

## 上海市长宁区学龄儿童消化不良症状发生情况 及其与膳食模式的关联研究

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**【摘要】** 为调查上海市长宁区学龄儿童消化不良症状的发生情况,研究膳食模式对其影响,于2019年9月采用整群抽样方法从长宁区5所小学选择304名7~11岁健康儿童,使用问卷调查基本信息、生活习惯、食物消费情况和消化不良症状的发生情况。采用因子分析提取膳食模式,通过Logistic回归分析膳食模式与学龄儿童消化不良症状的关系。半年内腹痛、腹泻、便秘和口臭分别占42.4%(123/290)、48.3%(140/290)、39.1%(115/294)和50.7%(148/292)。年龄大、男孩、母亲超重或肥胖、吸烟和饮水量低可能是消化不良症状的危险因素,父母高学历可能是消化不良症状的保护因素。处于海产品膳食模式高分组的儿童半年内腹泻(OR=1.87,95%CI:1.10~3.20)和便秘(OR=1.80,95%CI:1.06~3.06)发生率较高。处于奶制品膳食模式高分组的儿童半年内腹痛(OR=0.54,95%CI:0.32~0.91)和腹泻(OR=0.51,95%CI:0.30~0.87)发生率较低。处于传统膳食模式高分组的儿童半年内腹泻(OR=0.51,95%CI:0.30~0.87)发生率较低。处于高热量膳食模式高分组的儿童半年内腹痛(OR=1.78,95%CI:1.06~2.99)和口臭(OR=1.86,95%CI:1.11~3.12)发生率较高。上海市长宁区学龄儿童消化不良症状发生情况较高,膳食模式可能影响学龄儿童消化不良症状的发生。

**【关键词】** 学龄儿童; 消化不良; 膳食模式

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## Investigation of dyspepsia in school-age children in Changning District of Shanghai, China and its association with dietary patterns

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**【Abstract】** To investigate the incidence of dyspepsia in school-age children in Changning District of Shanghai and to study the effect of dietary patterns on it, a total of 304 healthy children aged 7~11 years were selected from 5 primary schools in Changning District in Sep 2019. The basic information, living habits, food consumption and the incidence of dyspeptic symptoms were investigated by questionnaire. Factor analysis was used to extract dietary patterns, and Logistic regression was used to analyze the relationship between dietary patterns and dyspeptic symptoms of school-age children. The number of people with abdominal pain, diarrhea, constipation and bad breath within half a year accounted for 42.4% (123/290), 48.3% (140/290), 39.1% (115/294) and 50.7% (148/292), respectively. Increasing age, boys,

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overweight or obese mothers, smoking and low water intake may be risk factors for dyspeptic symptoms, and a high degree of parental education may be a protective factor for dyspeptic symptoms. Children in the high group of seafood dietary pattern had an increased incidence of diarrhea (OR=1.87, 95%CI: 1.10–3.20) and constipation within half a year (OR=1.80, 95%CI: 1.06–3.06). Children in the high group of dairy dietary pattern had a lower incidence of abdominal pain (OR=0.54, 95%CI: 0.32–0.91) and diarrhea (OR=0.51, 95%CI: 0.30–0.87) within half a year. Children in the high group of traditional diet pattern had a lower incidence of diarrhea within half a year (OR=0.51, 95%CI: 0.30–0.87). Children in the high-calorie dietary group had an increased incidence of abdominal pain (OR=1.78, 95%CI: 1.06–2.99) and bad breath (OR=1.86, 95%CI: 1.11–3.12) within half a year. School-age children in Changning District of Shanghai have a higher incidence of dyspeptic symptoms, and dietary patterns may affect the occurrence of dyspeptic symptoms in school-age children.

**【Key words】** school-age children; dyspepsia; dietary patterns

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消化不良是临床上常见的消化系统症状,主要包括腹痛、腹泻、便秘及口臭等。膳食构成与消化不良症状关系密切,甚至可能为其危险因素。不良消化道症状持续发展可能会进一步演变为肠道疾病,影响患者的生活质量,并带来高额的经济负担。膳食模式作为一种饮食模式,是由多种食物组合而形成的,反映人们日常生活中食物消费习惯,较单一的食物消费情况能更全面系统地反映食物摄入总体状况,更具疾病预测意义和价值。目前我国尚未见膳食模式与消化不良症状的研究报道。本研究探讨学龄儿童消化不良症状与膳食模式之间的关系,以期预防消化道相关疾病和提高儿童身体素质提供理论依据。

