Monitoring the Consumption of Vegetables among OECD Countries, Including Japan

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Summary Increasing intakes of vegetables are associated with risk reduction in various non-communicable diseases, especially cardiovascular disease. In order to compare the proportion of daily vegetable intake among adults from these 30 Organization for Economic Co-operation and Development (OECD) countries as well as Japan, we applied data from the OECD website and the 2017 National Health and Nutrition Survey, Japan (NHNS-J). The figures for Australia, Israel, Korea, New Zealand, and the United States exceeded 80%, where survey questions in these countries asked the amount of intake, instead of the frequency of intake. In Japan, results from the one-day dietary record showed that 99.2% of adults consumed vegetables on the survey day; however, this decreased to 66.3% when assessed by a qualitative question. Proportion of daily vegetable intake as well as average intake amount was higher among those aged 60 y or older. Health policies to increase vegetable intake should target younger age groups to promote health in future generations, in Japan.

Key Words vegetables, survey, dietary intake

Increased intakes of vegetables are associated with risk reduction for various non-communicable diseases, especially cardiovascular disease. Therefore, the American Heart Association issued a dietary guidance in 2021, to improve cardiovascular health and reduce cardiovascular risk (1), suggesting to “Eat plenty of fruits and vegetables, choose a wide variety.” Many countries have adopted similar advice in their national food-based dietary guidelines. In the Dietary Guidelines for Americans, 2020–2025, it is stated that a healthy dietary pattern includes: “Vegetables of all types—dark green; red and orange; beans, peas, and lentils; starchy; and other vegetables, and fruits, especially whole fruit” (2). Since 2000, the Japanese Dietary Guideline (3) advises to “Eat plenty of vegetables and fruits every day, to consume enough vitamins, minerals, and dietary fiber.” Moreover, the current national health policy. “Health Japan 21 (the second term)” (4) aims to increase adult average vegetable intake to 350 g/d.

Monitoring the health risk status across countries, the Organization for Economic Co-operation and Development (OECD) publishes the status of health indicators among its 38 member countries (5). Although smoking, alcohol consumption and obesity are the three major core indicators for individual risk factors of non-communicable diseases, the proportion of the population aged 15+ eating vegetables (excluding potatoes and juice) was obtained for the latest year available.

In this OECD report (5), there is no information on Japan. According to the 2019 National Health and Nutrition Survey, Japan, average vegetable intake (including juice but excluding potatoes) among adults was 280.5 g/d. In 2017, the frequency of vegetable intake among adults was assessed. Therefore, we aimed to compare the current consumption of vegetables in Japan, by applying the OECD definition.

MATERIALS AND METHODS

In order to compare the results from these 30 OECD countries (5) and from Japan, we applied two different data sources. The data on daily intake of vegetables were obtained from the OECD website (https://stats.oecd.org/). Under the section of “Non-Medical Determinants of Health: Food supply and consumption,” we selected “Vegetable consumption, daily (survey data),” The proportion of the population aged 15+ eating vegetables (excluding potatoes and juice) was obtained for the latest year available.

2017 National Health and Nutrition Survey, Japan

The National Health and Nutrition Survey, Japan (NHNS-J) is a nation-wide household-based survey conducted annually since 1946 (6). It currently consists of three components: the one-day dietary survey, the physical examination survey, and the lifestyle questionnaire survey. The lifestyle questionnaire survey is administered to adults aged 20 y and older. In 2017, the intake frequency of 9 selected food groups was assessed in this survey (7), which was conducted in November. Vegetables were divided into two categories, green and colored vegetables, and other vegetables. Participants chose one item from the following 7 items regarding intake frequency during the past month: two times or more per day every day, once a day every day, 4 to 6 times a week, 2 to 3 times a week, once a week, less than once a week, or none. We categorized survey respondents into two groups according to their answers. Those who chose two times or more per day every day, or once a day every day for either green and colored vegetables or other vegetables, were categorized as the daily vegetable intake group. We further selected survey respondents who also participated in the dietary survey, in order to

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compare their average vegetable intake (excluding juice), on the survey day. Potatoes, seaweed, and mushrooms were not included among the vegetables.

