyafetlerin ve ayakkabıların giyilmesi önemlidir.

Depremlerde güvenli barınma alanlarının sağlanması önceliklidir. Çocuklu aileler, kimsesiz ya da refakatçisiz çocuklar en kısa sürede güvenli alanlara nakledilmelidirler. Bölgelerde çocuklara kol bandı takılmalıdır. Doğal afetlerde çocuk istismarı riski artmaktadır. Bu nedenle, bölgedeki çocuklara uygun sosyal desteğin ve okul devamlılığının sağlanması çok önemlidir. Çocuk güvenliğinde kamu görevlileri yer almalı, refakatçisiz çocukların korunması devlet tarafından organize edilmelidir.

Afetlerde çocukların sevgi ve ilgiye ihtiyaçları artar. Anne sütü ile beslenmenin sürdürülmesi; emzirme sırasında salınan hormonların etkisi ile hem anne hem bebeğin ruhsal sağlığı için önemlidir. Oyunla meşgul etmenin yanı sıra beş yaşından büyüklere görev vermek; endişelerini hafifletir, onları oyalar. Spor aktiviteleri, çocukların stresle baş etmelerine yardımcı olur. Çocukların günlük düzenlerinin olması kendilerini güven içinde hissetmelerini sağlar. Yetişkinlerin fiziksel ve ruhsal sağlıklarının iyi olması, bakım verdikleri çocukları da olumlu etkiler. Çocukların yetişkinleri üzgün veya ağlarken görmelerinde sakınca yoktur; ancak çığlık atmak, etrafa vurmak gibi davranışlar korkutucu olabilir. Çocuklara anlaşıldıkları ve güvende oldukları hissettirilmelidir. Afet sonrası çocuklarda olayı yeniden yaşama ve yüksek kaygı görülebilir. Bulguların bir aydan uzun sürmesi travma sonrası stres bozukluğunu düşündürmeli ve sağaltımı için uzmanlar ile iş birliği yapılmalıdır.

Sonuçta olağanüstü koşullarda çocuklar en hassas grubu oluştururlar. Bu nedenle afetlerde çocuk sağlığına yönelik tedbirler iyi bilinmeli ve süratle hayata geçirilmelidir.

INTRODUCTION

In natural disasters, the fragility of the entire society increases, but children and the elderly constitute the most vulnerable group. The mortality rates in children increase during emergency conditions (1-3). Acute respiratory infection, diarrhea, malnutrition and communicable diseases like measles are the leading causes of child deaths in disasters (4).

Healthy nutrition and breastfeeding, prevention of infectious diseases and vaccination, sheltering and mental health are the basic issues for protecting children's health during emergency situations. The aim of this article is to explain these issues in detail in the light of current scientific studies.

Ensuring healthy nutrition, maintaining breastfeeding

In all circumstances, the World Health Organization (WHO), UNICEF and health ministries of the countries recommend to start breastfeeding immediately after birth, continue exclusive breastfeeding for the first 6 months, and carry on breastfeeding for up to 2 years and beyond to protect the health of infants and young children (5,6).

Breast milk is crucial because it is safe, nutritious, at an optimum temperature, accessible, ready to use and provides protection against infections. Breast milk is a living substance and has a dynamic structure. In addition to its nutritional properties, soluble components such as secretory antibodies, lysozyme, lactoferrin, oligosaccharides, and growth factors; cellular components such as neutrophils, macrophages, epithelial cells; and microbiota components such as Bifidobacterium, constitute bioactive components in breast milk. With its both nutritional and bioactive content, ideal nutrition is provided, infectious diseases are prevented, and the risk of chronic diseases is reduced. Most of these effects continue throughout life. In each feeding period, there may be changes in the components of breastmilk according to the biological, social, and psychological needs of the mother and baby. For example, it is now well known that antibodies increase in the mother's milk during a mother's or infant's infectious disease (7,8). Underinvestment in the protection, promotion and support of breastfeeding will lead to the lack of benefits of breastfeeding and an estimated US$341.3 billion lost worldwide each year (9). Successful breastfeeding is a common responsibility of not only the mother but also the social environment.

