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**【Practice Article】**

## International Comparison of the National Prevalence Study and Guidelines on Physical Activity in Adults among Some Asian Countries

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**ABSTRACT Purpose:** This report was written with two goals: The first goal was to compare the differences between physical activity guidelines of each Asian country. The second goal was to compare the methods and results of the physical activity assessments of each of the Asian countries.

**Methods:** We performed a comprehensive search of Google Search, Google Scholar, MEDLINE, ELSEVIER, BioMed, and BMC Public Health search for information on the physical activity guidelines, as well as the methods and results of physical activity assessment across all Asian countries (n=51).

**Results:** We obtained the physical activity guidelines, methods and results of physical activity assessment from six countries (Hong Kong, Malaysia, Singapore, Saudi Arabia, Korea, and Japan). The physical activity guidelines of many countries were similar to those recommended by the WHO such as “at least 150 minutes of moderate level aerobic exercise, or 75 minutes of intense aerobic exercise per week”. Numerous countries have also been using the same definition of physical activity as the WHO such as “do meet at least one of the following criteria; 1) three or more days of vigorous activity of at least 20 minutes per day, 2) five or more days of moderate-intensity activity or walking of at least 30 minutes per day, 3) five or more days of any combination of walking, moderate- intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week” for the purposes of physical activity assessment.

**Conclusions:** The publication of English versions of each country’s physical activity guidelines and sharing of information would, therefore, lead to further improvement of each country’s physical activity guidelines. Moreover, it is ideal to use survey methods that assure comparability on minimally required items at an international level.

**Key words:** physical activity, physical inactivity, GPAQ, IPAQ, international comparison

### Introduction

Physical activity levels are declining in many countries. While this is one of the main reasons for the increased prevalence of non-communicable diseases, it has also proven to be one of the main challenges in

the areas of public health<sup>1,2)</sup>. Asian countries are no exception to this trend in the prevalence of non-communicable diseases, increasing the ever-important need for initiatives to prevent them. Therefore, the formation and publication of physical activity guidelines to promote population health and standardize assessment of physical activity/inactivity at international levels are essential. However, there are no reports regarding the comparison of national physical activity guidelines and physical activity assessments among Asian countries. Thus, this report was written with two goals. The first goal was to compare the

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differences between physical activity guidelines of each Asian country. The second goal was to compare the methods and results of the physical activity assessments of each of the Asian countries.

## Methods

We performed a search based on ease of access of Google Search, Google Scholar, MEDLINE, ELSEVIER, BioMed, and BMC Public Health search for information on the physical activity guidelines, as well as the methods and results of physical activity assessment across all Asian countries (n=51) from September 10th to 30th, 2014. Key words included physical activity guidelines, physical activity assessments, national physical activity prevalence, and national health survey among others. National physical activity guidelines for Asian countries were searched and compared along with the methods and results of physical activity assessments implemented on or after 2010.

## Results

We obtained the physical activity guidelines, methods and results of physical activity assessment from six countries (Hong Kong, Malaysia, Singapore, Saudi Arabia, Korea, and Japan). Although a thesis

related to physical activity guidelines was also made public in Korea, the main body of the thesis was only available in Korean, thereby preventing us from understanding the details of the report<sup>3</sup>). Therefore, Korea was excluded from the present report.

### *Physical activity guidelines*

The physical activity guidelines of many countries were similar to those recommended by the WHO<sup>1</sup>). In other words, they recommended at least 150 minutes of moderate level aerobic exercise, or 75 minutes of intense aerobic exercise per week. Japan recommended a higher amount of physical activity in its guidelines compared to levels recommended by the WHO.

Several countries employed a catch phrase to promote physical exercise. Malaysia employed the phrase “Be physically active everyday”<sup>4</sup>). Singapore used, “Some physical activity is better than none and more is better than some”<sup>5</sup>), while Saudi Arabia used “Little exercise better than none”<sup>6</sup>). In Japan, the catch phrase “Plus 10” was used to promote increasing one’s current exercise level by 10 minutes to add healthy years to their lifespan<sup>7</sup>).

