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**Compliance evaluation of the self-regulation agreement of food and drink vending machines sector regarding primary schools in Madrid, Spain, in 2008.**

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**Authors Contribution**

Miguel Á Royo-Bordonada designed the study and María Á. Martínez-Huedo collected the data. Both authors were involved in data analysis and interpretation, writing the paper and had final approval of the submitted and published versions.

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**Conflicts of Interest**

No conflict of interest declared by the authors.

**Compliance evaluation of the self-regulation agreement of food and drink vending machines sector regarding primary schools in Madrid, Spain, in 2008.**

**Abstract**

*Objectives:* To evaluate the compliance of the self-regulation agreement of food and drink vending machines sector regarding primary schools in Madrid.

*Methods:* Cross-sectional study of the prevalence of vending machines in 558 primary schools in 2008. From the directory of all registered primary schools in Madrid, we found out the presence of machines by telephone interviews and evaluated the agreement's compliance by visiting the schools, regarding accessibility, type of publicity, products offered and knowledge of the agreement.

*Results:* The prevalence of schools with vending machines was 5.8%. None of the schools reported knowing neither the agreement nor its nutritional guidelines, and most machines were accessible to primary school students (79.3%) and packed with high-calorie, low-nutrient-dense foods (58.6%).

*Conclusions:* We found a low compliance of the commitments included in the self-regulation agreement of the vending machines sector. Stricter regulation should receive priority in the battle against the obesity epidemic.

**Keywords:** Children; primary school; vending machines; self-regulation; obesity; food industry.

**Evaluación del cumplimiento del convenio de autorregulación del sector de máquinas expendedoras de alimentos y bebidas en las escuelas de primaria de Madrid, España, en 2008.**

**Resumen**

*Objetivos:* Evaluar el cumplimiento del convenio de autorregulación del sector de máquinas expendedoras de alimentos y bebidas en las escuelas de primaria de Madrid.

*Métodos:* Estudio de prevalencia de máquinas expendedoras en las 558 escuelas de primaria de Madrid en 2008. A partir del directorio de colegios registrados, se detectó la existencia de máquina mediante entrevista telefónica. El conocimiento y cumplimiento del acuerdo se evaluó mediante inspección in situ de las máquinas (accesibilidad, tipo de publicidad, productos ofertados).

*Resultados:* La prevalencia de colegios con máquina fue del 5,8%. Ninguna escuela conocía el convenio. La mayoría de máquinas eran accesibles a estudiantes de primaria (79,3%) y contenían mayoritariamente productos altamente energéticos y bajos en nutrientes (58,6%).

*Conclusiones:* Observamos un bajo cumplimiento de los acuerdos del convenio. En la batalla contra la epidemia de la obesidad, debería priorizarse una regulación más estricta de la industria alimentaria.

**Palabras clave:** Infancia; escuela primaria; máquinas expendedoras; autorregulación; obesidad; industria alimentaria.

## Introduction

By the start of the 21st Century, one of every three Spanish children were overweight or obese, a three-fold increase in just two decades<sup>1</sup>. In Madrid, the prevalence of overweight plus obesity among population 2 to 24 years old was 27,5% in year 2000<sup>2</sup>. To stop this harmful trend, in 2005 the Spanish government launched the National Strategy for Control of Obesity (NAOS-Nutrición, Actividad, Obesidad y Salud)<sup>3</sup>. The NAOS Strategy aims to encourage a healthy diet and regular physical activity through interventions in school-, healthcare-, industry-, family-, and community-settings, with special emphasis on children. At the industry level, the Ministry of Health and Consumer Affairs (MSC for its acronym in Spanish) signed six agreements of voluntary collaboration with the private sector during the very first year of the Strategy, a strong show of support for a self-regulating food and marketing industry<sup>3</sup>.

As the soft-drink industry has drawn on schools to encourage soda consumption among children, governments around the world are taking action to limit the availability of soft drinks in schools<sup>4</sup>. This action is particularly relevant taking into account that in countries where vending machines are frequently placed in schools 20% of children drink more than 4 soda drinks a day<sup>5</sup>.

Along these lines, MSC established a collaborative agreement with the National Association of Vending Machines of Spain (ANEDA for its acronym in Spanish) in which the association made the following commitments<sup>6</sup>:

- No placement of food and soda vending machines in areas of easy access to primary school students.
- Inclusion of products contributing to a balanced diet, at the expense of those with high salt-, sugar-, and/or fat-content.
- Replacement of food adverts with messages promoting healthy eating habits.
- Collaboration in children's nutritional education by creating and disseminating the "Guidelines for an adequate nutrition in learning centers through vending machines".

The aim of this study was to evaluate the compliance of the self-regulation agreement of food and drink vending machines sector regarding primary schools in Madrid.

## **Methods**

It was a cross-sectional study of all registered primary schools -public, private and partially state-funded- in the directory of Madrid, based on data obtained from January to May of 2008. Public primary schools differed from private ones in that students of secondary level are housed in a different building, whereas in private and partially state-funded schools they are in the same one, but in separate yards. Through a telephone interview, we asked about the presence of vending machines at schools. The rest of the information, including the degree of accessibility to the machines by primary school students, products offered, adverts or health-promotion messages, and the degree of knowledge regarding the agreement and the nutritional guidelines, was collected during visits to all schools reporting having vending machines by means of visual inspection of the machine(s) and in-person interview with the school's headmaster or the person in charge of the nutritional planning. The type of products classified as healthy were water, milk or yogurt, for drinks, and sandwiches, cereal or fruit, for foods. We calculated the number of machines offering some healthy product -food or drink- and the number whose healthy foods and drinks represented more than 10% of the products offered.