According to Turkish official statements, more than 2500 babies were born during the first week after the earthquake in the region in 2023 (10). In emergency situations, newly delivered mothers must be supported to start breastfeeding immediately after birth and all breastfeeding mothers should continue breastfeeding. Milk production may decrease temporarily in emergencies due to the letdown reflex suppression with the effect of stress and shock, as seen in some mothers during the 1999 earthquake in the Marmara region. This suppression improves with the right approach in three days. If mothers continue to breastfeed their babies at least 8 times in 24 hours, during night as well, and keep the baby at the breast, milk production will increase again (11). Hormones such as oxytocin and prolactin secreted during breastfeeding also reduce stress in mothers and babies (12). Therefore, breastfeeding counseling becomes even more important in emergency situations (1,4,9,12-15). The algorithm for maintaining breastfeeding in the first six months of life in emergency situations is summarized in Figure 1. Hand expression of the breastmilk (Figure 2) and cup feeding (Figure 3) may be needed under these circumstances.

If the mother needs to use medication due to a health problem, the compatibility of drugs used with breastfeeding should be checked without interrupting breastfeeding, and the drug can be changed in case of doubt. Situations where breastfeeding is not recommended because of an infectious disease or the mother's medications are very rare (Figure 1, c section). LACTMED, an up-to-date database on drug use during breastfeeding, can be used (16).

When the biological mother is not available, another mother can breastfeed under the control of health workers (4). However, it should be ensured that the baby and nursing mother to-be have no contraindications for breastfeeding (17-19). Health professionals should make a detailed assessment of these criteria (13).

The health ministries of all countries in the world, with the leadership of WHO and UNICEF, emphasize that it is crucial to continue breastfeeding under emergency conditions and do not recommend distributing formula directly to the public (4-6,15). In exceptional circumstances, such as the loss of the mother, formula milk can be given if there is no other available breastfeeding mother (Figure 1) (4-6, 20). The distribution of the formula should be under the strict control of the public health personnel. The situations in which formula milk should be given are very limited and should be determined by public health officials. The safest choice for formula-fed infants in emergencies is ready-to-use infant formulas that do not require water (13,20). However, if the only option is a powdered formula, attention should be paid to preparing it under sterile conditions. Accessing safe water for cleaning feeding bottles and teats could be a problem. If a reliable water source is unavailable, the equipment must be boiled in water for 20 minutes before each feeding. However, the prepared food should be given in a cup to minimize contamination (Figure 3) (4,14,21). Once opened, infant formula containers must be stored in a cool, dry place with a tightly closed lid (20).