#### 资料和方法

**研究对象** 2019年9月,将上海市长宁区按照地理位置分为东西南北中5个区域,从每个区域随机选择1所学校,从2~5年级按年级分层整群抽取1个班级,共计304人。监护人签署知情同意后儿童正式进入本研究。由于其中5人未提供尿样,最终纳入299名学龄儿童,年龄7~11岁,平均8.8岁,148名男生(49.5%),151名女生(50.5%)。

**问卷调查** 填写问卷前由学校老师统一给监护人培训,问卷由监护人填写。调查内容包括基本信息、运动情况、饮水情况和食物消费等信息。基本信息包括性别、出生日期、家庭收入状况、父母健康状况、是否为母乳喂养等;运动情况包括参加体育运动的时间、日常使用电子设备的时间;饮水情

况包括家庭饮水的方式和日常饮水量;采用食物频率问卷法调查食物消费情况,包括米饭、杂粮、谷薯类等17个类别。每个类别根据食物食用频次再进行细分,包括每天食用3次及以上、每天食用1~2次、每周食用4~6天、每周食用1~3天、很少或不食用。

儿童身高和体重由专业人员按照标准方法测量。采用直立式身高计测量身高,精确到0.1 cm。采用电子体重计称量体重,精确到0.01 kg。

采用问卷调查学龄儿童在半年内腹痛、腹泻、口臭和便秘的发生情况,发生频率分为:从不发生、偶尔发生、经常发生和不清楚(表1)。

**统计学分析** 使用EpiData3.0软件录入问卷信息,使用SPSS 22.0进行数据分析。根据2003年制定的中国学龄儿童青少年体重指数(body mass index, BMI)的超重、肥胖筛查分类标准<sup>[1]</sup>来判断学龄儿童是否肥胖或超重。将消化不良症状发生频率中的从不发生归为无症状,将偶尔发生和经常发生归为有症状,未报告和不清楚不纳入统计分析。采用 $\chi^2$ 检验分析儿童基本信息、运动情况、饮水情况和食物消费等信息与消化不良症状的关系。采用因子分析对问卷收集到的17种食物消费情况提取膳食模式。根据因子得分是否大于均数,将膳食模式类型进行二分类转换,分别设定为低分组和高分组。采用二分类Logistic回归分析膳食模型与消化不良症状的关系。

#### 结果

**消化不良症状发生情况** 学龄儿童半年内消

化不良症状的人数具体分布见表1。将偶尔发生和经常发生合并后,半年内腹痛、腹泻、便秘和口臭分

别占42.4%(123/290)、48.3%(140/290)、39.1%(115/294)和50.7%(148/292)。

表1 学龄儿童半年内消化不良症状发生情况表  
Tab 1 Prevalence of dyspeptic symptoms in school-age children [n(%)]

| Dyspeptic symptoms (n=299) | Abdominal pain | Diarrhea   | Constipation | Bad breath |
|----------------------------|----------------|------------|--------------|------------|
| Not reported               | 2 (0.7)        | 4 (1.3)    | 2 (0.7)      | 3 (1.0)    |
| Unclear                    | 7 (2.3)        | 5 (1.7)    | 3 (1.0)      | 4 (1.3)    |
| Never                      | 167 (55.9)     | 150 (50.2) | 179 (59.9)   | 144 (48.2) |
| Occasionally               | 115 (38.5)     | 139 (46.5) | 106 (35.5)   | 134 (44.8) |
| Often                      | 8 (2.7)        | 1 (0.3)    | 9 (3.0)      | 14 (4.7)   |

因子分析 对学龄儿童食物摄入频率(food frequency questionnaire, FFQ)中的17种食物的摄入频次进行因子分析, KMO(Kaiser-Meyer-Oklin)统计量为0.777, Bardett's 检验 $P<0.01$ 。特征根 $>1$ 的因子共6个, 累计贡献率达61.28%。依据因子分析, 提取6种膳食模式: 海产品膳食模式(以虾蟹类、海水鱼和淡水鱼为主)、杂粮豆类膳食模式(以杂粮、豆制品和坚果为主)、奶制品膳食模式(以鲜奶和酸奶为主)、传统膳食模式(以米饭、新鲜蔬菜和水果为主)、禽畜肉膳食模式(以禽肉和畜肉为主)

