Measures of physical activity and exercise for health promotion by the Ministry of Health, Labour and Welfare

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Abstract The mean number of steps taken by a person, per day in Japan, has decreased significantly over the past 10 years to approximately 1000 steps a day; and the number of people that exercise regularly, among the working population between 20 and 60 years of age, is also decreasing. Such reductions in physical activity and regular exercise are of great concern regarding the health of the Japanese. Healthy Japan 21 (2nd series), a new measure being launched in 2013, will set goals for individuals, such as “increase the number of steps taken,” and “increase the percentage of people that exercise regularly”, as well as goals for regions and municipalities, such as “increase the number of cities facilitating physical activities” and “support municipalities working to improve an active environment”. At present, to enhance physical activity among the Japanese population, the Exercise and Physical Activity Reference (EPAR) for Health Promotion 2006 is being revised to include directions for setting new references of physical activity (including exercise) in leisure time for the elderly, expressed in an easy to understand manner, such as by number of steps or duration of activity, e.g., “let’s move our body 10 min more a day”. Healthy Japan 21 (2nd series) and the new EPAR for health promotion should be utilized to involve a variety of social resources for improving physical activity and exercise habits of the Japanese.

Keywords : policy, physical activity, guideline, health promotion

Measures for health promotion in Japan

Ministry of Health, Labour and Welfare measures for health promotion include a population approach (Healthy Japan 21), and high-risk approach (Specified Medical Checkups and Health Guidance). These measures are currently under review, and new measures will be implemented in 2013.

Healthy Japan 21 (2nd series) (tentative name) is currently in the planning stages. Its focus is on extending the healthy life expectancy, and minimizing the spread in health inequalities within the population. The major points involved in a healthy lifestyle are good lifestyle habits, as indicated in the slogan “First comes exercise, then meals, quit smoking and never do drugs.” In this paper, we focus on physical activity and exercise in presenting an overview of the direction for revision of the Exercise and Physical Activity Reference (EPAR) for Health Promotion 2006¹⁾, and highlighting efforts to improve physical activity and exercise by Healthy Japan 21 (2nd series), which is the cornerstone of the Ministry of Health, Labour and Welfare’s approach to promoting health through exercise.

Current conditions regarding physical activity and exercise habits in Japan

Higher levels of physical activity and exercise are associated with lower risk of non-communicable diseases (NCDs), such as cardiovascular diseases and cancer. Based on the findings of epidemiological studies, the World Health Organization (WHO) has recognized a lack of physical activity as the 4th risk factor (6%) for deaths globally, following hypertension (13%), smoking (9%), and high blood sugar (6%). WHO published “Global Recommendations on Physical Activity for Health” to address this problem in 2010²⁾. In Japan, it has been suggested that insufficient physical activity and exercise is the 3rd greatest mortality risk factor due to NCDs, following smoking and hypertension³⁾. In recent years, it has been reported that physical activity and exercise are related not only to the prevention of NCDs, but also to suppression of reduced social functioning, such as reduced cognitive and motor function in the elderly⁴⁾. Awareness of the significance and importance of physical activity and exercise in the Japanese population is believed to be effective in extending the healthy life expectancy of Japan, which is becoming a super-aged society.

According to the final evaluation of Healthy Japan 21⁵⁾,

the greatest concern, with regard to physical activity and exercise, is the decrease in number of steps taken per day (Fig. 1). Number of steps is an objective index of moderate or vigorous physical activity. At the time Healthy Japan 21 was implemented, the 10-year goal was to increase the number of steps by approximately 1000 steps per day. However, comparison of the average number of steps per day for subjects above the age of 15, in 1997 and 2009, revealed that the mean value decreased from 8202 to 7243 steps among males, and from 7282 steps to 6431 steps among females, representing decreases of approximately 1000 steps. A decrease of 1000 steps per day indicates a reduction in moderate or vigorous physical activity of approximately 10 min every day. The EPAR 2006, issued by the Ministry of Health, Labour and Welfare, recommends physical activity equivalent to or exceeding 8000–10,000 steps every day [23 Metabolic Equivalent Tasks

(METs)-h/week] to prevent lifestyle-related diseases; but Japan's current condition is far from the recommendations, and focused measures are urgently required to improve the situation.

