

Validity and Reliability of the Marathi Translation of the International Physical Activity Questionnaire (IPAQ) in rural Area in Maharashtra

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Abstract

The International Physical Activity Questionnaire is known as a validated tool to measure physical activity all across the world. The questionnaire has been translated and validated in many languages however there exists no Marathi translated version of this questionnaire till date. Hence the purpose of this study was to translate the IPAQ-SF into Marathi language and to check the validity and reliability of the translated Marathi IPAQ.

A simple random sampling of 100 healthy individuals from Dr. A.P.J. Abdul Kalam College of Physiotherapy, PIMS, Loni. The participants included were between age group of 18-65 years and were screened according to inclusion and exclusion criteria. The participants were asked to take the IPAQ Marathi. Responses were changed to metabolic equivalent task minutes per week. The validation was done using the uniaxial accelerometer watch.

The data regarding the time spent doing vigorous, moderate and light activities done by the participants was collected with the help of Misfit smartphone application. The correlation between the total amount of time spent and the total IPAQ score was seen to be highly significant. (Pearson's correlation coefficient, $p=0.65$) and the reliability was found to be good. (Cronbach's alpha $r=0.7$)

The translated Marathi version of the IPAQ showed acceptable validity and reliability for the assessment of physical activity among rural area population of Maharashtra.

Keywords: Accelerometer watch, International Physical Activity Questionnaire, physical activity, sedentary lifestyle.

Introduction

In terms of definition physical activity is often outlined as any bodily movement performed by the skeletal muscles which requires energy expenditure, this includes activities done while working, doing household work, playing a sport or during travelling.^[1]

The term "physical activity" is often confused with the term "exercise", while exercise is a subdivision of physical activity which is planned, repetitive and aims to improve the one or more than one physical components. Beyond these planned exercise protocols, any other physical activity that is done during travelling or as a

individual's work, also shows health benefits.^[2]

Sedentary lifestyle is an issue of great concern because of its deleterious health consequences in developed as well as developing countries. It is associated with limited physical activity, prolonged sitting at work, in cars, at religious places, work sites, schools, homes and public places have been restricted in ways that minimize human movement and muscular activities. People sit more and move less. Compared to earlier days, demand of physically active lifestyle has drastically changed to reduced physical activities which brings the mankind to the greater risk to develop various

health hazards such as hypertension, obesity, various types of cancers and many cardiac conditions.^[3]

Sedentary lifestyle and reduced physical activity are now a leading cause for global mortality. The high-risk factor is adding burden of noncommunicable disorders and is affecting the overall health worldwide. According to a WHO report it is estimated that physical inactivity causes around 6% of the burden of disease from coronary heart disease, 7% of type 2 diabetes, 10% of breast cancer, and 10% of colon cancer. Insufficiently active individuals show 20% to 30% high risk of death compared to physically active individuals. A total of 56 million deaths happened worldwide during 2012. Out of this, 38 million were due to NCDs, principally cardiovascular diseases, cancer and chronic respiratory diseases.^[4]

Prevention of diseases is considered as the best strategy especially in developing and under developed countries, where the disease burden is very high and the cost of secondary and tertiary health care are unreachable to most of the population. Many studies have shown that increase in physical activity decreases the incidence of cardiovascular diseases, type 2 diabetes, stroke, and improves psychological wellbeing.^[5] Encouraging physical activity plays an important role in reducing the burden of Non-Communicable Diseases (NCDs). In 2013, Global NCD Action Plan 2013-2020 was endorsed in World Health Assembly, to promote healthy diets and physical activity, and to attain nine voluntary global targets for NCDs including ones on diet and physical activity to be achieved by 2025.^[6]

In research studies, there are many methods that can be followed for data collection. These methods can range from traditional, simple methods such as face-to-face interviews to more complex methods such as document and record analysis. The commonly used data collection methods are Interviews, Questionnaires and surveys, Oral history, documents and records, Observations and Focus groups. Interviews are considered to be expensive data collection tool due various factors. Observation involves collecting the information without asking the subject any questions. This can further lead to bias as this method is more subjective. Documents and records are can be considered as incomplete data sources as the researcher himself has less control over the result.

