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Cross-sectional growth assessment of children in four refugee camps in Northern Greece

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ABSTRACT

Background: Previous research has identified a high prevalence of growth abnormality among Syrian refugees in refugee camps in Jordan and Lebanon. There are few published data describing the growth status of children who are refugees in Europe.

Methods: Refugees with up to 5 completed years of age in four refugee camps in Northern Greece were invited to participate in growth screening for clinical purposes. Mid-upper arm circumference (MUAC), weight for age (WFA), weight for height (WFH) and height for age (HFA) were measured. The World Health Organization (WHO) normal ranges and 'WHO Anthro' were used to calculate the prevalence of high WFH and low WFA, WFH, HFA, or MUAC.

Results: In total 177 (27% of children under 5 years in the four camps) were included. The male-to-female ratio was 1:1.04. Weight and height data were recorded for 114 children, and MUAC was recorded for 106 children. Two children (1.9%; 95% confidence interval [CI] 1.0–3.7%) had a MUAC more than 2 standard deviations (2SD) below the WHO mean value. Ninety-five percent were in the normal range for WFA. Four (3.7%; 95% CI 1.4–9.4%) were underweight (>2SD below the WHO median). Seventeen (16%; 95% CI 9.5–24.9%) had a high WFH, and 4 (3.7%; 95% CI 1.4–9.6%) were 2SD below the WHO median. Nineteen children (17.4%) had a low HFA, including 3 children under 1 year of age (13% of those under 1 year).

Discussion: Results demonstrated low prevalence of underweight for height, but high prevalence of stunting, suggesting chronic malnutrition. We recommend empirical micronutrient supplementation for children younger than 5 years and pregnant and breast-feeding women. Further research on the nutritional status of child refugees in camps in Greece is warranted to understand the cause of stunting and scope of any micronutrient deficiencies.

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Introduction

Since 2011, approximately half of the Syrian population have been displaced internally or to neighbouring countries due to protracted conflict, destruction of infrastructure, food insecurity, and poverty.¹ In 2016, 355,361 refugees arrived in Greece by sea, of whom 25.4% were children.²

There is scant published literature on the nutritional status of Syrian refugees. In Syrian children resident in refugee camps in Jordan, rates of global acute malnutrition were low (1.2%) but prevalence of stunting was high (17%).³ In Za'atari refugee camp in Jordan, 48.7% of children aged 6–59 months and 64% of children under 24 months were anaemic.⁴ A cross-sectional study of over 2000 Syrian refugee children in Lebanon, Jordan and Iraq found that up to 21% were stunted.⁵ Middle Eastern adult and child refugees arriving in Australia are also found to be suffering from micronutrient deficiencies.⁶

Stunting is defined as low height for age (HFA) and reflects cumulative effects of long-term undernutrition or malnutrition, poor environmental conditions or other restrictions of growth potential. Micronutrient deficiencies occur when essential vitamins and minerals (e.g. iron, zinc and calcium) are not ingested or absorbed sufficiently and are an independent indicator of increased child mortality. Stunting is associated with increased morbidity from gastroenteritis⁷ and respiratory infections⁸ in the under 5-year age group, increased all-cause mortality,⁹ and increased risk of decreased cognitive function later in life.⁹

This study was carried out in four camps in Northern Greece where the Syrian American Medical Society Global Response (SAMS-GR) was providing primary health care in 2016 and 2017. In three of the camps over 95% of the population were Syrian, and the remainder were Iraqi; the fourth camp accommodated a Yazidi population, primarily from Iraq. There was no micronutrient supplementation, and the rates of exclusive breastfeeding are undocumented. Breastfeeding support and infant formula was provided by a non-governmental organisation.

We carried out a growth assessment to inform appropriate nutritional support for child refugees in Greece and in similar settings.

Methods

During September 2016, SAMS-GR health professionals received training on collection of anthropometric indicators from children. Refugee families were invited to attend SAMS-GR clinics for routine growth monitoring. Weight, height, mid-upper arm circumference (MUAC), and the date of birth of children aged up to 5 completed years (up to 60 completed months of age) were collected. For any child where gender had not been recorded, this was deduced from the name where possible or randomly assigned where the name could have been for a male or a female.

Data were entered in the WHO Anthro software to calculate weight for age (WFA), weight for height (WFH), HFA and body mass index (BMI) for age for individuals, and mean,

range and z scores for the population. Any child for whom weight or height were not recorded was excluded from these analyses.

Underweight is defined as being more than 2 standard deviations (2SD) below the WHO Child Growth Standards median for WFA, stunting is more than 2SD below WHO standards for HFA, and wasting is defined as more than 2SD below the median for WFH. Children more than 2SD above the WHO Child Growth Standards WFH median or above WHO BMI for age standards are considered overweight.

Acute malnutrition was identified as an MUAC more than 2SD below the WHO mean value. Any child in the sample with MUAC recording was included in this analysis, even if weight or height data were unavailable.

Results

Measurements were collected from 177 children aged below 5 years, representing 27% of the reference population in the four camps. Of these children, weight and height data were collected for 114 children and MUAC data were recorded for 106 children. Of the sample, 20.3% (36 children) were aged below 1 year (0–11 months), of these 26 children had weight and height measurements. Gender was not recorded for 9 of 177 children. After assignment of gender according to name or random assignment, the sex ratio was 1:1.04 male:female. Eighty-eight of the children lived in a Yazidi refugee camp (49.7%), and the remaining 23% lived in one of the three Syrian refugee camps (Table 1).

The height range was from 54 cm to 110 cm with mean 85.1 cm and median 87.3 cm. The weight range was 4.7 kg–18.5 kg with mean 12.4 kg and median 12.8 kg. The MUAC range was 12.5 cm–20.5 cm with both mean and median 15.8 cm (Table 2).

Results demonstrated a low prevalence of severe acute malnutrition Two children (1.9%; 95% confidence interval [CI] 1.0–3.7%) had an MUAC more than 2SD below the WHO mean value.

Table 1 – Sample characteristics.

	Number of children	Proportion of sample
Age in months		
0–11	36	20.3%
12–23	36	20.3%
24–35	36	20.3%
36–47	33	18.6%
48–59	36	20.3%
Total	177	100%
Gender		
Male	90	50.8%
Female	87	49.2%
Total	177	100%
Camp		
Syrian refugee camp 1	3	1.7%
Syrian refugee camp 2	66	37.3%
Syrian refugee camp 3	20	11.3%
Yazidi refugee camp	88	49.7%
Total	177	100%

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