

# Are Korean Adults Meeting the Recommendation for Physical Activity during Leisure Time?

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**Abstract.** [Purpose] The purpose of this study was to determine if Korean adults meet their physical activity recommendations during their leisure time to promote a healthy living. [Subjects and Methods] The sample included South Korean adults, aged over 20, who were currently residing in K City, South Korea. The author used a quota sampling technique to select 1,000 samples. Of the 1,000 questionnaires distributed, 845 questionnaires were used to conduct a  $\chi^2$  test. [Results] It was revealed by the questionnaire that there was a clear distinction in the categories of very high level activity (11.0%), high level activity (29.1%), acceptable level activity (12.9%), low level activity (9.7%), and inactive level of physical activity (38.3%) in Korean adults' leisure time. [Conclusions] The most interesting finding was that more than half of Korean adults do reach the recommendation of at least 30 minutes of moderate activity, on three or more days a week for at least three months. The other interesting finding was that the questionnaire is a useful instrument suitable for analyzing the recommendations of physical activity, comprising frequency, intensity, time, and overall duration.

**Key words:** Adult, Health, Physical activity recommendation

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## INTRODUCTION

Exercise, physical activity, physical fitness, and sports are terms that are usually used in scientific literature to promote health. Presently, Korean society is moving towards a sedentary lifestyle, and there is a need to increase physical activity levels during leisure time to promote health. The surge of academic and professional interest in the effects of physical activity has resulted in a large amount of literature on interventions and guidelines for physical activity. In addition, epidemiological studies have reported a reduction in incidences of cardiovascular diseases in more physically fit people<sup>1, 2)</sup>, and a reduction of atherosclerotic risk factors in more physically active people<sup>3–5)</sup>. Other studies have consistently documented the positive effects of exercise on depression<sup>6–8)</sup>, body image<sup>9–11)</sup>, and life satisfaction and social interaction<sup>12)</sup>.

Since there are positive effects of physical activity on health status resulting from participating regularly in physical activity, promoting higher levels of physical activity during leisure time is often emphasized. Many nations have developed recommendations for physical activity for health purposes<sup>13)</sup>. The recommendations deal with guidance on the dose-response relationship between the frequency, du-

ration, intensity, and type of physical activity needed for the prevention of non-communicable diseases and the overall general health of the population. It is recommended that Korean adults should complete at least 30 minutes of at least moderate activity on three or more days a week<sup>14)</sup>. There are various guidelines as to how often one should exercise to improve or maintain health or physical fitness. Although the recommendations remain controversial, measurements of habitual physical activity have become an interesting and important topic of study. Therefore, many countries of the OECD estimate physical activity levels, describe the prevalence of physical inactivity, and analyze this information to identify health promotion strategies that would have the maximum benefits.

Several different ways of measuring habitual physical activity have been developed. These include the direct calorimetry test, which is the ingestion of doubly labeled water and the use of motion sensors, accelerometers, heart rate recorders, oxygen consumption meters, direct observation of movement, assessments of food intake, and questionnaire assessments<sup>15–18)</sup>. Among these, questionnaires have become the most feasible way of measuring physical activity levels in large populations. A common problem with physical activity questionnaires is that they have limited reliability and validity. However, a simple questionnaire assessment of physical activity levels is still considered to be more appropriate than attempting to estimate the overall energy expenditures of people in large populations<sup>19)</sup>. Physical activity questionnaires have pertinent value in monitoring changes in a population's activities<sup>15)</sup>. Furthermore, because much of the literature concerning physical activity questionnaires is based on guidelines for exercise<sup>15, 20)</sup>,

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quantification of the level of intensity, frequency, and the duration of physical activity that is performed is needed. Especially, the scarcity of data from a simple questionnaire based on guidelines or recommendations of physical activity requires researchers to monitor physical activity at a population level using the basic principles of intensity, frequency, time, and overall duration. Therefore, the purpose of this study was to determine if Korean adults meet physical activity recommendations during leisure time to promote a healthy living.

## SUBJECTS AND METHODS

The sample included South Korean adults, aged over 20, who were residing in K City, South Korea. The author used a quota sampling technique to select representative samples. First, the author randomly selected one senior center, one residential culture center, a YWCA center, and one sports center in K City. These centers are public locations where members of the community tend to gather for different recreational programs such as various sports, different activities in fitness gyms, social support, painting, and public information. Second, the author randomly selected 250 samples from each of the centers. Of the 1,000 questionnaires distributed, 900 questionnaires were returned, but 55 questionnaires were deemed unusable because of duplicate or incomplete responses. 348 (41.2%) respondents were males while 497 (58.8%) were females. The respondents ranged in age from 20 to 80 years old.