和高热量膳食模式(以糖果、糕点和巧克力为主)。

人口学特征与消化不良症状的关联分析 采用 $\chi^2$ 检验分析一般人口学特征与消化道症状, 发现年龄较大的儿童半年内腹泻发生率增高, 男孩半年内腹泻发生率高于女孩, 父母高学历的儿童半年内口臭发生率降低, 母亲超重或肥胖的儿童半年内腹痛和腹泻发生率增高, 家中父母吸烟的儿童半年内腹泻发生率增高, 饮水量较多的儿童口臭发生率降低(表2)。

表2 学龄儿童一般人口学特征与消化不良症状的单因素分析

Tab 2 Univariate analysis of general demographic characteristics and dyspeptic symptomswithin half a year in school-age children [n(%)]

| Variable (n=299)        | Case <sup>a</sup> | Abdominal pain <sup>b</sup> | Diarrhea <sup>b</sup> | Constipation <sup>b</sup> | Bad breath <sup>b</sup> |
|-------------------------|-------------------|-----------------------------|-----------------------|---------------------------|-------------------------|
| Age (y)                 | 297 (99.3)        |                             |                       |                           |                         |
| ≤9                      | 214 (72.1)        | 83 (40.1)                   | 91 (44.0)             | 85 (40.3)                 | 112 (53.3)              |
| >9                      | 83 (27.9)         | 38 (46.9)                   | 48 (59.3)             | 29 (35.8)                 | 34 (42.5)               |
| P                       |                   | 0.292                       | 0.019                 | 0.482                     | 0.099                   |
| Sex                     | 299 (100)         |                             |                       |                           |                         |
| Male                    | 148 (49.5)        | 67 (47.2)                   | 78 (55.3)             | 50 (34.7)                 | 72 (50.3)               |
| Female                  | 151 (50.5)        | 56 (37.8)                   | 62 (41.6)             | 65 (43.3)                 | 76 (51.0)               |
| P                       |                   | 0.107                       | 0.020                 | 0.130                     | 0.911                   |
| Delivery mode           | 295 (98.7)        |                             |                       |                           |                         |
| Spontaneous delivery    | 148 (50.2)        | 61 (43.0)                   | 62 (44.3)             | 60 (41.4)                 | 80 (55.6)               |
| Cesarean section        | 147 (49.8)        | 60 (41.4)                   | 76 (52.1)             | 53 (36.3)                 | 65 (45.1)               |
| P                       |                   | 0.787                       | 0.189                 | 0.374                     | 0.077                   |
| Father's education      | 294 (98.3)        |                             |                       |                           |                         |
| Below undergraduate     | 143 (48.6)        | 56 (40.3)                   | 68 (48.6)             | 56 (39.2)                 | 82 (57.7)               |
| Undergraduate and above | 151 (51.4)        | 67 ( 45.9)                  | 70 (48.3)             | 55 (37.7)                 | 64 (44.1)               |
| P                       |                   | 0.340                       | 0.960                 | 0.795                     | 0.021                   |
| Mother's education      | 295 (98.7)        |                             |                       |                           |                         |
| Below undergraduate     | 144 (48.8)        | 57 (40.7)                   | 70 (50.4)             | 56 (39.4)                 | 82 (57.7)               |
| Undergraduate and above | 151 (51.2)        | 66 (44.9)                   | 69 (46.9)             | 55 (37.2)                 | 65 (44.5)               |
| P                       |                   | 0.474                       | 0.563                 | 0.690                     | 0.025                   |
| Father's BMI            | 284 (95.0)        |                             |                       |                           |                         |

(续表2)