According to the latest evaluation of Healthy Japan 21⁵⁾, the ratio of people participating in regular exercise, defined as exercising at least twice a week for 30 min per bout, for more than 1 year, has increased among both men and women in the over 60 age group, but not among age groups under 60; and has, in fact, decreased among women in most cases (Fig. 2). EPAR 2006 recommended exercising for 1 h or more per week (4 METs-h/week), which is equivalent to 30 min twice a week. However, 70–80% of people, among the working generation, under 60 years of age, do not currently reach this level of activity.

Healthy Japan 21 also evaluated attitudes and awareness regarding physical activity and exercise, such as the

Fig. 1 Change in number of steps for both genders and different age groups (National Health and Nutrition Survey)

Fig. 2 Percentage of people who exercise regularly among both genders and different age groups (National Health and Nutrition Survey)

percentage of people who are conscious of the importance of exercise and the percentage of the elderly with a positive attitude toward going out; the significant increasing in percentage of awareness was observed, in contrast to the decreasing in percentage of people actually participating in regular exercise and number of steps taken. These observations suggest that more people are aware of the importance of physical activity and exercise, and are motivated, but cannot, or do not, take action to implement such activities in their daily lives.

Goal of Healthy Japan 21 (2nd series) with regard to physical activity and exercise

Based on the current situation in Japan, Healthy Japan 21 (2nd series) proposed three main goals with regard to physical activity and exercise: increase the number of steps, increase the percentage of people who exercise on a regular basis, and increase the municipalities that facilitate exercise and physical activity⁶⁾.

It is hoped that by achieving these goals - an increase in physical activity and exercise habits of individuals, and improvement in the social environment - will lead to a reduction in health status inequalities between people, a reduction in middle age mortality, and an increase in

functional capability of daily living in the elderly and longer healthy life expectancy (Fig. 3).

Increase the daily number of steps. Japanese people originally took more steps per day compared to Western countries. Over the past 10 years, however, the number has been approaching that of Western countries (decreasing), eg, US males take 5340 steps and females take 4912 steps per day⁷⁾. Especially for the Japanese working generation with little leisure time, it is necessary to increase not only exercise, but overall physical activity, including daily activities - such as work or household chores - to increase the number of steps and load of moderate to vigorous physical activities. In recent years, pedometers and devices to measure the daily steps and amount of activity have become more widely used; and pedometer functions are, nowadays, often found in cell phones, making it convenient to keep track of the number of steps on a daily basis for most people in Japan.

The National Health and Nutrition Survey measured the number of steps taken on weekdays using a pedometer. In 2010, the average number of steps taken per day by people over the age of 20 was 7136 steps for males and 6117 steps for females. However, because the number of steps decreases after the age of 65, as people age, the subjects

Goal setting for Healthy Japan 21 (2nd) (physical activity and exercise)

Fig. 3 Conceptual diagram of goal setting with regard to physical activity and exercise

were divided into two separate groups: 20-64 years old and 65 and over. The goal was to increase the number of steps taken per day by approximately 1500 steps for each group.

[Index] Increase number of steps
[Current values] 20-64 years old: male 7841 steps/day, female 6883 steps/day
65 years and over: male 5628 steps/day, female 4585 steps/day
[Target values] 20-64 years old: male 9000 steps/day, female 8500 steps/day
65 years and over: male 7000 steps/day, female 6000 steps/day
[Source] National Health and Nutrition Survey 2010

An increase of 1500 steps/day corresponds to approximately 15 min of physical activity when converted to time. When converted to amount of physical activity, this increase in number of daily steps is equivalent to an increase of 0.75-1.0 METs-h/day; equivalent energy consumption would be 50-70 kcal for a 70 kg male and 45-60 kcal for a 60 kg female. Implementation of such a change for 1 year, with no changes in the amount of food intake (energy intake), will result in a loss of 2.0-3.5 kg in body weight.

