Evidence-based Approach to Establish National Physical Activity Guidelines for Children and Young in Taiwan

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Known Facts

- Physical activities can improve children’s health
- World Health Organization (WHO) and many countries have developed their guidelines of recommended amount of children’s PA
- Minute has become the prevailing unit used in PA guideline
Improvements

- Systematically consolidate the amount of PA recommended by different countries from literature
- Provide empirical data of children’s achievement rate of the amount of recommended PA in different countries
- Develop Taiwan’s new guideline of recommended amount of PA into national policy. From three times every week, thirty minutes every time, and 130 heart rate per minute to thirty minutes every day.
Inactivity in children and young’s life is a serious problem worldwide and it has deep influence on them, both physically and mentally.

The leading driver to childhood obesity is:

- lack of PA
- long time of sedentary behavior

(Chen, Liou, & Wu, 2008; Twist, 2001)
The benefits of PA include:

- Improving cardiopulmonary
- Muscles and bone health
- Improving cardiovascular fitness and metabolic health biomarkers
- Improving body composition
- Learning and Intellectual development
- To learn interpersonal and problem solving skills

(United States Department of Health and Human Services, 2008)
In National wide health survey conducted in 2007, the rates of obesity students

- 24.2% for elementary school students
- 25.9% for junior high school students
- 25.1% for senior high school students
- 25.1% for vocational school students

(Liou, Chang, 2007)
The Trend of Classification of Body Weight in 6 to 12 Children

<table>
<thead>
<tr>
<th>Year</th>
<th>Underweight</th>
<th>Normal</th>
<th>Overweight</th>
<th>Obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td>93</td>
<td>18.9</td>
<td>56.9</td>
<td>12.6</td>
<td>11.6</td>
</tr>
<tr>
<td>94</td>
<td>18.6</td>
<td>56.1</td>
<td>12.9</td>
<td>12.4</td>
</tr>
<tr>
<td>95</td>
<td>18.8</td>
<td>55.1</td>
<td>13.4</td>
<td>12.8</td>
</tr>
<tr>
<td>96</td>
<td>18.9</td>
<td>55.6</td>
<td>13.2</td>
<td>12.2</td>
</tr>
<tr>
<td>97</td>
<td>19.6</td>
<td>55.4</td>
<td>13.1</td>
<td>11.9</td>
</tr>
<tr>
<td>98</td>
<td>20.3</td>
<td>54.6</td>
<td>13</td>
<td>12</td>
</tr>
</tbody>
</table>

(衛生署標準)
The Trend of Classification of Body Weight in 13 to 15 Children

<table>
<thead>
<tr>
<th></th>
<th>Underweight</th>
<th>Normal</th>
<th>Overweight</th>
<th>Obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>18.7%</td>
<td>54.2%</td>
<td>12.1%</td>
<td>15%</td>
</tr>
<tr>
<td>96</td>
<td>18.5%</td>
<td>53.7%</td>
<td>12.4%</td>
<td>15.4%</td>
</tr>
<tr>
<td>97</td>
<td>19%</td>
<td>53.9%</td>
<td>12.2%</td>
<td>14.9%</td>
</tr>
<tr>
<td>98</td>
<td>19.3%</td>
<td>53.6%</td>
<td>12.2%</td>
<td>14.9%</td>
</tr>
</tbody>
</table>

(衛生署標準) 27.1%
Inactivity is an Important Factor

- Inactivity is the fourth risk factor of death in the world.
- WHO actively takes the role of promoting physical activities and establishes PA guidelines:
  - Frequency
  - Time
  - Intensity
  - Type
  - Amount of PA
The recommendations to improve health are:

- Children and youth aged 5-17 should accumulate at least 60 minutes of moderate - to vigorous-intensity physical activity daily.
- Amounts of physical activity greater than 60 minutes provide additional health benefits.
- Most of the daily physical activity should be aerobic. Vigorous-intensity activities should be incorporated, including those that strengthen muscle and bone, at least 3 times per week.

