



Health Issues of Physical Activity in Daily Life, Exercise and Sedentary Behavior among Japanese Residing Overseas

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Abstract

Physical activity is closely associated with non-communicable chronic diseases such as ischemic heart disease and stroke. Many of the Japanese travel overseas due to the recent globalism. Under the current environment, we expect increasing number of Japanese being exposed to the environment outside of the countries. Past studies showed higher risks for non-communicable chronic diseases due to physical inactivity among Japanese in westernized environment. Since health statistics based on disaggregated data for specific ethnicity provide much more useful information in health promotion, we review health issues on physical activity, exercise, and sedentary behavior specifically among Japanese who reside overseas as the target population. Then, we strive to make useful suggestion on physical activity in daily life, exercise, and sedentary behavior when primary care physicians manage health promotion to Japanese in westernized environment. We also include several suggestions using the mixture of evidence from reported studies and our experience providing care to Japanese residing in westernized environment. We aim to increase efficiency of preventive medicine for Japanese overseas through effective health promotion through physical activity in daily life, exercise, and less sedentary behavior.

Keywords: Health promotion; Physical activity; Exercise; Sedentary behavior; Lifestyle; Japanese in the U.S.A; Preventive medicine; Primary care

Introduction

Recent 'global' and 'borderless' world increase opportunity for people to move other countries. Lifestyle changes occur when people move to different countries. Epidemiological studies demonstrated that health status among Japanese in westernized environment decline [1-3]. The declines were reported to be associated with lifestyle changes including physical activity behavior to which they were exposed [1,4]. Studies investigating Japanese immigrants to western countries found significant increase in cardiovascular disease and cancer [1,5-7]. Additionally, for those who move to different countries, access to care including health maintenance and disease prevention remain unsolved [2,8,9].

Non-communicable chronic diseases (NCDs) such as cardiovascular disease, cancer, and diabetes are the leading causes of death globally. The burden of these diseases is rising enormously. NCDs are strongly associated with poor lifestyle behavior including physical activity behavior. Improving such lifestyle behavior has been called for [8,9]. Japan has gone a process of westernization including lifestyle. Thus, the Ministry of Health, Labour, and Welfare established the National Health Promotion in the twenty-first century (Health Japan 21) [10,11]. People living in westernized countries are exposed to significant westernized lifestyle changes and may have higher risk to develop NCDs without adequate care [12-14]. Health professionals need to promote patients' healthy lifestyle in primary care where majority of the medical management occur. For this, evidence to support the primary care physicians' practice for NCDs prevention is needed through the health promotion such as physical activity, exercise, and less sedentary behavior among people living in other countries.

However, little evidence exists to support physicians' practice. Aggregated data among the Asian who are composed with many different cultures and genetic backgrounds may not applied to a specific ethnicity. This short review primarily describes the evidence to support primary care physicians' health promotion through changing physical activity behavior to Japanese living in westernized countries based upon series of the previously performed research among the target

population. This review also emphasizes the immediate necessary work to be promoted in the area of NCDs prevention among other ethnicities.

Studies about lifestyle issues for the target population

In Japan the Ministry of Health, Labour, and Welfare conducts the National Health and Nutrition Survey (J-NHANS) annually which monitors health status for Japanese at the national level [11]. This survey based on the Health Promotion Law provides vital statistics of physical activity, diet and nutrition, smoking and alcohol, and mental health among Japanese. Based on the statistics reported from the J-NHANS which provide the baseline population data for physical activity behavior for the population, the Health Japan 21 (previously mentioned) actions has been implemented by setting recommended goals for the population [10]. Special attention to people including Japanese residing overseas who has higher risks of NCDs and limited access to care should be paid [3,4,15]. Following section reviews the existing lifestyle data from studies for the Japanese living in westernized countries and compared with the national data (J-NHANS). Then, we made specific suggestions from clinical perspectives on managing physical activity and sedentary behavior specific to the Japanese in westernized countries. Comparing a population data with national average and goal for healthy lifestyle provides useful information. While little evidence exists in the specific ethnicity, this approach of analysis will be shown as a valuable one applicable to other ethnicity.