RESULTS

Results from the 30 OECD countries

The proportion of the population aged 15 y and older eating vegetables (excluding potatoes and juice) for the 30 countries is shown in Fig. 1. The figures for Australia, Israel, Korea, New Zealand, and the United States exceeded 80%, where survey questions in these countries asked the amount of intake (quantitative), instead of the frequency of intake (qualitative). In Australia, it was based on the question ‘How many servings of vegetables do you usually eat each day?’ The options for the respondent include ‘1 serve’, ‘2 serves’, ‘3 serves’, ‘4 serves’, ‘5 serves’, ‘6 serves or more’, ‘Less than one serve’ or ‘Do not eat vegetables’. In Israel, the number of fruits/vegetables consumed per day was assessed in the population-based telephone survey. In Korea, the results were derived from 24-h recall data. In New Zealand, the survey question was ‘On average, how many servings of vegetables do you eat per day? Please include fresh, frozen and canned vegetables. Do not include vegetable juices.’ The United States also applied a 24-h recall, and the results were weighted.

Results from European countries were based on the question in the core modules in the European Health Interview Survey (8). The question assessing vegetable intake was as follows: “How often do you eat vegetables or salad, excluding potatoes and fresh juice or juice made from concentrate?” Participants chose one of the items below as their answer. Frozen, dried, and canned vegetables were included, but not any kind of vegetable juices or soups (warm or cold).

1. Once or more a day
2. 4 to 6 times a week
3. 1 to 3 times a week
4. Less than once a week
5. Never

In Europe, the proportion of daily vegetable intake was lowest in the Netherlands (33.2%) and highest in Belgium (75.9%).

Results from 2017 National Health and Nutrition Survey, Japan

From the original dataset consisting of 8,027 participants, data on 5,642 adults with both dietary intakes and the responses to the lifestyle questionnaire were selected. Only 46 adults (0.8%) reported no vegetable intake on the dietary survey day. The average intake of vegetables among Japanese adults, grouped according to their sex, age category, and whether they reported daily vegetable intake or not, is shown in Table 1. Sixty-six point three percent of adults reported daily intake of vegetables, but this proportion varied by sex and age. Women had a higher proportion of daily vegetable intake (70.6%) compared to men (61.3%). The proportion was highest among those aged 70 y or older (74.4%) and lowest among the 20- to 29-year-olds (53.0%).

In both men and women, average vegetable intake among those reporting daily intake was higher than for those who were not (310.5 vs. 229.9 g, 291.7 vs. 216.9 g, respectively). Additionally, average intakes among those reporting daily intake were higher among respondents aged 60 y or older, compared to younger age groups.

DISCUSSION

Applying data from the OECD and the 2017 NHNS-J, we were able to obtain an overview of vegetable intake among industrialized countries. From the results of these two data sources, we found that both intake frequency and quantity of vegetable intake should be assessed. Qualitative questions regarding the frequency of intake may be useful in monitoring the habitual intake
of the population, which could be used to estimate the effect of public health policies aiming at increasing vegetable intake. On the other hand, we also need to assess the current amount of vegetable intake among the population, in order to build effective policies to increase their intakes. However, using only the quantitative assessment may lead to overestimation in the proportion of those with daily vegetable intake, as confirmed from the results in Australia, Korea, New Zealand, the United States, and Japan.

The results from the 2017 NHNS-J showed that health policies to increase vegetable intake should target younger age groups. Due to the rapidly aging society, the public is keen on policies aiming at decreasing the risk of frailty and dementia. As frailty is closely related to multimorbidity (9), promoting a healthy diet aimed at reducing the population risk of chronic diseases at younger ages may be essential.

Disclosure of state of COI
No conflicts of interest to be declared.

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REFERENCES