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DE MÉXICO

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ORIGINAL ARTICLE

## Prevalence of functional gastrointestinal disorders in school-aged children in El Salvador<sup>☆</sup>



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Received 21 January 2015; accepted 26 March 2015

Available online 11 September 2015

### KEYWORDS

Epidemiology;  
Functional  
gastrointestinal  
disorders;  
Nausea;  
Functional  
constipation;  
Irritable bowel  
syndrome

### Abstract

**Background:** We studied the epidemiology of functional gastrointestinal disorders (FGIDs) in school-aged Salvadoran children using standardized diagnostic criteria.

**Aims:** To determine the prevalence of FGIDs in school-aged children in El Salvador.

**Material and methods:** A total of 395 children participated in the study (one public school and one private school). School children completed the Spanish version of the Questionnaire on Pediatric Gastrointestinal Symptoms–Rome III (QPGS-III), an age-appropriate and previously validated instrument for diagnosing FGIDs according to the Rome III criteria. Sociodemographic (age, sex, type of school) and familial (family structure and size, family history of gastrointestinal disorders) data were obtained.

**Results:** The mean age of the sample was 11.8 years  $\pm$  1.6 SD (median 10, range 8–15) and 59% of the participants were female. Eighty-one children met the diagnostic criteria for a FGID (20%). Defecation disorders were the most common group of FGIDs. Functional constipation was diagnosed in 10% of the children and 9.25% were diagnosed with abdominal pain-related FGIDs (most commonly IBS, 3.75%). IBS overlapped with functional dyspepsia in 11% of the cases. Children with FGIDs frequently reported nausea. Children attending private school and older children had significantly more FGIDs than children in public school and younger children.

**Conclusions:** FGIDs are common in school-aged Salvadoran children.

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<sup>☆</sup> Please cite this article as: Zablach R, Velasco-Benítez CA, Merlos I, Bonilla S, Saps M. Prevalencia de trastornos funcionales gastrointestinales en niños en edad escolar en El Salvador. Revista de Gastroenterología de México. 2015;80:186–191.

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**PALABRAS CLAVE**

Epidemiología;  
Trastornos  
funcionales  
gastrointestinales;  
Náuseas;  
Estreñimiento;  
Síndrome de intestino  
irritable

**Prevalencia de trastornos funcionales gastrointestinales en niños en edad escolar en El Salvador****Resumen**

*Antecedentes:* La epidemiología de los trastornos funcionales gastrointestinales en niños salvadoreños en edad escolar usando criterios diagnósticos estandarizados no se ha estudiado.

*Objetivos:* Determinar la prevalencia de trastornos funcionales gastrointestinales en niños salvadoreños en edad escolar.

*Materiales y métodos:* Trescientos noventa y cinco niños participaron en el estudio (una escuela pública y una privada). Se utilizó el Questionnaire on Pediatric Gastrointestinal Symptoms-Rome III (QPGS-III) traducido al español, que es un instrumento apropiado para el uso en este grupo de edad y que ha sido validado. Se recolectó información acerca de variables socio-demográficas (edad, sexo, tipo de escuela) y familiares (tamaño y estructura familiar, historia familiar de trastornos funcionales gastrointestinales).

*Resultados:* La edad promedio fue 11.8 años  $\pm$  1.6 SD (media 10, rango 8-15), y el 59% fueron mujeres. Ochenta y un niños cumplieron criterios diagnósticos de trastorno gastrointestinales funcionales (20%). El estreñimiento fue el diagnóstico más frecuente y fue diagnosticado en 10% de niños. El 9.25% de los niños fueron diagnosticados con trastornos funcionales gastrointestinales asociados a dolor abdominal (el más común fue síndrome de intestino irritable, 3.75%). Hubo sobreposición de diagnóstico entre síndrome de intestino irritable y dispepsia funcional en 11% de los casos. Los niños con trastornos funcionales gastrointestinales reportaron mayor porcentaje de náusea. Los niños en escuelas privadas y niños mayores de 12 años demostraron mayor porcentaje de trastornos funcionales gastrointestinales que niños en escuelas públicas y niños menores de 12 años.

*Conclusiones:* Los trastornos funcionales gastrointestinales son comunes en niños salvadoreños en edad escolar.

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**Introduction**

Functional gastrointestinal disorders (FGIDs) are among the most common problems in children and adults. FGIDs are a worldwide problem. Studies from the US,<sup>1-4</sup> Germany,<sup>5</sup> China,<sup>6</sup> and Colombia<sup>7</sup> have found a high prevalence of FGIDs in school-aged children. Children with FGIDs have a poor quality of life and higher levels of anxiety and depression.<sup>8</sup> FGIDs in children have long-lasting effects with a high proportion of children continuing to complain of gastrointestinal and psychological disturbances as adults.<sup>9,10</sup>

The pathogenesis of FGIDs is not yet fully understood. It has been proposed that FGIDs are a result of the interplay of multiple factors including genetics, the microbiome, and environmental and psychosocial elements. Irritable Bowel Syndrome (IBS) is one of the common FGIDs, and its definition includes changes in stool consistency, as well as the symptoms of chronic intermittent abdominal pain. A meta-analysis has shown an increased risk of IBS in Asian patients thought to be associated with the presence of specific genetic mutations.<sup>11</sup> Recent studies have measured cytokines in adults and children with IBS in Mexico.<sup>12</sup> It is still unclear whether cytokines and genetic variations could explain the differences in prevalence of FGIDs among regions. Identifying the relative influence of each of these factors would help advance the understanding of the pathogenesis and pathophysiology of FGIDs.

Epidemiological studies using validated diagnostic instruments and common methods make comparisons among regions possible. The comparative analysis of regional differences in prevalence and the infectious, social, environmental, dietary, and cultural characteristics of each region provides a unique opportunity to study the relative influence of each of the factors involved in the biopsychosocial model. Epidemiological studies are of utmost importance for public healthcare planning. Regional prevalence studies are an aid to efficient healthcare planning by allowing a targeted use of scarce healthcare resources. A better understanding of the various factors that predispose children to develop FGIDs could also lead to a novel approach to this public health problem in the form of primary and secondary prevention. Establishing early preventive measures could result in a shift in the current paradigm of FGID care with potential implications for children and adults.

In the past, we have translated and validated the Questionnaire of Pediatric Gastrointestinal Symptoms (QPGS) into Spanish<sup>13</sup> and conducted epidemiological studies on school children in the US<sup>3</sup> and South America,<sup>7</sup> using a common methodology. To the best of our knowledge, this is the first study to be published on the epidemiology of FGIDs in school children in Central America.

The main aim of this study was to determine the prevalence of FGIDs in school-aged children in El Salvador.

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