### *Physical activity assessment*<sup>8-13</sup>

Numerous countries have been using the same definition of physical activity as the WHO for the

**Table 1** Physical activity assessments in five Asian countries

Country	National Surveillance	Survey design Sampling Procedures	Type of questionnaire	Age (Sample Size)
Hong Kong <sup>8)</sup>	The Behavioral Risk Factor Surveillance System 2012	A cross-sectional survey population based random sampling	IPAQ short form (Telephone interview)	18-64 yrs (2,041)
Malaysia <sup>9,10)</sup>	National Health and Morbidity Survey 2011	A cross-sectional survey population based two-stage stratified random sampling	IPAQ short form (Interview)	≥16 yrs (12,196)
Singapore <sup>11)</sup>	National Health Survey 2010	A cross-sectional survey population based two-stage stratified random sampling	GPAQ (Interview)	18-69 yrs (4,337)
Saudi Arabia <sup>12)</sup>	Health Information Survey 2013	A cross-sectional survey population based two-stage stratified random sampling	IPAQ (Interview)	≥15 yrs (10,735)
Japan <sup>13)</sup>	National Health and Nutrition Survey 2012	A cross-sectional survey population based two-stage stratified random sampling	Own Standard Questionnaire (Questionnaire)	≥20 yrs (16,595)

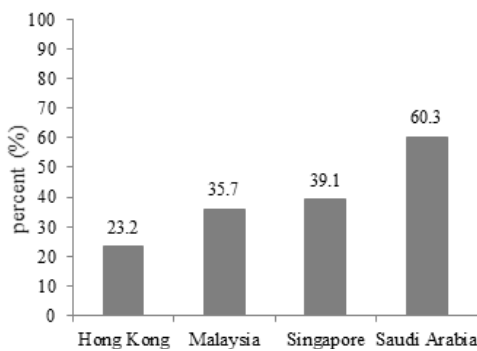
IPAQ; International Physical Activity Questionnaire, GPAQ; Global Physical Activity Questionnaire

purposes of physical activity assessment<sup>1)</sup>. Table 1 shows the summary of physical activity assessments in five countries.

All countries had made a cross-sectional assessment of a randomly selected sample of citizens. Singapore used the Global Physical Activity Questionnaire (GPAQ), while Hong Kong, Malaysia, and Saudi Arabia used the International Physical Activity Questionnaire (IPAQ). Japan used an original questionnaire, such as “at least two exercise sessions per week, each lasting longer than 30 minutes, continued over at least one year”, to collect information on physical activity. The target age group of the assessment varied between countries. Saudi Arabia selected citizens from 15 years of age, Malaysia 16 years of age, Singapore and Hong Kong 18 years of age, and Japan 20 years of age. Japan published the results of physical activity assessment in English. However, Japan used an original questionnaire. Therefore, Japan was excluded from the following analysis.

*Status of Physical Inactivity*

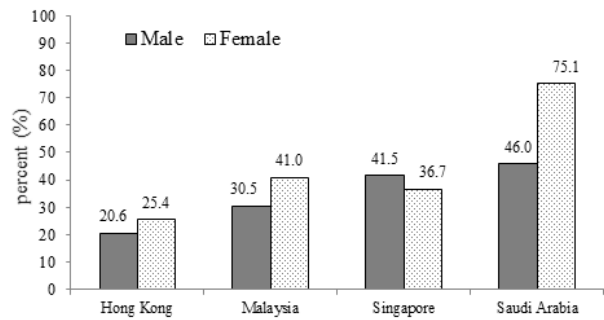
Figure 1 shows the prevalence of physical inactivity of four Asian countries. The prevalence of physical inactivity is defined as a proportion of people who do not meet at least one of the following criteria; 1) three or more days of vigorous activity of at least 20



**Figure 1** Prevalence of physical inactivity in four Asian countries

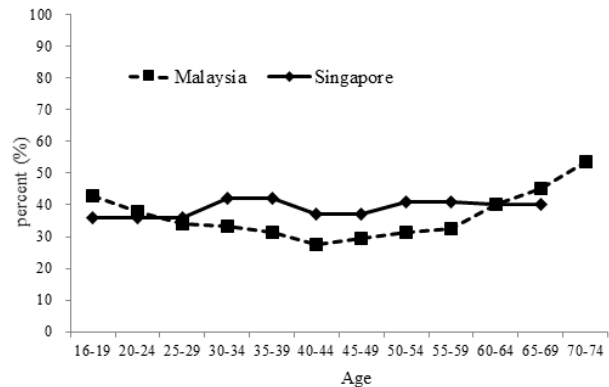
Physical inactivity is defined as who do not meet at least one of the following criteria; 1) three or more days of vigorous activity of at least 20 minutes per day, 2) five or more days of moderate-intensity activity or walking of at least 30 minutes per day, 3) five or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.

minutes per day, 2) five or more days of moderate-intensity activity or walking of at least 30 minutes per day, 3) five or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week. Hong Kong, Singapore, and Malaysia showed the prevalence of physical inactivity less than or equal to 50%.



