



Original/*Obesidad*

## Thao-Child Health Programme: community based intervention for healthy lifestyles promotion to children and families: results of a cohort study

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### Abstract

**Introduction:** childhood obesity is one of the main public health concerns. The multifactorial and multilevel causes require complex interventions such the community based interventions (CBI). Thao-Child Health Programme is a CBI implemented in Spain since 2007.

**Goal:** show the Thao methodology and the latest cross-sectional and longitudinal results.

**Methods:** longitudinal cohort study (4 years of follow-up) and cross sectional study.

**Results:** the longitudinal study found an increase of 1% in the overweight prevalence after a follow-up of 4 years of Thao-Programme implementation in 10 municipalities with 6697 children involved. The cross-sectional study carried out with 20636 children from 22 municipalities found a childhood overweight prevalence of 26.6%.

**Discussion:** currently a brake in the increase of childhood overweight prevalence is considered a success due to the high prevalence worldwide. More studies well methodologically performed are needed to know the efficacy of the CBI's in this field.

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Key words: *Pediatric obesity. Intervention studies. Life-style. Child.*

### PROGRAMA THAO-SALUD INFANTIL: INTERVENCIÓN DE BASE COMUNITARIA DE PROMOCIÓN DE ESTILOS DE VIDA SALUDABLES EN LA POBLACIÓN INFANTIL Y LAS FAMILIAS: RESULTADOS DE UN ESTUDIO DE COHORTE

### Resumen

**Introducción:** la obesidad infantil es una de las principales preocupaciones de salud pública. La etiología multifactorial y multinivel requiere de intervenciones complejas como las intervenciones de base comunitaria (CBI). El Programa Thao-Salud Infantil es una CBI implementada en España desde 2007.

**Objetivo:** mostrar la metodología Thao y los últimos resultados transversales y longitudinales.

**Métodos:** estudio de cohortes longitudinal (4 años de seguimiento) y estudio transversal.

**Resultados:** el estudio longitudinal encontró un incremento del 1% en la prevalencia de exceso de peso tras 4 años de implementación del Programa Thao en 10 municipios con 6.697 niños y niñas involucrados. El estudio transversal llevado a cabo con 20.636 niños y niñas de 22 municipios encontró una prevalencia de exceso de peso infantil del 26,6%.

**Discusión:** actualmente un freno en el incremento de la prevalencia de exceso de peso infantil es considerado como un éxito debido a la alta prevalencia a nivel mundial. Son necesarios más estudios metodológicamente bien realizados para conocer la eficacia de las CBI en este campo.

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Palabras clave: *Obesidad pediátrica. Estudios de intervención. Estilo de vida. Niño.*

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## Introduction

Over the last 30 years the prevalence of non-communicable diseases has been growing in developed countries, especially concerning the quick growth in children<sup>1</sup>. The World Health Organization (WHO) estimates that in 2020 non-communicable diseases will cause 75% of the deaths in developed countries<sup>2</sup>.

Childhood obesity constitutes a huge challenge for the world public health services<sup>1,3</sup>, affecting both the quality of life and the life expectancy of the societies<sup>4</sup>. But childhood obesity not only affects developed countries but also developing countries where it is a huge concern together with malnutrition<sup>5</sup>.

In Europe the prevalence of overweight children is nearly at 20%, one third of them suffer from obesity<sup>6</sup>. This is the main reason why the Vienna statement recognises the priority of developing effective interventions throughout the member states of the European region of the WHO<sup>7</sup>.

Childhood obesity has serious short and long term consequences at short and long term<sup>8</sup>. In children and adolescents the relation between the BMI and the waist circumference with cardiovascular risk factors has been observed<sup>9</sup>. Moreover, overweight children at 8 years old have a high risk of becoming an obese adult, and 75% of children above the 70<sup>th</sup> percentile of BMI at 5 years old will be an overweight adolescent<sup>10</sup>. The maintenance of obesity from childhood to adulthood increases the risk of cardiovascular disease significantly<sup>10</sup>.

The causes of childhood obesity are multifactorial, because it has a confluence of genetic factors, lifestyles and environmental conditions, with the lifestyle being the key factor<sup>11</sup>. Even though more scientific evidence about the causes of obesity are needed<sup>12</sup>.

The effective preventive interventions of healthy lifestyles promotion to children and families are essential for slowing the growth of obesity. Due to the multifactorial and multilevel causes of obesity, a lot of countries are carrying out community based interventions (CBI). These kind of complex interventions have demonstrated encouraging results but the evidence level is still moderate<sup>13</sup>.