The questionnaires consisted of questions on: demographics, recreational activity type during leisure time, and physical activity level. Types of recreational activities involved a simple five-item question on recreational activities based on previous studies<sup>20-22</sup>. The first question identified the type of recreational activity the adults participated in during their leisure time. An expert panel in the field of sports and recreation was invited to classify the activities into five different types of recreational activities. The categorizations of recreational activities were aerobic exercise and sports (walking, biking, jogging, swimming, aerobics, basketball, softball, soccer, golf, table tennis, badminton, football, etc), flexibility exercises (stretching, yoga, Pilates, calisthenics, etc), muscular exercises (weight training, free weight training), arts and cultural activities (reading, writing, playing cards, dance and music, etc), and simple entertainments (spectator sports, movies, television, etc).

The second question was "during the week, how often do you participate in the activity in your free time?" The choices for frequency of physical activity were "almost every day", "4-5 days/week", "3 days/week", "1-2 days/week", and "sometimes". The third question was "how intensely do you participate in the activity?" The choices for intensity of leisure participation were "very hard", "hard", "moderate", "light", and "very light". The fourth question was "how long do you do the activity in your free time?" The choices for duration of leisure participation were "less than 30 minutes", "30-60 minutes", "60-90 minutes", "90-120 minutes", and "more than 150 minutes". The final question was "how long have you participated in this activity?" The

choices for overall duration of activity participation were "almost 1 month", "2 months", "3 months", "4 months", and "more than 5 months". A physical activity index was constructed based on respondents' answer to questions related to the frequency, intensity, duration, and overall duration of their participation in the recreational activity.

For each item, a 5-point Likert-type response format was used with values ranging from 1 to 5. To determine the physical activity index, the response for frequency, intensity, and duration were summed, then the sum scores were multiplied by the scale score for the overall duration of the activity. The maximum and minimum scores were "75" and "3", respectively. Finally, the physical activity index was divided into five categories: "very high level", "high level", "acceptable level", "low active level", and "inactive level". The specific cut-offs used for classification of the physical activity index were: "very high level (75)", "high level (48-74)", "acceptable (27-47)", "low level (12-26)", and "inactive level (3-11)". For example, respondents were classified as "high level" if they reported hard intensity activities for at least 90-120 minutes per day, four to five days per week for four months. Higher scores indicated higher activity levels during their leisure time. The average inter-item correlation for the recreational activity level questionnaire was 0.620.

To ensure content and internal validity, an item pool was generated. Then, the instrument was constructed and evaluated by the authors. Lastly, the instrument was sent to a panel of recognized experts in the field of recreation, medical and social services. The selected experts were asked to evaluate and comment on the initial questionnaire with regard to: the clarity of questions; the appropriateness of the items included within each question; and the overall applicability of the survey. Finally, comments were noted and appropriate revisions were made.

Approval for this study was obtained from the Institutional Review Board of Daegu University. Copies of the survey questionnaires were distributed to each of the 250 samples from the four different community centers in K city, South Korea. The researcher approached the selected institutions to request their cooperation with the survey. Written consent forms and questionnaires were distributed to the participants by the researcher. The participants were informed that participation in the study was voluntary, and that they were free to withdraw from the study at any time. The author waited until the participants had completed the consent forms and questionnaires, then collected them.

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS 10.0) Windows computer software. Descriptive statistics were used to analyze the patterns of physical activities of Korean adults. In addition, the chi square test was conducted to test differences in the levels of physical activity among Korean adults. Significance was accepted for values of  $p < 0.05$ .

## RESULTS

Among the Korean adults, 38.9% participated in non-vigorous physical activities such as arts and cultural ac-

**Table 1.** Differences in the levels of physical activity during leisure time

	Variables	Frequency	Percent	$\chi^2$ (p)
Recreational activity type	Aerobic exercises	301	35.6	284.30 (0.001)
	Flexibility exercises	113	13.4	
	Muscular endurance exercises	102	12.1	
	Arts and cultural activities	190	22.5	
	Simple entertainment activities	139	16.4	
Physical activity levels	Inactive level	323	38.3	
	Low level	74	9.7	
	Acceptable level	109	12.9	
	High level	246	29.1	
	Very high level	93	11.0	
	Total	845	100	

tivities (reading, writing, playing cards, dance and music etc.), and simple entertainment (spectator sports, movies, and television, etc.) during their leisure time. The most frequently reported physical activities performed by Korean adults during leisure time were aerobic exercises (n=301, 35.6%), flexibility exercises (n=113, 13.4%), and muscular endurance exercises (n=102, 12.1%), respectively.