In this review, we define any bodily movement produced by skeletal muscles that results in energy expenditures as physical activity with

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subcategory of exercise and physical activity in daily life. Exercise is planned, structured, and repetitive activity for improving physical fitness. Physical activity in daily life is the physical activities other than exercise such as the activity in occupation and in house hold. Sedentary behavior is defined as any waking activity less than 1.5 metabolic equivalents (METs) such as sitting, lying, watching TV, and using a computer.

Physical activity in daily life and exercise

The prevalence of exercise and physical activity in daily life among Japanese in Pittsburgh were less than age- and gender-matched J-NHANS result as shown in (Table 1 and 2). Previously, Kitamura et al. reported that about half of the Japanese in Michigan, U.S.A. exhibited decreased time of the exercise after moving [14]. Same tendency to less activity was found in physical activity in daily life among Japanese in Pittsburgh (Table 1). With regard to intense of exercise, while we found that 85.0% of male and 78.9% of female Japanese engage some intensity of exercise based on the METs as light, moderate, and vigorous for <4, 4-6, and >6 METs, respectively, only 45% of male and 26.3% of female meet the recommended level of exercise (Table 2). By comparing Pittsburgh data with the Health Japan 21, it becomes clear where the target population at large needs improvement as shown in (Table 1). In the counselling for physical activity in daily life and exercise, primary care physicians should inform the recommended level of the physical activity as a goal. American College of Sports Medicine released the evidence-based guideline for prescribing exercise and recommended that adults should engage at least 150 minutes per week with moderate level of physical activity or 75 minutes per week with vigorous level of

exercise [16]. Then, specific planning for exercise and physical activity in daily life to meet the recommendation can be discussed according to their preference and daily schedule with considering safety in access of activities.

Sedentary behavior

Sedentary behavior such as sitting, lying, watching TV, and using a computer are reported independent risk factors to develop NCDs [17,18]. It is also studied that sedentary behavior may not be related to physical activity behavior [19]. In other words, people who engage recommended level of exercise may have an independent risk factor to develop NCDs if holding sedentary behavior. In our study, the prevalence of sedentary behaviors for both male and female was lower when compared to the J-NHANS data as shown in the (Table 3) [20]. The relation between exercise engagement and sedentary behavior was not found, similarly to the previous studies. Thus, in the management of promoting physical activity, primary care physicians need to pay attention not only physical activity in daily life and exercise but also sedentary behavior. When discussing a specific plan for physical activity, it is important for both health professionals and patients to discuss the approach to decrease sedentary behavior whenever applicable [21,22].

Limitations and applicability

Limitations of this review should be discussed. First of all, this review focuses on the target population as Japanese residing overseas. Many of the articles discussed that Asian subgroup have different cultures and health behavior patterns and study should consider providing culturally tailored, ethnic specific target to these diverse populations

Physical Activity Behavior	Japanese in Pittsburgh	Age- and Gender-matched Average (J-NHANS [§])	Health Japan 21 Goal	Status of Attainment [†]
Male				
Physical activity in daily life	15.8%	51.8%***	≥ 63%***	Unattained
Walk more than 1 hour	10.5%	63.3%***	-	-
Regular exercise	21.0%	28.6%	≥ 39%**	Unattained
Female				
Physical activity in daily life	12.7%	53.1%***	≥ 63%***	Unattained
Walk more than 1 hour	12.7%	58.3%***	-	-
Regular exercise	10.9%	24.6%*	≥ 35%***	Unattained

†Comparison between Japanese in Pittsburgh and Health Japan 21 as a goal (Attained; Japanese in Pittsburgh data reached the goal, Unattained; Japanese in Pittsburgh data did not reach the goal)

§J-NHANS; the National Health and Nutrition Survey in Japan

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. [22]

Table 1: Comparison of Prevalence of Physical Activity Behavior among Japanese in Pittsburgh, Japanese National Average, and Health Japan 21.