| Variable ( <i>n</i> =299)       | Case <sup>a</sup> | Abdominal pain <sup>b</sup> | Diarrhea <sup>b</sup> | Constipation <sup>b</sup> | Bad breath <sup>b</sup> |
|---------------------------------|-------------------|-----------------------------|-----------------------|---------------------------|-------------------------|
| Normal                          | 136 (47.9)        | 51 (38.3)                   | 58 (43.0)             | 55 (41.0)                 | 67 (50.8)               |
| Overweight or obese             | 148 (52.1)        | 66 (46.5)                   | 74 (52.9)             | 50 (34.5)                 | 74 (51.0)               |
| <i>P</i>                        |                   | 0.173                       | 0.101                 | 0.258                     | 0.963                   |
| Mather's BMI                    | 287 (96.0)        |                             |                       |                           |                         |
| Normal                          | 241 (84.0)        | 93 (39.7)                   | 105 (45.1)            | 87 (36.7)                 | 114 (48.7)              |
| Overweight or obese             | 46 (16.0)         | 25 (55.6)                   | 29 (64.4)             | 19 (41.3)                 | 26 (56.5)               |
| <i>P</i>                        |                   | 0.049                       | 0.017                 | 0.556                     | 0.333                   |
| Family's incom (yuan/y)         | 254 (84.9)        |                             |                       |                           |                         |
| <100 000                        | 70 (27.6)         | 25 (38.5)                   | 28 (42.4)             | 25 (36.2)                 | 36 (52.9)               |
| 100 000–200 000                 | 39 (15.4)         | 17 (43.6)                   | 22 (56.4)             | 13 (33.3)                 | 20 (51.3)               |
| >200 000                        | 145 (57.1)        | 60 (42.3)                   | 64 (45.7)             | 57 (40.1)                 | 66 (47.1)               |
| <i>P</i>                        |                   | 0.839                       | 0.365                 | 0.695                     | 0.711                   |
| Type of drinking water          | 299 (100)         |                             |                       |                           |                         |
| Non tap water                   | 58 (19.4)         | 23 (41.1)                   | 22 (40.0)             | 26 (45.6)                 | 26 (45.6)               |
| Tap water                       | 241 (80.6)        | 100 (42.7)                  | 118 (50.2)            | 89 (37.6)                 | 122 (51.6)              |
| <i>P</i>                        |                   | 0.821                       | 0.172                 | 0.263                     | 0.393                   |
| Water consumption (mL)          | 294 (98.3)        |                             |                       |                           |                         |
| <1 000                          | 241 (82.0)        | 98 (42.1)                   | 111 (47.4)            | 96 (40.2)                 | 128 (54.5)              |
| ≥1 000                          | 53 (18.0)         | 24 (46.2)                   | 27 (52.9)             | 17 (34.0)                 | 20 (38.5)               |
| <i>P</i>                        |                   | 0.590                       | 0.476                 | 0.416                     | 0.037                   |
| Screen time on weekdays (min/d) | 296 (99.0)        |                             |                       |                           |                         |
| <30                             | 162 (54.7)        | 65 (41.1)                   | 69 (44.2)             | 57 (36.1)                 | 77 (48.4)               |
| ≥30                             | 134 (45.3)        | 57 (44.2)                   | 68 (51.9)             | 55 (41.4)                 | 70 (53.8)               |
| <i>P</i>                        |                   | 0.603                       | 0.195                 | 0.357                     | 0.359                   |
| Screen time on weekends (min/d) | 297 (99.3)        |                             |                       |                           |                         |
| <30                             | 43 (14.5)         | 14 (34.1)                   | 18 (46.2)             | 13 (33.3)                 | 17 (42.5)               |
| ≥30                             | 254 (85.5)        | 108 (43.7)                  | 120 (48.2)            | 100 (39.5)                | 131 (52.4)              |
| <i>P</i>                        |                   | 0.250                       | 0.813                 | 0.460                     | 0.245                   |
| Physical exercise (min/d)       | 294 (98.3)        |                             |                       |                           |                         |
| <30                             | 50 (17.0)         | 23 (48.9)                   | 25 (53.2)             | 19 (38.0)                 | 30 (60.0)               |
| 30–60                           | 138 (46.9)        | 58 (43.33)                  | 64 (47.4)             | 57 (42.2)                 | 66 (49.3)               |
| ≥60                             | 106 (36.1)        | 40 (38.5)                   | 48 (46.6)             | 35 (33.7)                 | 51 (49.5)               |
| <i>P</i>                        |                   | 0.467                       | 0.738                 | 0.401                     | 0.393                   |
| Children BMI                    | 296 (99.0)        |                             |                       |                           |                         |
| Normal                          | 201 (67.9)        | 81 (41.3)                   | 90 (46.2)             | 83 (42.1)                 | 99 (50.3)               |
| Overweight                      | 42 (14.2)         | 22 (55.0)                   | 23 (59.0)             | 16 (39.0)                 | 23 (57.5)               |
| Obese                           | 53 (17.9)         | 18 (35.3)                   | 26 (49.1)             | 15 (28.3)                 | 23 (44.2)               |
| <i>P</i>                        |                   | 0.154                       | 0.341                 | 0.187                     | 0.451                   |
| Family smoking status           | 292 (97.7)        |                             |                       |                           |                         |
| Now                             | 129 (43.1)        | 53 (42.4)                   | 62 (50.0)             | 50 (39.1)                 | 57 (45.2)               |
| Once                            | 36 (12.0)         | 18 (51.4)                   | 23 (67.6)             | 13 (38.2)                 | 21 (60.0)               |
| Never                           | 127 (42.5)        | 49 (39.5)                   | 54 (23.2)             | 47 (37.6)                 | 68 (54.8)               |
| <i>P</i>                        |                   | 0.452                       | 0.040                 | 0.972                     | 0.171                   |