To address the agreement's potential impact on vending machines' presence, we administered a telephone survey to a random sample of 70 schools, stratified by source of funding (public vs. private), who reported no vending machines in 2008. The non-structured survey collected data on vending machine presence before the agreement was established, and reasons for vending machine removal.

We used STATA statistical software package to run frequencies on the variables of interest. Percentages of vending machines by type of school were compared using Chi-square test.

## **Results**

At the time of the study there were 558 primary schools in Madrid: 236 (42.3%) public, 55 (9.9%) private, and 267 (47.8%) partially state-funded private schools. At the initial telephone interview four partially state-funded private schools failed to respond whether or not there were vending machines in their premises. Thus, the final sample consisted of 554 schools of which 32 (5.8%) had machines (Table 1). Private schools and partially state-funded private

schools (12.7% and 9.4% respectively) were more likely to report having machines than public schools (0%) ( $p < 0.01$ ).

We were unable to perform the in-person machine inspection or the personal interview to collect data on compliance with the agreement for three schools. Of the remaining 29 schools none knew of the agreement between MSC and ANEDA or about the “Guidelines for an adequate nutrition in learning centers through vending machines.” A total of 23 machines (79.3%) were fully accessible to primary school students (playground, hallways, and lobbies), 11 machines (37.9%) had food advertising on the outside, and none had healthy eating habit messages. Twenty two machines (75.9%) offered some healthy alternative, but 17 (58.6%) didn’t offered a healthy product or healthy choices did not exceed 10% of the products sold, leaving the remaining selections to be all high in salt, sugar, and/or fat (Table 1).

From the subsample of 70 schools with no vending machines at the time of the study, 6 (8.6% 95%CI 1,3%-15,8%), all private whether partially state-funded or not, reported having had machines before the agreement. Again, none of them knew of the agreement. In two cases, machines were removed due to the perception that they encouraged unhealthy eating habits. The other four schools removed them due to low profitability.

## **Discussion**

We found a low prevalence of vending machines in Madrid’s primary schools. In fact, none of the schools having machines reported knowing the agreement or the nutritional guidelines resulting from the agreement. All the schools with machines were private and offered both primary and secondary level education. Most of these machines did not comply with the agreement regulations regarding its location, the messages posted on them, or the nutritional value of the choices offered.

At the international level, the observed trend in primary schools is also towards lower prevalence of vending machines but they are still disproportionately packed with mostly high-calorie, low-nutrient-dense foods<sup>7</sup>. Consumption of these foods, and soft drinks particularly, increase obesity risk from early childhood<sup>8</sup>. In Madrid, one of every three public secondary schools have vending machine<sup>9</sup>, drawing the attention to the fact that secondary schools weren’t considered in the agreement between MSC and ADENA. The separation between primary and secondary school in the Spanish public school system offers certain protection to the youngest, but leaves the door open for vending machines packaged with products high in



salt, sugar, and/or fat to continue being available at public secondary schools. As consumption of sugary drinks is associated with increased availability of vending machines in schools<sup>5</sup> and replacement of sugar-containing beverages with healthier drinks has shown to reduce weight gain and fat accumulation in normal-weight children<sup>10</sup>, the prohibition of packaging vending machines with high-calorie, low-nutrient dense processed foods, both in primary and secondary schools, could make a significant contribution to the control of the obesity problem among scholars in Madrid.

Due to the substantially higher profits yielded by selling high-calorie, low-nutrient dense processed foods than fresh products, the incompatibility between food industry and public health interests is visibly obvious<sup>11</sup>. Not surprisingly then, food industry's tactics to influence regulatory mechanisms, e.g., strongly opposing governmental regulation and promoting instead self-regulation through voluntary agreements, mirror those previously used by the tobacco and alcohol industries, which proved ineffective and harmful for the public's health<sup>12-14</sup>. Similarly, self-regulation of food advertising targeting children has shown to be ineffective at national<sup>15</sup> and international level<sup>16</sup>. The observed futility of self-regulation of vending machines provides further evidence that food industry's staunch defense of self-regulation, far from providing value to public health, is a strategy to avoid stricter regulation. The recent recommendations of the Health Ministry and Health Regional Authorities for food in schools seem clearly insufficient<sup>17</sup>. Unlike the School Food Standards Regulation, that applies to all food and drink provided by schools in the UK<sup>18</sup>, their nutritional criteria for vending machines products are not in line with WHO nutritional recommendations ("to avoid school stockouts", they declare) and compliance remains voluntary.

Our study included all schools -public, private and partially state-funded- of Madrid City with vending machine, and a random sample of schools without machine. Other strengths include the capacity to contact the headmaster or the person with knowledge of this subject and being able to visit the schools with vending machine. However, the sample of schools used to estimate the presence of vending machines before the agreement was limited in size and the survey regarding the reasons to remove the machines was a non-structured one, so these results must be taken with caution.

To help in the battle against the obesity epidemic, we recommend governmental regulations to require all food and drink products offered in schools meeting healthy nutritional criteria, according to current national and international evidence based nutritional recommendations.

**What is known about the subject?**

Self-regulation through of tobacco and alcohol industries and food advertising targeting children has proved ineffective and harmful for the public's health.

**What does this study add to the literature?**

The low prevalence of vending machines found in Madrid's primary schools was not due to the agreement between ANEDA and the MSC. None of the schools having machines reported knowing of the said agreement, and most machines didn't comply its regulations.

Governmental regulation is required in Spain to guarantee the nutritional quality of food and drinks offered in schools and stop primary school students having access to vending machines.

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