(WHO, 2011)
Amount of PA Recommended by Different Countries

Figure 1 Amount of PA recommended by different countries
The Ministry of Education of Taiwan initiated its 333 plan in 1998 as the core vehicle to promote regular exercise.

333 plan means exercise three times every week, 30 minutes every time, and exercise intensity reaching at least 130 heart rate per minute.
Method

- This study used Delphi method to construct recommended amount of PA consensus

- Two rounds of Delphi reviews and two panel discussions were conducted
Study Subjects

- Study subjects are total 105 PA experts from industry, academia, public and private sectors.
# Experts Background Information

<table>
<thead>
<tr>
<th>Role</th>
<th>N</th>
<th>Gender</th>
<th>background information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scholar / Professor</td>
<td>57</td>
<td>M 23</td>
<td>F 24 Physical education, public health, health promotion, nursing</td>
</tr>
<tr>
<td>Principle</td>
<td>7</td>
<td>M 4</td>
<td>F 3 Elementary school, junior high school, senior high / vocational school</td>
</tr>
<tr>
<td>P.E. teacher</td>
<td>4</td>
<td>M 2</td>
<td>F 2 Elementary school, junior high school, senior high / vocational school</td>
</tr>
<tr>
<td>Teacher</td>
<td>6</td>
<td>M 3</td>
<td>F 3 Elementary school, junior high school, senior high / vocational school</td>
</tr>
<tr>
<td>School nurse</td>
<td>6</td>
<td>M 0</td>
<td>F 6 Elementary school, junior high school, senior high / vocational school</td>
</tr>
<tr>
<td>Parents</td>
<td>4</td>
<td>M 1</td>
<td>F 3 Elementary school, junior high school, senior high / vocational school</td>
</tr>
<tr>
<td>Students</td>
<td>14</td>
<td>M 7</td>
<td>F 7 Elementary school, junior high school, senior high school</td>
</tr>
<tr>
<td>Officer of Ministry of Education</td>
<td>3</td>
<td>M 2</td>
<td>F 1 Department of Physical Education, Ministry of Education</td>
</tr>
<tr>
<td>Director of Physical Activity and Health</td>
<td>3</td>
<td>M 2</td>
<td>F 1 one each from northern, central, and southern Taiwan</td>
</tr>
<tr>
<td>Industry</td>
<td>1</td>
<td>M 1</td>
<td>F 0 Sports equipment and instruments</td>
</tr>
<tr>
<td>Total</td>
<td>105</td>
<td>55</td>
<td>50</td>
</tr>
</tbody>
</table>
Procedures and Analysis

- We systematically reviewed related literatures, websites, and focused on policy implementation and current condition of PA
- Offered these data to participants and after two rounds Delphi reviews (n = 63, 43)
- Two panel discussions (n = 26, 22)
The Recommendations of PA Amount and Consensus
The Recommended Amount of Vigorous-intensity PA

- Amount of vigorous-intensity PA for age segment of 7 to 12, 13 to 15, and 16 to 18 should increase as age increase.

- Considering senior high school students face great pressure from schoolwork and the fact that the level of Taiwanese’ PA is low, vigorous-intensity PA is adjusted to 120 minutes every week.

- The second round panel discussion considered future promotion and preferences and agreed to adjust the recommendation to 150 minutes every week.
The Recommended Amount of Moderate-intensity PA

- 210 minutes of moderate-intensity PA every week is recommended for easier campus promotion purpose
- Moderate-intensity PA 30 every day
The Recommendations of Sedentary Behavior

- Experts suggested that elementary school and middle school students’ sedentary behavior should be limited to two hours.
- Sedentary behavior clearly defined as watching TV, playing video games, surfing internet, and using computers at leisure times.
- Students should spend less than two hours on sedentary behavior.
The Recommendations of Physical Education

- 70% to 80% of actual PA is achieved in P.E. class
- Teachers should deliver diversified instruction with particular focus on fitness, health, and interest.
- For between-class exercise, it should consist of large, vivid, diversified, simple and easy-to-learn movement.
The Recommendations of Walking to School

