

ORIGINAL ARTICLE

Influence of malnutrition upon all-cause mortality among children in Swaziland



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KEYWORDS

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Stunting;
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Abstract

Objective: To analyze the effect of the type of malnutrition, sex, age and the presence of edema upon all-cause mortality in children under 5 years of age.

Material and methods: A cross-sectional study was conducted during 2010 and 2011 in Swaziland. Sex, age, weight and height were taken to classify nutritional status according to the 2006 WHO growth standards: stunting (low height for age), wasting (low weight for height or low body mass index for age) and underweight (low weight for age). The sample (309 boys and 244 girls under 5 years of age) was analyzed by sex and age groups (under and equal/over 12 months). The association between variables was evaluated using the χ^2 test. Cox regression analysis (HR, 95% CI) was used to assess the likelihood of mortality.

Results: The mortality risk in malnourished children under one year of age was lower among females and increased in the presence of severe edema. Wasting combined with underweight increased the mortality risk in children under 12 months of age 5-fold, versus 11-fold in older children. The combination of stunting, wasting and underweight was closely associated to mortality. Stunting alone (not combined with wasting) did not significantly increase the mortality risk.

Conclusions: Sex, severe edema and wasting are predictors of mortality in malnourished children. Regardless of these factors, children with deficiencies referred to weight for height and weight for age present a greater mortality risk in comparison with children who present stunting only.

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PALABRAS CLAVE

Malnutrición;
Desnutrición crónica;
Desnutrición aguda;
Bajo peso;
Edema

Influencia de la malnutrición en la mortalidad por todas las causas en menores de Suazilandia**Resumen**

Objetivo: Analizar el efecto del tipo de malnutrición, de la edad, el sexo y la presencia de edema sobre la mortalidad en menores de cinco años.

Material y métodos: Estudio transversal llevado a cabo durante 2010 y 2011 en Suazilandia. Se tomaron el sexo, la edad en meses, la talla y el peso y se clasificó el estado nutricional de los menores considerando: desnutrición crónica (*stunting* o baja talla para la edad) y bajo peso para la edad (*underweight*) de acuerdo a los estándares de crecimiento de la OMS del 2006. La muestra (309 niños, 244 niñas, menores de 5 años) se analizó por sexo y edad considerando separadamente los menores y mayores de 12 meses. La asociación entre variables se evaluó utilizando el test de χ^2 y la regresión de Cox (HR 95% CI) fue utilizada para determinar la probabilidad de muerte.

Resultados: El riesgo de muerte en los menores malnutridos menores de un año es menor en las niñas y aumenta significativamente con la presencia de edema severo. La desnutrición aguda combinada con el bajo peso multiplica por cinco el riesgo de mortalidad en los menores de 12 meses y por once en los mayores de un año. La combinación de desnutrición crónica, aguda y bajo peso está estrechamente asociada a la mortalidad. La malnutrición crónica por sí sola no incrementa significativamente el riesgo de muerte.

Conclusiones: El sexo, la severidad del edema y la desnutrición aguda son predictores de mortalidad. Con independencia de estos factores, los menores con déficit de peso para la talla o de peso para la edad presentan mayor riesgo de mortalidad que los menores que padecen únicamente desnutrición crónica.

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Introduction

The synergistic effect of malnutrition and infectious diseases on children mortality has been widely described.¹⁻³ The assessment of nutritional status by anthropometric indicators highlights the influence of each different type of malnutrition on the probability of death.⁴ Authors such as Black et al.⁵ estimated this probability at 14.4% for children with low weight forage (underweight), at 14.7% for children with low height for age (stunting) and at 20.0% for low weight for height (wasting). Other studies have found a stronger risk of mortality associated with underweight^{6,7} respect other anthropometric index. In addition, the mortality risk can be increased with the joint presence of various types of malnutrition.⁸

In cases of the severe acute malnutrition, known as kwashiorkor,⁹ edema occurs as a result of interstitial fluid retention. This nutritional edema, affects the children weight masking both weight deficiency for height (wasting) and for age (underweight). Therefore, it is essential to consider this situation for anthropometric diagnosis. Moreover, biological variables such as sex and age have a differential effect on the risk of malnutrition and mortality,^{10,11} although with different results depending on the country of study. For example, in Ethiopia, male sex has been identified as one of the risk factors of malnutrition¹² but in countries like India, girls are often disadvantaged compared to boys.¹⁰⁻¹³

Data about broad global regions clarify the relationships between anthropometric indicators and associated

mortality, but do not allow knowing the specific situation of each country.¹⁴ It is therefore necessary to analyze each particular context, in order to prioritize nutrition interventions and to improve the design of the programs. With the goal of improving the management of malnutrition, the aim of this study is to determine the influence of each type of malnutrition on all-cause mortality among an under five years sample from Swaziland, as well as the effect of sex, age and the presence of nutritional edema.

Material and methods**Sample**

Data came from a prospective cohort belonging the 2010–2011 campaign carried out by the non-governmental organization (NGO) Action Against Hunger (ACF-International) in the four regions of Swaziland (Shiselweni, Hhohho, Lubombo and Manzini). The study was carried out with anonymous data from children admitted to health-care and nutritional recovery centers linked to the NGO. Children are brought to the center by their own families or staff of the organization with the parental authorization, in where they are diagnosed by local health staff and, depending on their status, they could be discharged, admitted or transferred to special centers. In order to analyze mortality pattern, the children were followed from their arrival to the center, until their death. The duration of the mean stay was 119.08 ± 4.5 days.

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