Based on meta-analysis of a large-scale prospective observational study, increasing the daily number of steps by 1500 steps is equivalent to a decrease of approximately 2-4% in the onset of NCDs and mortality risk⁸⁾; and meta-analysis of a randomized intervention study suggested that this would reduce blood pressure by 1.5-2.0 mmHg⁹⁾. The target values for males and females between 20 and 64 years of age (9000 and 8500 steps, respectively) satisfies the reference value of amount of physical activity in EPAR 2006 (8000-10,000 steps per day or 23METs-h/week)^{1,10)}.

Increase in percentage of people who exercise on a regular basis. A number of individual health problems can be efficiently improved by engaging in exercise at leisure time with the intention of health promotion. Elderly people above 60 years of age, especially, have various risk factors for lifestyle-related diseases. However, they usually have abundant leisure time, and it should be possible and effective for them to actively engage in exercise or leisure activities.

The National Health and Nutrition Survey defined people who consistently exercise at least 30 min, twice a week or more, for at least 1 year, as people who exercise on a regular basis, and surveyed the percentage of the population falling into this category. The percentage of people who exercise on a regular basis is significantly higher in the retired generation compared to the working generation; and, therefore, target values should be set separately for the two age groups (20-64 years old and

aged 65 years and over), just as they were for the number of steps.

Values from the National Health and Nutrition Survey 2010 are considered current values (baseline), and we set our goals to increase the percentage of those who exercise on a regular basis by approximately 10% in both genders and age groups with the target values listed below.

[Index] Increase in percentage of people who exercise on a regular basis
[Current values] 20-64 years old: male 26.3%, female 22.9%
65 years and over: male 47.6%, female 37.6%
[Target values] 20-64 years old: male 36%, female 33%
65 years and over: male 58%, female 48%
[Source] National Health and Nutrition Survey 2010

In a systematic review of a prospective cohort study, it was observed that people who have a regular exercise habit of 30 min twice a week (1 h per week), have approximately 10% reduced risk of onset of NCDs and mortality, compared to those who do not exercise¹¹⁾. A 10% increase, in the number of those who exercise for 1 h per week, will result in a reduction of 1% in the risk of onset of NCDs and mortality among Japanese. Therefore, we set the goal of increasing the percentage of those who exercise at this level by 10% from the current values.

There are separate target values for the 20-64 year-old group and over 65 years old. And, since engaging in exercise during leisure time is strongly influenced by whether one is working or not, different target values had to be set for the elderly population, with a higher percentage of those not working, and the younger generation in which the majority are working.

Increase municipalities engaged in city planning and environmental improvements to facilitate exercise and physical activity.

Physical activity and exercise habits of people are related not only to the individual's awareness and motivation, but also to the living environment and social support systems^{12,13)}. Thus, improvements are needed in living and work environments, within municipalities and work areas, as well as in enhanced social support.

Efforts to create cities and environments that facilitate residents engaging in exercise include:

- (1) Target setting and evaluation of current conditions of a given area
- (2) Improvement of infrastructure, such as sidewalks, bicycle paths, parks and green spaces, and sports facilities
- (3) Implementation of financial policies, such as grants, that promote physical activities and sports, and tax relief
- (4) Efforts at schools to promote children playing outside and engaging in sports
- (5) Peer encouragement of non-active persons to engage in exercise

(6) Spreading of knowledge by utilizing mass media

The number of municipalities actively engaged in the above activities was recently surveyed in 2012. Target values were set after determining the current values and consideration of feasibility.