The evidence of the efficacy of the CBI in Europe for promoting healthy lifestyles in children and families is limited<sup>13</sup>. In France, from 1992 to 2004, the Fleurbaix Laventie Ville Santé study (FLVS) was performed, in 2 intervention towns (Fleurbaix and Laventie) and 2 control towns (Boris-Grenier and Violaines). The cross-sectional successive analysis shows a significant decrease in the prevalence of childhood obesity in the intervention towns<sup>14</sup>.

The FLVS study in 2004 motivated the EPODE (Ensemble Prévenons l'Obésité des Enfants) programme creation in France. The cross sectional analysis carried out from 2004 to 2008 also demonstrated a reduction in childhood obesity in the involved towns (Summerbell *et al.*, 2009). The EPODE

methodology is being expanded to several countries all around the world through the EPODE International Network (EIN) and is highlighting the importance of the involvement of all the local key stakeholders, especially politicians, for the expected results to be achieved<sup>15</sup>.

Thao-Child Health Programme began in Spain in 2007 based on the FLVS study and the EPODE methodology. Its CBI and the main objective is healthy lifestyle promotion to children from 0 to 12 years old and their families. In this sense promote a balanced, varied and pleasant diet, a regular physical activity, the adequate sleep duration and the determinant psychological and social factors.

In Spain the Thao Programme is aligned with the philosophy and the objectives of the NAOS strategy (Nutrition, Physical Activity and Obesity prevention Strategy), launched in 2005 by the Spanish Agency of Consumption, Food Security and Nutrition (AE-COSAN) of the Health, Social Services and Equality Ministry.

Thao Programme is implemented through the municipalities with the leadership of politicians, the coordination of a technician from the city council (Thao local coordinator) and the involvement of a multidisciplinary team (Thao local team) formed by local key stakeholders such as professional from different departments of the city council (health, education, sports, social services, libraries etc.), health care centers, sports centers, food markets and educators.

The Thao Foundation assume the central coordination of the intervention based on three areas: health promotion actions, evaluation and communication. Also coordinates the municipalities and institutional networks. The Thao Foundation is constituted by a multidisciplinary team which develop the health promotion materials and actions, the initial and periodical (each year) training of the local Thao coordinators and teams, and the permanent support to the municipalities. Also leader the annual evaluation and the common communication and media visibility. All the strategy is validated by an experts committee.

In 2007 five municipalities started the Thao Programme implementation in children from 3 to 12 years old and their families. Nowadays the Programme also purpose activities focused in children from newborns to 3 years old and it's being implemented in 70 municipalities reaching 150.000 children.

## Goals

This paper has the main goal of present the methodology of the Thao Programme and the study that shows the overweight and obesity prevalence evolution after 4 years of implementation in 10 municipalities. Moreover this paper present the results of the last cross-sectional study carried out along the 2013-2014 scholar course in 14 Thao municipalities.

## Methods

### Design

Longitudinal cohort study for the overweight and obesity prevalence evolution, 4 years of follow-up.

Cross-sectional study for the overweight and obesity prevalence the 2013-2014 scholar course.

### Study population

For the longitudinal cohort study have participated the children aged the 1st year from 3 to 7 years old and 4th year from 7 to 12 years old from the following 10 municipalities: Aranjuez, Villanueva de la Cañada, Castelldefels, Sant Carles de la Ràpita, Montgat, Balaguer, Monzón, Utrillas, Alcázar de San Juan and San Juan de Aznalfarache. It has been a convenience sampling determined by the commitment of the schools in each municipality and the agreement of each family. The final sample size is 6.697 children.

For the cross-sectional study the sample size is 20.636 children also determined by the commitment of schools and the agreement of families. Children from the following 14 municipalities of 6 autonomous spanish communities: Alcázar de San Juan, Alcobendas, Aranjuez, Villanueva de la Cañada, Badalona, Balaguer, Martorell, Montgat, Santa Bárbara, Tremp, Monzón, Utrillas, Palencia and San Juan de Aznalfarache.

### Statistical analysis

Weight status has been estimated by the BMI following the IOTF tables<sup>16</sup>.

The analysis it has been performed with the software SPSS v.19.

### Procedures

The anthropometric measurements was carried out in the schools by a trained team coordinated by the local Thao coordinator in each municipality.

### Ethics

Informed consent from families was necessary to be included in the study. Confidentiality was ensured following the currently Spanish laws. During the measurements the local Thao team took care about privacy of each children. The study protocol was approved by the ethical committee.