<sup>a</sup> Number of children who completed the corresponding item of questionnaire survey (percent proportion in all); <sup>b</sup> Number of children who completed the corresponding item of questionnaire survey by variable (percent proportion in each group).

膳食模式与消化不良症状的关联分析 分别对二分类处理后的膳食模式与消化不良症状做 Logistic 回归分析(表3)。结果显示,海产品膳食模式与半年内腹泻和便秘呈正相关,奶制品膳食模式与半年内腹痛和腹泻呈负相关,传统膳食模式与半年内腹泻呈负相关,高热量膳食模式与半年内口臭呈正相关。校正混杂因素后,多因素 Logistics 回归分析发现高热量膳食模式与半年内腹痛呈正相关。

表 3 基于因子得分的学龄儿童膳食模式与半年内消化不良症状的 Logistic 回归分析

Tab 3 Logistic regression analysis of dietary patterns based on factor score and dyspeptic symptoms within half a year in school-age children

| Dietary pattern               | Abdominal pain      |                             | Diarrhea            |                             | Constipation        |                             | Bad breath          |                             |
|-------------------------------|---------------------|-----------------------------|---------------------|-----------------------------|---------------------|-----------------------------|---------------------|-----------------------------|
|                               | Crude model         | Adjusted model <sup>a</sup> | Crude model         | Adjusted model <sup>b</sup> | Crude model         | Adjusted model <sup>c</sup> | Crude model         | Adjusted model <sup>d</sup> |
| Seafood                       |                     |                             |                     |                             |                     |                             |                     |                             |
| Low score group               | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           |
| High score group <sup>e</sup> | 1.20<br>(0.73-1.96) | 1.25<br>(0.75-2.10)         | 1.67<br>(1.02-2.75) | 1.87<br>(1.10-3.20)         | 1.68<br>(1.01-2.78) | 1.80<br>(1.06-3.06)         | 1.53<br>(0.94-2.48) | 1.45<br>(0.88-2.40)         |
| Coarse cereals and beans      |                     |                             |                     |                             |                     |                             |                     |                             |
| Low score group               | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           |
| High score group <sup>e</sup> | 1.23<br>(0.75-2.01) | 1.19<br>(0.71-1.99)         | 1.08<br>(0.66-1.77) | 1.02<br>(0.60-1.72)         | 0.92<br>(0.56-1.53) | 0.89<br>(0.52-1.51)         | 0.84<br>(0.52-1.38) | 0.85<br>(0.52-1.43)         |
| Dairy                         |                     |                             |                     |                             |                     |                             |                     |                             |
| Low score group               | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           |
| High score group <sup>e</sup> | 0.53<br>(0.32-0.87) | 0.54<br>(0.32-0.91)         | 0.52<br>(0.32-0.85) | 0.51<br>(0.30-0.87)         | 0.71<br>(0.43-1.17) | 0.76<br>(0.45-1.28)         | 0.67<br>(0.41-1.09) | 0.64<br>(0.38-1.06)         |
| Traditional diet              |                     |                             |                     |                             |                     |                             |                     |                             |
| Low score group               | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           |
| High score group <sup>e</sup> | 0.89<br>(0.55-1.46) | 0.88<br>(0.53-1.47)         | 0.52<br>(0.31-0.85) | 0.51<br>(0.30-0.87)         | 1.39<br>(0.84-2.29) | 1.41<br>(0.83-2.38)         | 0.63<br>(0.38-1.02) | 0.70<br>(0.42-1.17)         |
| Livestock meat                |                     |                             |                     |                             |                     |                             |                     |                             |
| Low score group               | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           |
| High score group <sup>e</sup> | 0.82<br>(0.50-1.34) | 0.87<br>(0.52-1.45)         | 1.12<br>(0.69-1.83) | 1.05<br>(0.62-1.77)         | 1.20<br>(0.73-1.97) | 1.24<br>(0.74-2.08)         | 1.04<br>(0.64-1.69) | 1.12<br>(0.68-1.85)         |
| High calorie diet             |                     |                             |                     |                             |                     |                             |                     |                             |
| Low score group               | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           | 1                   | 1                           |
| High score group <sup>e</sup> | 1.54<br>(0.94-2.53) | 1.78<br>(1.06-2.99)         | 1.17<br>(0.68-1.83) | 1.24<br>(0.73-2.11)         | 1.28<br>(0.78-2.12) | 1.25<br>(0.74-2.10)         | 1.67<br>(1.02-2.74) | 1.86<br>(1.11-3.12)         |