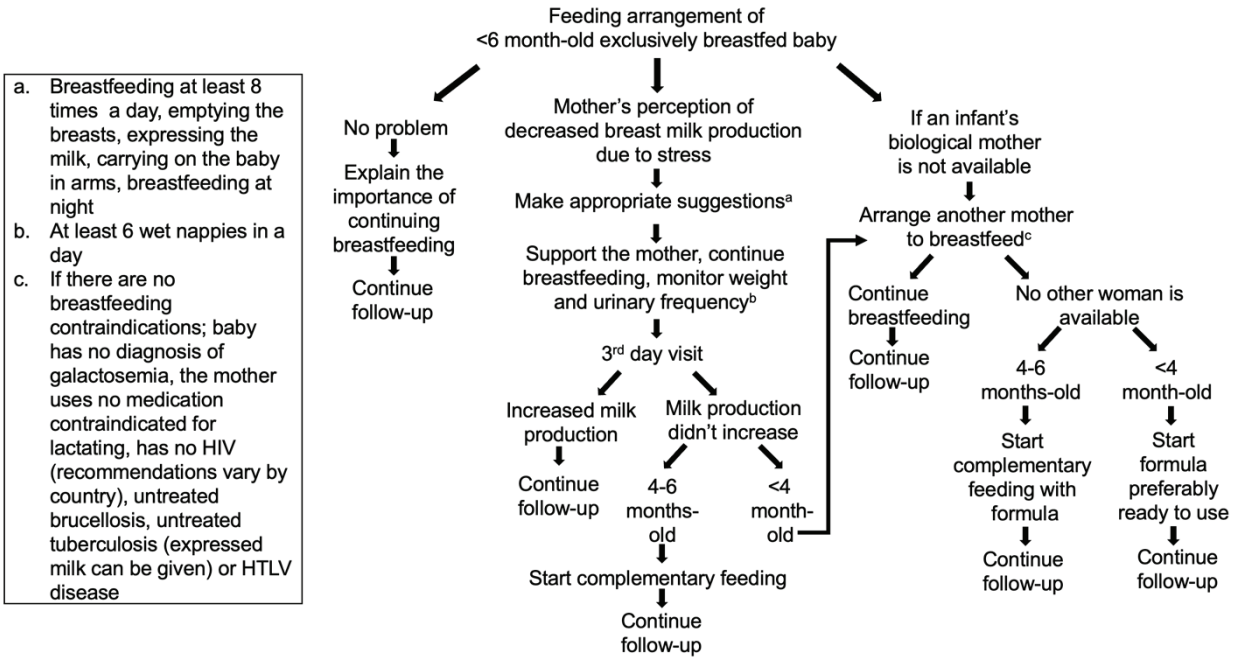
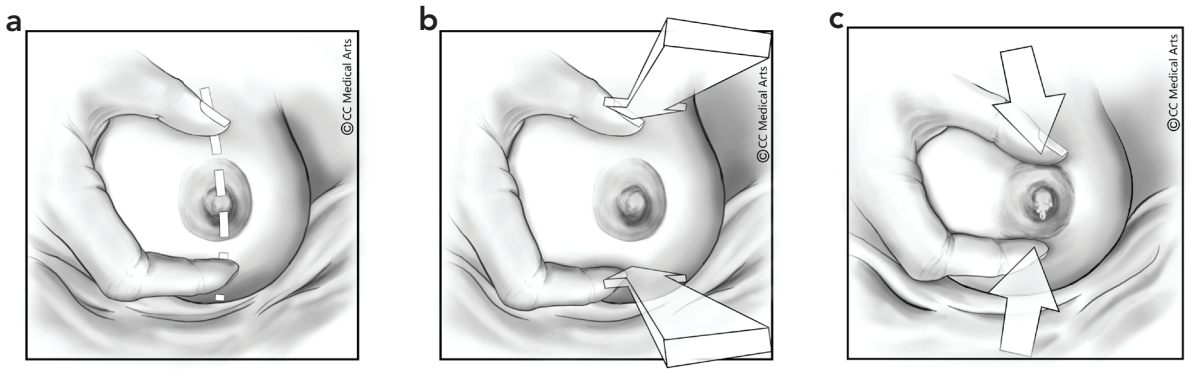


Figure 1: Breastfeeding in the first six months of life in emergency situations (4,16,17,19).



- The index finger under the brown part of the breast, the thumb on the breast, above the edge of the brown area. The nipple on the same line between the thumb and index finger (a).
- Thumb and index fingers are pressed against the chest wall to feel the underlying tissue (b).
- The fingers are brought closer together to tighten the breast tissue, and then the fingers are released (c).
- This movement should be repeated regularly, and the mother should adjust the speed, pressure, and rhythm according to her own needs.

Figure 2: Expressing milk by hand

The persons who will provide formula feeding should be informed about the safe preparation of formula (4,). A safe water source will be bottled water (22). Formula milk should be prepared with boiled water and a sterilized measuring spoon. It is important that the water temperature is 70°C and above until the powder is dissolved, and cooled after dissolution (23). If any made-up formula is left in the bottle after a feed, it must be discarded. Properly prepared fruit, yoghurt, and vegetable puree can be given to infants 4 months and older who do not receive breast milk and are fed with formula (14,24).

For older children, foods that are easy to prepare can be consumed. Fruits and vegetables grown in the region are essential for a healthy diet's sustainability. Regulation of easily accessible foods such as eggs and milk to ensure protein intake is necessary for healthy nutrition in collective living conditions after disasters.