**Figure 2** Prevalence of physical inactivity in four Asian countries by Gender

Physical inactivity is defined as who do not meet at least one of the following criteria; 1) three or more days of vigorous activity of at least 20 minutes per day, 2) five or more days of moderate-intensity activity or walking of at least 30 minutes per day, 3) five or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.



**Figure 3** Prevalence of physical inactivity in Malaysia and Singapore by Age Group

Physical inactivity is defined as who do not meet at least one of the following criteria; 1) three or more days of vigorous activity of at least 20 minutes per day, 2) five or more days of moderate-intensity activity or walking of at least 30 minutes per day, 3) five or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.

### Physical Inactivity of each country by Gender

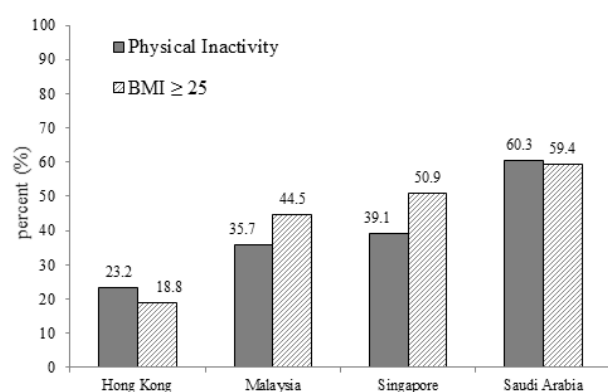
Figure 2 shows the prevalence of physical inactivity of each country by gender. The country that demonstrated a significant gender difference was Saudi Arabia, where women showed a prevalence of physical inactivity that was clearly higher than that of men. Similarly, women showed higher prevalence of physical inactivity in Hong Kong and Malaysia.

### Physical Inactivity of each country by Age

Figure 3 shows the prevalence of physical inactivity of Malaysia and Singapore by age group. These countries used different physical activity questionnaires. However, the prevalence of physical inactivity were relatively similar throughout all age groups.

### The prevalence of physical inactivity and Overweight/obesity rate of each country

Figure 4 shows the prevalence of physical inactivity and the proportion of people with a BMI 25 or more (overweight/obese) in the four Asian countries. The prevalence of physical inactivity and the proportion of people with a BMI 25 or more showed similar values, suggesting a possible positive correlation between the proportions of physical inactivity and overweight/obesity.



**Figure 4** Prevalence of physical inactivity in four Asian countries and the Ratio of people with BMI 25 or more (Overweight/obesity)

Physical inactivity is defined as who do not meet at least one of the following criteria; 1) three or more days of vigorous activity of at least 20 minutes per day, 2) five or more days of moderate-intensity activity or walking of at least 30 minutes per day, 3) five or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.

## Discussion

We obtained the physical activity guidelines, methods and results of physical activity assessment from six countries. The physical activity guidelines of many countries were similar to those recommended by the WHO. Numerous countries also have been using the same definition of physical activity as the WHO for the purposes of physical activity assessment.

Bauman et al. comparatively studied the prevalence of physical inactivity by country in 2002-2004, based on the IPAQ in 20 nations on 52,746 adults between ages 18-65<sup>14</sup>). Hong Kong and Saudi Arabia were included in this study, and their respective prevalence of physical inactivity were 15.3% and 40.0%. In addition, Dumith et al. pooled data gathered in three studies, including that of Bauman et al., to publish prevalence of physical inactivity by country, based on a larger sample from surveys on 300,000 adults aged 15 and above in 76 countries<sup>15</sup>). The prevalence of physical inactivity of Malaysia was included in this study, in addition to those of Hong Kong and Saudi Arabia. However, their study did not cover data on Singapore. All three studies on which the Dumith et al. study was based used the IPAQ questionnaire. Although exact numbers are unknown, as Dumith et al. presented data on the prevalence of physical inactivity of each country in the form of graphs, we can visually estimate that the approximate prevalence of physical inactivity of each country for both genders is 15%, 20% and 41% for Hong Kong, Malaysia, and Saudi Arabia, respectively. The disparity between their research results and the results as published by each country was 8.2% (23.2% – 15.0%), 15.7% (35.7% – 20.0%) and 19.3% (60.3% – 41.0%) for Hong Kong, Malaysia and Saudi Arabia, respectively. The prevalence of physical inactivity of these countries from the results of Dumith et al. can be ordered from lowest to highest in the order of Hong Kong, Malaysia and Saudi Arabia. This is the same as the corresponding order from results of the survey published by each country. Also, each value is lower than the results of the survey on physical inactivity taken by each country. This difference could be explained by the fact that data used by the Dumith et al. study was taken approximately 10 years earlier compared to the data