Characteristics	Male		Female		Total	
	Pittsburgh	J-NHANS [†]	Pittsburgh	J-NHANS [†]	Pittsburgh	J-NHANS [†]
Reach recommended goal of Exercise [§]	45.0	-	26.3	-	34.0	-
Moderate PA in daily life						
Yes, every day	2.5	24.3	10.5	22.6	7.2	23.4
Vigorous PA in daily life						
Yes, every day	7.5	12.3	3.5	10.0	5.2	11.1
Highest level of exercise engaged						
Light	15.0	5.6	29.8	8.4	23.7	7.4
Moderate	22.5	7.4	24.6	6.5	23.7	6.8
Vigorous	47.5	4.6	26.3	2.6	35.1	3.3

†J-NHANS; the National Health and Nutrition Survey in Japan

§Moderate level of exercise for 150 minutes a week or vigorous exercise for 60 minutes a week

* $p < 0.001$ [22]

Table 2: Comparison in Prevalence of Physical Activity and Exercise between Japanese in Pittsburgh versus Age- and Gender-matched J-NHANS[†].

Sedentary behavior	Male		Female	
	Pittsburgh	J-NHANS [†]	Pittsburgh	J-NHANS [†]
Sitting/lying, weekday				
Longer half group ^a	50.0 ^{n.s.}	50.8	45.6**	73
Sitting/lying, weekend				
Longer half group ^b	42.5*	60.6	33.3**	78.3
TV/computer, weekday				
Longer half group ^c	52.5*	37.1	56.1*	73
TV/computer, weekend				
Longer half group ^c	42.5 ^{n.s.}	54.7	28.9**	81.2

a Sitting/lying time > 8 hours/day for male and > 6 hours for female

b Sitting/lying time > 6 hours/day for male and > 4 hours for female

c TV/computer time during weekday > 4 hours/day for male and > 2 hours/day for female

[†]J-NHANS; the National Health and Nutrition Survey in Japan

* p < 0.05; **, p < 0.001; n.s., non-significant. [22]

Table 3: Comparison of Sedentary Behavior Rate between Japanese versus Age- and Gender-matched J-NHANS[†].

[23,24]. This review targets the specific ethnic group, Japanese living overseas in this regards. Thus, management of health promotion in a different geographic area among the same ethnicity should consider a different prevalence of physical activity behavior where they reside. Secondly, majority of the study design relevant to health promotion through physical activity behavior are cross-sectional. These types of study design do not reveal causal relationship. We should call for well-designed intervention studies of suggested managements and how beneficial its approach would be are the future interest. Finally, development of cardiovascular disease seems to begin from early in life. Obesity, for example, continuously become more prevalent for childhood. There are little evidence on the lifestyle behavior among the young age. Much more evidence for children and adolescent population also requires.

Conclusion

We reviewed the evidence of previously reported studies including our studies in the area of physical activity, exercise, and sedentary behavior among Japanese residing overseas. Then, we made some suggestions in the management of health promotion through physical activity and less sedentary behavior to the targeted population. The reviewed results in some studies were compared with the age- and gender-matched national data from J-NHANS and also the recommended population goal by Health Japan 21. This approach allows medical professionals to consider specific and concrete planning for health promotion through physical activity behavior.

In our study, the percentage of receiving annual health maintenance exam among Japanese in Pittsburgh who have their primary care physicians is much lower as compared to the Japanese average in Japan (male; 38.5% vs 68.5%, female; 17.5% vs 45.1%, respectively) [12]. Limited access to medical care has been reported among minority ethnicity including Asian in other countries. Thus, primary care physician should pay special attention the access to preventive medicine among the target population in the community when promoting health through physical activity behavior as a population strategy. Lastly, this review is hoped to promote better preventive care of NCDs and call for the needed future evidence in this field.

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