- This study provides recommendation and solutions to issues related to walking to school
- Encourages weekend parents-children interaction
- Changes in school policy and homework design are also important drivers to increase student’s PA
# Proposed Guidelines and Consensus of Physical Activity for Students

<table>
<thead>
<tr>
<th>Items</th>
<th>Physical activity (min/wk)</th>
<th>Sedentary leisure time after school</th>
<th>Physical education</th>
<th>PA in school</th>
<th>Walk to school</th>
<th>PA with family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vigorous physical activity (min/wk)</td>
<td>Moderate physical activity (min/wk)</td>
<td>Watch TV, Play computer game, surf on the web (hr/day)</td>
<td>Time/week</td>
<td>Percent of physically active time in school physical education class (%)</td>
<td>Times/week</td>
</tr>
<tr>
<td>1-2 grades</td>
<td>90 *30 min/occ</td>
<td>210</td>
<td>As less as possible</td>
<td>3-4</td>
<td>70-80</td>
<td>3-5</td>
</tr>
<tr>
<td>3-6 grades</td>
<td>90 *30 min/occ</td>
<td>210</td>
<td>&lt;2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-9 grades</td>
<td>120 *30 min/occ</td>
<td>210</td>
<td>&lt;2</td>
<td>2-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-12 grades</td>
<td>150 *30 min/occ</td>
<td>210</td>
<td>&lt;2</td>
<td>2-3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Definitions of Physical Activity Guidelines for Students

<table>
<thead>
<tr>
<th>項目</th>
<th>身體活動 (分鐘/週)</th>
<th>靜態休閒時間 (週間課後)</th>
<th>體育課</th>
<th>課間活動 (身體活動)</th>
<th>走路上下學</th>
<th>保護活動</th>
</tr>
</thead>
<tbody>
<tr>
<td>年級</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>國小低年級</td>
<td>90 3次30分</td>
<td>210</td>
<td>&lt;2</td>
<td>4</td>
<td>70-80</td>
<td>3.5</td>
</tr>
<tr>
<td>國小中、高年級</td>
<td>90 3次30分</td>
<td>210</td>
<td>&lt;2</td>
<td>7</td>
<td>8</td>
<td>3.5</td>
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<tr>
<td>國中</td>
<td>120 4次30分</td>
<td>210</td>
<td>&lt;2</td>
<td>7</td>
<td>80</td>
<td>3.5</td>
</tr>
<tr>
<td>高中職</td>
<td>150 5次30分</td>
<td>210</td>
<td>&lt;2</td>
<td>7</td>
<td>80</td>
<td>3.5</td>
</tr>
</tbody>
</table>

1. 會提高心肺功能
2. 強度跟慢跑差不多
3. 做這些活動會讓你覺得身體費力
4. 呼吸很喘，說話會喘不過氣，沒辦法一直活動，一面跟別人輕鬆說話
5. 會讓你滿頭大汗，或是心跳加快很多

活動舉例
跑步、打球(如籃球、足球、網球單打)、連續快走跑步、快速游泳、跳繩、登山健行、跳長高、有氧舞蹈

費力活動

1. 可以舒展筋骨，促進新陳代謝
2. 強度跟快走差不多
3. 做這些活動時會讓你覺得身體有點費力
4. 呼吸會比平常喘些，可以舒服的對話，但沒有辦法唱歌
5. 會讓你輕微出汗，或是心跳快一點

活動舉例
快走、打球（籃球、排球、桌球、網球雙打、棒球、壘球）
登山健行，用一般速度游泳（不含慢游、玩水泡泡），用一般速度騎腳踏車，下樓梯、跳舞（如獨舞、啦啦舞）
土風舞、民族舞蹈、健身操、不含慢游）

教育部體育司指導
陽明大學劉新學策畫
Future Development (Application)

- Medical personnel can use systematic literature review, empirical data, and Delphi method to construct the consensus of health indicators and form national health policies.

- With the recommended amount of PA, school nurses can convince schools to change policies to increase PA, P.E. class time, and between-class exercise time to achieve 30 minutes of PA every day.

- The fact that students spend too much time on sedentary behavior is worth further assistance
Thanks for your attention!!