The percentages of very high, high, acceptable, low, and inactive levels of physical activity during the leisure time of Korean adults were 11.0%, 29.1%, 12.9%, 9.7%, and 38.3%, respectively. The chi-square test was conducted to assess whether or not Korean adults meet physical activity recommendations during their leisure time to promote a healthy lifestyle. The results of the test were significant,  $\chi^2$  (4, N = 845) = 284.30, p = 0.001. The proportion of Korean adults who participated in an acceptable level (p=0.13), the proportion who participated in very high level of physical activity (p=0.11), and the proportion who participated in low level of physical activity (p=0.09) were lower than the hypothesized proportion of 0.20, while the proportion of Korean adults who participated in high level (p=0.29) and the proportion of Korean adults who participated in an inactive level (p=0.38) were greater than the hypothesized proportion of 0.20 (Table 1).

## DISCUSSION

It is widely acknowledged that doing regular physical activity can have a number of benefits for everyone. The Korean government and other organizations have proposed scientifically informed recommendations on the frequency (at least three times a week), duration (at least 30 minutes), and intensity (moderate) of physical activities necessary for health benefits and analyzing physical activity levels<sup>14, 23</sup>. The chi-square test was conducted to determine if Korean adults meet physical activity recommendations during leisure time to promote a healthy lifestyle. The participation percentages of very high, high, acceptable, low, and inactive levels of physical activity during leisure time were 11.0%, 29.1%, 12.9%, 9.7%, and 38.3%, respectively. The results of this study establish that 53% of Korean adults were likely to meet the physical activity recommendations beneficial for

health during their leisure time.

In recent years internationally comparable data on levels of physical activity across different nations have begun to be collected. Thus, some comprehensive data is available about trends and levels of physical activity. The Australian Bureau of Statistics reported that 38% of Australian adults met the recommended physical activity guidelines, based on an analysis of data from the National Health Survey conducted in 2007–2008<sup>24</sup>. The Australian national physical activity guidelines for adults recommend at least a moderate level of physical activity, most days of the week, for a total of 30 minutes or more on each of those days, and with each session lasting 10 minutes or more<sup>25</sup>. Another study used a Eurobarometer survey that interviewed 26,788 European citizens to provide a context for interpreting the physical activity levels of European countries. It was reported that 27% of the subjects surveyed engaged in physical activity regularly (at least 5 times a week) while 14% of them were physically inactive, i.e. they did not participate in any kind of physical activity<sup>26</sup>. Another study assessed physical activity levels of adults in their leisure time in England by examining their overall participation in activities and by describing the frequency of participation and the type of activity. Key findings from the survey were that 39% of men and 29% of women aged 16 and over met the government's recommendations for physical activity, compared with 32% and 21% respectively in 1997<sup>27</sup>. The Canadian Health Measures Survey, which collects both self-reported and direct measures of Canadians' health, measured the physical activity of Canadians through the use of an activity monitor worn by respondents for one week following their visit to a mobile examination centre. Data collected from 2007 to 2011 showed that about 15% of Canadian adults met the current physical activity guidelines recommended for their age group. Among adults, more men (17%) than women (13%) met the guidelines<sup>28</sup>. It is recommended that Canadian adults 18 and over should get at least 150 minutes of moderate-to-vigorous physical activity (MVPA) per week, made up of time periods lasting at least 10 minutes<sup>29</sup>.

The between-countries comparison of physical activity levels using different measures is problematic compare because the physical activity prevalence estimates

for one country can differ depending on the data collection methods used<sup>30</sup>. Although some countries conduct international physical activity surveillance, understanding and comparison of each of these surveys is still required. Existing physical activity assessment questionnaires differ as to which domains are measured and few assess multiple domains<sup>31</sup>. Historically, many questionnaires are inclined to take into account the time spent participating in physical activities and the number of physical active days, and some questionnaires only focus on frequency, time, and intensity of physical activity. Therefore, physical activity level questionnaires are needed to measure frequency, time, intensity, and overall duration of physical activity participation.

In summary, the most interesting finding of the present study was that it is an instrument suitable for measuring recommendations of physical activity in the four main dimensions of frequency (usually measured in occasions per week), intensity (at which the activity is carried out), time (the duration of the bout of activity), and the overall duration (overall duration of activity participation). The other interesting finding was that more than half of Korean adults do reach the recommendations that adults should achieve at least 30 minutes of at least moderate activity, on three or more days a week for at least three months. Consequently, when compared indirectly with physical activity levels of subjects living in other countries, the proportion of Korean adults meeting the recommended levels of physical activity is higher than that of people living in other countries, and that they are also more physically active than people living in other countries, although different measurement methods were used.

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