surveyed by the countries, which could explain that the prevalence of physical inactivity increased over the 10-year period.

In terms of prevalence of physical inactivity of each country by gender. There were differences between the questionnaires of each country, and the domain treated is different depending on the questionnaire, therefore leading to possible overestimation or underestimation of the effect of gender on physical inactivity. Nonetheless, the same questionnaire is used within countries, so the comparison of the effects of gender differences in the physical inactivity states of each country should be feasible to a certain extent.

Our attempt to search for physical activity guidelines in English on the Internet produced results from only six countries. We imagine that there are many more countries that have produced similar physical activity guidelines, either as per WHO recommendations, or as part of country-specific health measures, but the need to produce English versions of documents on such domestic measures is likely very low. Perhaps, there are several more important public health issues besides physical inactivity among some Asian countries. However, access to other countries' physical activity guidelines can be a very convenient tool in writing new national physical activity guidelines, or in making revisions to older versions. The publication of English versions of each country's physical activity guidelines and sharing of information would, therefore, lead to further improvement of each country's physical activity guidelines.

This report compared physical inactivity by country, as well as aggregated data stratified by gender and age as part of a preliminary ecological study. We also sought to compare the relationship between physical inactivity and overweight/obese prevalence by country. As lifestyle variance is characteristic to each country, such correlative studies by region may provide information to suggest various causal relationships pertinent to physical inactivity and health. However, before starting such comparative research, it is essential to assure that physical inactivity or activity is being surveyed using the same questionnaire. It is also ideal that physical activity or inactivity is surveyed using a common questionnaire to evaluate whether physical activity guidelines created by each country

contributes to encouraging physical activity. It is normal for each country to have different information needs, so conducting their original surveys should not be denied; however, it is ideal to use survey methods that assure comparability on minimally required items at an international level.

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【資 料】

## アジアにおける成人の身体活動基準と 身体不活動状況の国際比較

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### 要 旨

**目的:**本レポートは2つの目的をもって作成された。1つはアジア各国における身体活動ガイドラインの比較である。そしてもう1つはアジアにおける各国の身体活動調査の方法およびその結果の比較である。

**方法:**アジアにおける身体活動ガイドラインおよび身体活動調査の方法および結果について、Google Search, Google Scholar, MEDLINE, ELSEVIER, BioMed, BMC Public Health search を利用してアジア全体 (n=51) を対象に検索した。

**結果:**インターネットを用いた調査の結果、英語で記載した身体活動ガイドラインおよび身体活動調査の方法や結果を入手できた国は6か国であった(香港, マレーシア, シンガポール, サウジアラビア, 韓国, 日本)。身体活動ガイドラインについては、多くの国がWHOの推奨する身体活動ガイドライン, すなわち、「中強度の有酸素性身体活動を週150分もしくは高強度の有酸素性身体活動を週75分実施することを推奨」と類似していた。身体活動調査における身体活動の定義についても多くの国がWHOの定義, すなわち、「以下の基準に1つでも適合すること, ①週に3日以上, 1日当たり少なくとも20分の高強度の身体活動を実施, ②週に5日以上, 1日当たり少なくとも30分以上の中強度の身体活動もしくは歩行を実施, ③週に5日以上, 歩行や中高度の身体活動を1週間当たり600 MET-min 以上になるように実施」と類似した定義を採用していた。

**結論:**各国の情報を共有し, より良い身体活動ガイドラインを作成していくためにも, 多くの国において身体活動ガイドラインの英語版が公表されることが望まれる。更に, 最低限の項目については国際的に比較可能な調査が実施されることが望ましいと考えられる。

**Key words:** 身体活動, 身体不活動, GPAQ, IPAQ, 国際比較

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