## Results

After 4 years of Thao Programme implementation the overweight and obesity prevalence increase a 1%, being 0,9% the increasing of the overweight and 0,1% the obesity. Specifically the prevalence of overweight (19,7%) and obesity (7,6%) on the 1st year was 27,3% and on the 4th year was 28,3% (20,6% overweight and 7,7% obesity) (see figure 1).

The last cross-sectional study carried out along the 2013-2014 scholar year, with 20636 children involved, show us a prevalence of 19,9% of overweight and 6,7% of obesity being a total of 26,6%. The stratified results by age group (see Table I) show a total prevalence of overweight of 19,6% (14,2% overweight and 5,4% obesity) in the range from 3 to 5 years old (n=5762), in the range from 6 to 9 years old (n=8828) of 29% (20,7% overweight and 8,3% obesity) and a 29,8% (24% overweight and 5,8% obesity) in the range from 10 to 12 years old (n=5096). The stratified results by sex (see figure 2) show a prevalence of total overweight of 27,8% (20,7% overweight and 7,1% obesity) in girls (n=10074) and a 25,5% (19,1% overweight and 6,4% obesity) in boys.

## Discussion

In this paper has been shown the currently cross-sectional data of overweight and obesity prevalence in children from municipalities which are implementing the Thao-Child Health Programme. Also has been shown the longitudinal data of overweight and obesity prevalence evolution after 4 years of Thao Programme implementation.

The overweight and obesity prevalence found in the Thao municipalities are similar in comparison with other representative studies carried out at Spanish national level<sup>17,18</sup>. It is a worrying prevalence because the consequence will be an increasing of morbidity and mortality in the following decades due to the overwei-

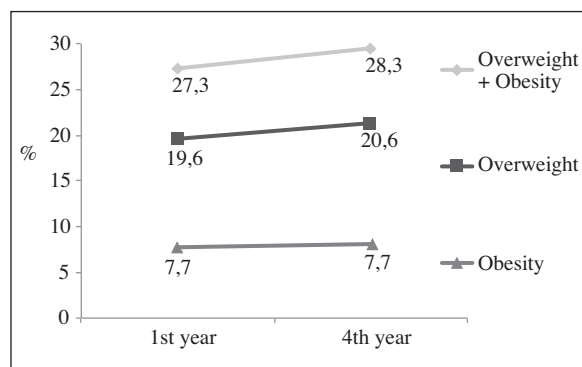


Fig. 1.—Overweight and obesity prevalence evolution at 10 Thao municipalities after 4 years of Thao-Child Health Programme Implementation.

**Table I**  
*Overweight and obesity prevalence at 14 Thao municipalities. Cross-sectional results stratified by age and sex groups*

	n	Overweight	Obesity	Overweight + Obesity
		%	%	%
Total Sample	20636	19.9	6.7	26.6
By age group				
3-5 years old	5752	14.2	5.4	19.6
6-9 years old	8828	20.7	8.3	29.0
10-12 years old	6056	24.0	5.8	29.8
By sexes				
Boys	10562	19.1	6.4	25.5
Girls	10074	20.7	7.1	27.8

ght and obesity and loss of quality of life. For this reason it is considered essential the evaluation of healthy lifestyle promotion strategies focused in the prevention of childhood obesity and other non-communicable diseases.

On the other hand the longitudinal results are encouraging because there is a stabilization of the overweight and obesity prevalence in the Thao municipalities although the children included in the study grow approximately 4 years. Nevertheless in these results can be an effect of other interventions implemented in children and families environment. The main weaknesses of the study is the methodology because hasn't been included a control group.

Anyway the objective purposed by the WHO in 2012 is to slow the increasing of childhood obesity prevalence<sup>19</sup>. Also the WHO notes that the CBI which get involvement and mobilization of all the social environment of children and families are the most effective<sup>19</sup>. However the scientific evidence about the efficacy of the CBI of healthy lifestyle promotion to children and families focused in the prevention of childhood obesity remains moderate<sup>13</sup>. This scientific evidence isn't conclusive due to the short duration of the studies or the methodology used. In France the EPODE Programme presented the comparative of the cross-sectional studies after 5 years of implementation showing also encouraging results<sup>20</sup>.

In this sense and with the objective of evaluating the efficacy of the Thao Programme it has been carried out a parallel study with 2 intervention municipalities and 2 control municipalities evaluating in both several variables<sup>21</sup>. The results will be published and can be an important reference about the efficacy of the CBI in our environment.

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