[Index]	Increase in municipalities engaged in city planning and environmental improvements that facilitate exercise and physical activity
[Current value]	17 municipalities
[Target value]	47 municipalities (all municipalities)
[Source]	Action survey by municipalities about target setting of Healthy Japan 21 (2nd series)

Modification of Exercise and Physical Activity References for Health Promotion 2006 (EPAR 2006)

Issues regarding modification of EPAR. EPAR 2006 is an important means of achieving goals for physical activity and exercise in Healthy Japan 21 (2nd series). The edition enacted in 2006 will be revised on implementation of Healthy Japan 21 (2nd series). A Grant-in-Aid for Scientific Research from the Ministry of Health, Labour and Welfare of Japan for this revision was allocated to the working group for which the author is the representative, and the first meeting of the working group was held to set the agenda for revision of the following 6 items:

- (1) Examine whether changes are necessary in the current reference values
- (2) Implement reference values for the elderly that are not included in the current reference
- (3) Implement reference values that include not only tra-

ditional lifestyle-related disease prevention measures, but also cancer prevention, prevention of reduced functional capability of social living, and prevention of locomotive syndrome and dementia

- (4) Implement references set after consideration of dose-response relationships
- (5) Replace strength and amount of activity with “easy to understand” expressions
- (6) Implement references of physical fitness in forms other than overall endurance

Systematic review and meta-analysis for revision of exercise references.

Based on the above, some keywords were selected to search PubMed and the Japan Medical Abstracts Society on March 25, 2011; and 5107 references were found. Four working group members performed a preliminary review by visually scanning the titles and abstracts. PDFs of 690 references, that fulfilled the selection criteria, were obtained. During the second meeting of the working group, held on May 11, 2011, a method for the extraction of necessary data was determined, and data extraction was performed from intensive reading. Thus, relevant data, that is believed would contribute to the EPAR revision, were extracted from 171 large-scale prospective cohort studies.

On September 16, 2011, the achievements of the working group and contents of its discussions were examined at a session of the Japanese Society of Physical Fitness and Sports Medicine, which is closely related to the EPAR. Discussions on the contents of the 4th and 5th meetings of the working group and data analysis, based on the above, are currently underway (Fig. 4). As of this writing,

Fig. 4 Procedure of systematic review for revising Exercise and Physical Activity Reference for Health Promotion 2006 (EPAR2006).

extracted data are being subjected to meta-analysis, and reference values are being set based on the findings. As a result of a total of five meetings of the working group, as of June 2012, the responses regarding health issues are as below:

- (1) There is no need to change the current reference values.
- (2) Reference values for physical activities (including exercise) during leisure time for the elderly will be set.
- (3) Effective reference values to reduce and prevent lifestyle-related diseases and cancer, and improve the functional capabilities of daily living, will be presented.
- (4) References such as “Let’s be active 10 minutes more per day (example)” will be presented.
- (5) Reference values will be presented in the form of METs-h as well as number of steps or duration.
- (6) Examine the possibility of presenting references regarding walking speed.

Future revision process. In 2012, a review for revision of the EPAR and guidelines will be held by the Ministry of Health, Labour and Welfare; and a revised EPAR, based on the above review results, as well as current Japanese physical activity conditions, trends, and health problems, will be proposed. With regard to the exercise and physical activity guidelines, strategies regarding what regions or work areas should be doing, such as “increase the number of municipalities engaged in city planning and making environmental improvements facilitating exercise and physical activity” as shown in Healthy Japan 21 (2nd series), will be presented along with guidelines for individuals.

Summary

A reduction in the physical activity level, over the past 10 years, has generated concern regarding a significant increase in risk of lifestyle-related diseases, reduced socio-physical functions of the elderly, and social burden for the next generation. A reduction in the level of physical activity and exercise habits, of Japanese, is among the main factors underlying the above issues; and it is, therefore, hoped that the population will utilize Healthy Japan 21 (2nd series), as well as the revised EPAR and guidelines for health promotion, for improving the physical activity and exercise habits of Japanese, through the efforts of individuals, government, and municipalities, and the inclusion of a variety of social capital.

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