Figure 3: Cup feeding technique (21)

Infectious diseases such as diarrhea and respiratory infections are less common in breastfed babies, and when rarely seen, the course tends to be milder. Breast milk substitutes, especially powdered formula, may also act as a vector of infection due to contaminated water, poor hygiene and improper cleaning of feeding utensils. A non-breastfed infant is more likely to be infected with pathogens, malnutrition, and many serious illnesses that lead to death (1,25). On the other hand, introducing a bottle of formula to a breastfed baby may adversely affect the infant's breastfeeding irreversibly. A study conducted after the earthquake, which took place in Indonesia in May 2006, reported that infant formula consumption of children aged 0-5 months was 32% before the earthquake, and this rate increased to 75% with the donated formula after the earthquake; consequently, the rate of breastfeeding decreased. It was found that the incidence of one-week diarrhea was higher in those who received donated formula than in those who did not, and the rate of diarrhea in children aged 12-23 months increased five times compared to the pre-earthquake time period. The research results showed that the uncontrolled formula distribution increased the risk of diarrhea among infants and young children in emergency situations such as earthquakes (26).

Prevention of infections and vaccination

In the disaster areas, difficulty in accessing clean water, infrastructure damage, crowded temporary living environments, and excessive population movement pose risks of some epidemic situations such as diarrhea, pneumonia, and scabies (4, 27).

Hand cleaning with soap and water for 15 seconds becomes even more important under emergency situations. However, cleaning wipes can be used if there is no access to soap and water. Cleaning and brushing hair, nails, and skin regularly becomes even more critical in emergency situations (14,28). Disposable baby diapers are needed to prevent skin infections and should be changed immediately if dirty, and every 3 hours, even if not dirty. Leaving the diaper area open for 20 minutes every day helps to prevent diaper rash. If a diaper rash appears, starting the treatment immediately is necessary to prevent severe skin infections.

In emergency situations, where infectious diseases increase due to poor environmental conditions, there may be disruptions in immunizations (29,30). Vaccination of children should be evaluated. If the previous vaccination records can be accessed, age-appropriate immunization should be checked. If their records cannot be reached, they should be considered unvaccinated, and a vaccination program should be established. In this regard, the Ministry of Health guidelines and the vaccination recommendations for the unvaccinated child on the Social Pediatrics Association website can be used (31). The interrupted or delayed vaccination program should be resumed from where it had been left off (32).

Considering that the risk of fecal-oral transmission may be increased in disasters, hepatitis A and polio vaccination should not be missed. Difficulty accessing health systems, overcrowding in camps, and rapid population movements significantly increase the risk of measles infection (33). As pointed out in the Measles Elimination Program of the Ministry of Health of Türkiye, risky areas should be determined. In these risky areas, everyone aged above six months should be evaluated to be vaccinated against measles (34).

Children injured during an earthquake must be evaluated for tetanus prophylaxis (35) (Table 1). Children with head trauma and possible cerebrospinal fluid leakage must receive a pneumococcal conjugate vaccine (PCV13) as per the standard schedule. If these children are older than 2 years of age, they should also receive the pneumococcal polysaccharide vaccine at least 8 weeks after the last PCV13 (36,37). Administration of one dose of H. Influenza Type B vaccine is also recommended after 60 months of age, even if fully vaccinated. Meningococcal vaccination can be considered for these children as well (36-38).

After disasters, the population in the camps is the most socioeconomically disadvantaged group and may be more likely to be under-vaccinated (2). Furthermore, con-

Table 1: Tetanus vaccine and immunoglobulin recommendations for injuries (35)

Vaccination history (dose)	Clear small wounds		All other wounds [a]	
	Vaccine [b]	TIG [c]	Vaccine [b]	TIG [c]
Unknown or <3 dose	Yes	No	Yes	Yes
3 or more doses	No 'Yes' (if >10 years have passed since the last dose)	No	No 'Yes' (if >5 years have passed since the last dose)	No

a: Other wounds; wounds contaminated with feces, soil, saliva, penetrating wounds, crushing wounds, burn and frostbite wounds and other dirty wounds, b: Vaccine administration can be done as DTaP, Tdap or Td, c: TIG: Tetanus immunoglobulin; TIG dose is 250 IU for all ages.

sidering the excessive population movement after the earthquake, necessary arrangements should be made to continue immunization.

Sheltering and child safety

Providing safe shelters after disasters is a priority for child health (30). The first step in preventing an unsafe environment for children after a disaster is ensuring to receive humanitarian support (39). Families with children and unaccompanied or orphaned children should be transferred to safe areas as soon as possible. Persons and all children living in the disaster areas should be listed. Armbands must be provided to all children. Public officials play a crucial role in child safety. They organize the government protection of unaccompanied children (14,30).

