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Forensic Sciences and refugee children: identification and family reunification in humanitarian crisis scenarios

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Abstract

Background: Armed conflicts, ethnic persecution, and humanitarian disasters (Fig. 1) have led to the displacement of millions of people, including many children who, during these journeys, are often separated from their parents or guardians [1-3]. Forensic sciences have proved to be fundamental in identifying unaccompanied minors and reuniting families, using techniques such as forensic genetics, biometrics, and document analysis [4-6]. **Objective:** Review of recently published literature on forensic science for unaccompanied refugee children identification, examine the applied techniques, collaborative efforts, ethical challenges, and the need for standardized protocols and training. **Methods:** A systematic review of the scientific literature was carried out (Scopus, PubMed, and IEEExplore databases) using the keywords "forensic science", "child refugees", "family reunification", "genetic identification", and "humanitarian crisis". Studies published between 2020 and 2025 and peer-reviewed were considered, and articles outside this period, without access to the full text or which did not directly address the topic, were excluded. **Results:** Of the 391 articles identified, 106 met the inclusion criteria. These articles mainly deal with the use of genetic profiles (e.g., STRs, mitochondrial DNA), biometric systems (e.g., fingerprints, facial recognition), and shared international databases to identify minors (e.g., INTERPOL - Missing Children Database and the Child Sexual Exploitation Database - ICSE, EUROPOL - AP Twins/Child and Offender Identification System in the EU). There has been a growing trend toward collaboration between government bodies, NGOs, and forensic institutions. However, several studies warn of the ethical and legal difficulties in using genetic data on vulnerable populations, especially without proper consent from parents or guardians. **Conclusions:** Forensic science is essential for protecting refugee children in crisis scenarios. Technological advances enable increasingly rapid and accurate identification, contributing to family reunification and international human rights application. However, significant challenges remain, such as the need for clear ethical standards, shared international protocols, and specialized training for professionals involved in this type of research. Therefore, forensic science must be guided by principles of humanity, safety, and respect for children's rights as the rule of law.

Figure 1. Main causes of child refugees.

Keywords: forensic databases; humanitarian crisis; international humanitarian law

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