<sup>a</sup> Adjusted for age, gender, mother BMI; <sup>b</sup> Adjusted for age, gender, mother BMI and family smoking status; <sup>c</sup> Adjusted for delivery mode, water consumption and physical exercise; <sup>d</sup> Adjusted for water consumption, father education and mother education; <sup>e</sup> Odds ratio (95%CI).

讨论 上海市长宁区学龄儿童各项消化不良症状发生率高于大部分相关文献报道<sup>[2-5]</sup>。与其他研究相比,上海长宁区学龄儿童较高的消化不良症状发生率可能与多种因素有关,例如本研究调查半年内消化不良症状发生情况,调查周期比文献<sup>[2-3]</sup>更长;本研究的便秘症状是家长和儿童的自我报告,而玉溪市的调查则有严格的诊断标准<sup>[5]</sup>;本研究所在地区是南方,而其他研究大部分研究地区是北方,膳食构成存在较明显差异<sup>[2-4]</sup>。

本研究发现男孩半年内腹泻发生率高于女孩,可能与男孩户外活动频繁和卫生意识略差有关。年龄大可能是儿童半年内腹痛和腹泻的危险因素,推测可能是由于年龄较大的儿童缺少父母监管,独立进餐机会更多,容易形成不良的饮食习惯。母亲超重或肥胖与学龄儿童半年内腹痛和腹泻呈正相关,可能是因为肥胖患者进食更多高热量食物,饮食习惯较差,儿童与母亲长期生活,受其饮食习惯影响较大<sup>[6]</sup>。父母教育程度高与学龄儿童半年内口



臭呈负相关,可能是因为教育程度较高的父母防病意识和卫生意识较好,可能会影响儿童防病意识和卫生意识。本研究显示饮水量可能是学龄儿童口臭的保护因素,原因是饮水可以刺激唾液分泌和保持口腔湿润。本研究显示家庭吸烟可能是学龄儿童腹泻的危险因素,提示儿童暴露于二手烟可能导致儿童腹泻,这与烟雾中有害成分可能通过多种机制导致多种消化道疾病的研究结果一致<sup>[7]</sup>。

海产品类模式可能是半年内腹泻的危险因素。这可能与食用海鲜过程中保存不当或未充分加热杀菌有关<sup>[8]</sup>;也可能是因为上海作为沿海城市,海鲜产品食物相较其他内陆城市和地区食用频率和食用量均有所增加,故更容易发生腹泻等相关症状。海产品类模式可能是半年内便秘的危险因素,这可能是处于海产品类模式儿童摄入较少的蔬菜水果,导致膳食纤维摄入不足<sup>[9]</sup>。以酸奶和鲜奶为代表的奶制品模式可能是半年内腹痛和腹泻的保护因素,可能是由于酸奶中含有丰富的益生菌,能够改善胃肠功能。以新鲜蔬菜和水果为代表的传统膳食模式可能是半年内腹泻的保护因素,可能是由于新鲜蔬菜和水果中富含丰富的膳食纤维<sup>[10]</sup>。高热量模式可能是半年内腹痛和口臭的危险因素,与北京大学医学院所报道的甜食进食频率高导致学龄前儿童口臭的研究结果相一致,可能是摄入过量的高热量食物,胃肠道难以消化吸收,导致食物在腹腔内堆积,并出现口臭和腹痛的消化道症状<sup>[4]</sup>。

综上,本研究结果显示上海市长宁区学龄儿童消化不良症状发生率较高,应得到重视。膳食模式可能影响儿童消化不良症状的发生,合理调整膳食模式可能是降低儿童消化不良症状的方法之一。

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**利益冲突声明** 所有作者均声明不存在利益冲突。

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