Studies show that child abuse increases during emergency situations (30, 39,40). In the circumstances such as the loss of a parent during natural disasters or living in camp areas, children are faced with risks such as accident, disappearance, kidnapping, and early marriage. Therefore, it is vital to provide appropriate social support to children at risk, maintain school attendance, and ensure that care and support services are provided to children in emergency situations.

Mental health and communication with the child

After disasters, children may experience anxiety, fear, sadness, sleep disturbances, difficulty in concentration, irritability, and outbursts of anger. Stress and mental problems affect children's physical health, quality of life, and behavior at home, school, and other social settings (41). Children's need for love and attention increases in disasters. Breastfeeding and hugging are effective in calming babies (42). It is helpful to keep children busy with various games. Ensuring children's sleeping and feeding times are in daily order will make children feel safe. Adults' good physical and mental health also positively affects the children. There will be no problem if children and teenagers see adults sad or crying, but overreactions such as screaming, banging or kicking can be frightening for children (43).

Play and sports activities are among the best ways for children to cope with stress. Instead of watching television, engaging in interactive play activities makes it easier to overcome post-traumatic stress reactions. Establishing pre-fabric schools in the area as soon as possible is very important in this respect (30). Children are allowed to express their fear, anxiety or anger. This "non-permanent" situation should be kindly explained.

Children directly exposed to a disaster may become sad when they see or hear things that remind them of the unfavorable past events. Exposure to mass media related to the disaster can make them uneasy. In addition, responsibility can be given to children to support others in the disaster area to regain their sense of control and help them to manage their emotions. However, participating in post-earthquake cleaning activities in the debris field is not appropriate for small children (41,44-46).

The communication principles during the first encounter are listed in Table 2 (42). After traumatic events, post-traumatic stress reaction, anxiety, and depression-like symptoms may occur in children. During emergency situations, post-traumatic stress reaction should be considered in the presence of the main findings, which are re-experiencing the trauma, avoidance of the trauma reminders, increased anxiety and overstimulation (47). Observation of these findings in the first month is defined as an acute stress reaction, and if it lasts longer than one month, considered as post-traumatic stress disorder (PTSD). If PTSD is present, cooperation with child and adolescent psychiatry and mental health specialists is required. PTSD in children after disasters is reported to be between 5% and 58% (47). PTSD symptoms may continue in children for two or three years (48). Depression and anxiety may accompany PTSD in children and adolescents (47,48). Suicidal thoughts were also reported to be common among adolescents after the disaster (49).

The frequency of internalization (finger sucking, depression, etc.) and externalization (hyperactivity) type behavior problems increases in the children of parents with PTSD. Therefore, supporting the mental health of

Table 2: Communication principles with children in the disaster area during the first intervention period (41)

- Calm, compassionate and ready to listen approach
- Introducing yourself by name and explaining the reasons to be there.
- Short and clear talk; maintaining eye contact at the same level is important while speaking.
- Informing the child that he is safe, and calling him by name if known.
- Providing information about what has been done. For example, it should be said that "we are going to a hospital by ambulance to check your health".
- Being sensitive to the need of the child.
- Avoiding being overly anxious, sad, affectionate or angry in the presence of the child
- Limited use of communication tools (TV, social media) for the news about disaster next to the child.
- Keeping children away from media exposure for privacy and respectability.
- Encouraging children to speak spontaneously, not forcing
- Obtaining children's consent while helping them.
- Avoiding to give information about death or loss during the first contact.
- Making explanations about the loss, in the presence of psychologists or social workers.
- Taking information (name, surname, telephone number etc.) about the child's parents and relatives, recording and reporting to the relevant units.

parents is also important in terms of the child's mental health (50). Furthermore, continuing breastfeeding has a protective effect in the short and long term on the mental health of both mother and baby, with the impact of hormones released during breastfeeding (12).

CONCLUSION

Ensuring healthy nutrition, preventing infectious diseases and maintaining childhood vaccination, providing sheltering and child safety, and preserving mental health are the basic issues in protecting child health during emergencies. All children who have experienced a disaster need to be closely followed up regarding the long-term physical and psychological effects of the disaster. Preservation of breastfeeding, close monitoring of growth and development, and maintenance of school attendance are crucial for child health protection.

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