The researcher takes data from the already existing information. However, this method is inexpensive. Focus groups consist of showing a presentation and then discuss the content before answering the questions. Focus group generally use open-ended questions and therefore ground the research in a certain state of mind, eradicating external interference. Oral history is basically any research related to a particular phenomenon which is mainly based on collecting the information, recording, preservation and interpretation totally based on the information collected from the people who were actually involved in that particular event.^[7] In research studies, questionnaires are the most commonly used instruments to measure physical activity (PA), because of their low cost, simplicity and briefness. Many developing countries such as India don't have enough data on physical in activity.^[8]

The ability to measure physical activity behaviour is useful, not only to understand the association between physical activity and health, but also for many other reasons, such as to monitor secular trends in behaviour and to evaluate the effectiveness of interventions and programs. The accelerometer is a widely used tool to measure the physical activity in the form of step counts, calories and the distance covered by the person. The method is effective and accurate to collect data regarding physical activity. Although there are certain limitations while using it such as These challenges include a lack of understanding about exactly how a monitor functions, how to select the appropriate instrument, how to interpret accelerometer data, and how to manipulate and analyse the data produced by accelerometer output.^[9]

The world health organization made the Global physical activity questionnaire as an NCD risk factor surveillance. The questionnaire asks questions about the time spent by an individual doing day to day activities while travelling, at work, work done as a part of recreational activities and sedentary behaviour questions ask about the time spent while sitting. Similarly, physical activity scale for elderly (PASE) was created by New England research institute in 1991 for the individuals above 65 years of age to measure the physical activity as well as to check the effectiveness of the exercise intervention.^[10]

In 1997, a group of public health and physical activity researchers from 16 countries, with support of the World Health Organization (WHO) and the US Centers for Disease Control and Prevention (CDC), gathered in Geneva, Switzerland, to identify a common method to assess physical activity for the purpose of population surveillance.^[11] The outcome of the meeting was the development of the International Physical Activity Questionnaire (IPAQ), as an instrument for cross-national monitoring of physical activity. The IPAQ has then been examined for validity and reliability in several populations and international studies are deemed acceptable to use the IPAQ in physical activity research and surveillance activities.^[11-16]

There are two versions of the IPAQ (long and short forms). In each version, there are two formats: self-administered and telephone or face-to-face interview. Although the face-to-face interviews are often used by the researchers because they allow for more in-depth data collection and comprehensive understanding.

The questions will ask the people about the time they spent being physically active in the last 7 days. Such as, the time taken by the individual to perform vigorous physical activities which take maximum physical efforts to perform and make them breath harder than normal. The questionnaire asks about time taken to perform activities which take moderate physical efforts and make them breathe somewhat hard. Lastly the questionnaire asks about the time spent by the person in sitting. This is done to measure and assesses the types of intensity of physical activity and sitting time that people do as part of their daily lives are considered to estimate total physical activity in MET- min/week and time the individual spent sitting.

Although the results from the former studies are promising, however there is no available Marathi-language version which is culturally adapted and validated for Indian habits and lifestyle, especially in Rural areas in Maharashtra. Most of the population residing in rural areas of Maharashtra speaks Marathi language in day to day life. It is difficult for the people from rural areas to understand English, let alone speak the language. Hence the IPAQ will be translated to Marathi-language first and then assessment will be done by taking samples from the Indian population to check

for the validity and reliability of the questionnaire. The questionnaire was translated by following the guidelines given by the authors which includes forward-backward translation to eliminate errors.

Method

International Physical Activity Questionnaire was translated into Marathi from English using forward-backward-forward translation method using the instructions given in the International Physical Activity Questionnaire manual for reliability and validity. Two independent bilinguals translated the questions into Marathi, and subsequently the preliminary version was back translated into English following careful cultural adaptation. Then a third bilingual translator provided a final version.

All the patients referred to Physiotherapy Department were screened according to Inclusion and exclusion criteria. All the participants were briefed about the purpose and procedure of study and written consent form were obtained from the participants. Initially the participants were asked to take the IPAQ-SF (IPAQ- Short form) and IPAQ-M (IPAQ- Marathi) questionnaires in order to check the correlation between two versions. The participants were provided with the accelerometer watches which they had to wear for a week. All the activities were monitored through the wrist worn accelerometer with the help of a smartphone application for a period of a week and data was collected. After data collection participants were again asked to take the IPAQ-M on the 8th day to check the reliability. The data was analysed by using appropriate statistical test to check if there is correlation between the scores obtained from the two questionnaires by the participants.

Result Interpretation

TABLE NO. 1: Demographic Profile of all participants

Demographic characteristics	
AGE	18-65 years
GENDER	Males & Females
MALES	49
FEMALES	51

Result No.1: The above diagram shows that there were 100 participants in which 51% were female and 49% were male.

Table No.2: TABULAR REPRESENTATION OF AGE GROUP

AGE GROUP	AGE GROUP (%)
18-30	63
31-50	28
51-65	9

Result No. 2: 18-30 age group was the predominant age group which participated in this study.

Results and Discussion

There were 100 participants in which 51% were female and 49% were male. The study shows that 18-30 age group was the predominant age group which participated in this study. By using appropriate statistical analysis methods, we found that the values among IPAQ-SF and IPAQ-M showed positive correlation. The reliability of the questionnaire was also found to be good.

To our knowledge this is the first study done to check the validity and reliability of Marathi translation of International Physical Activity Questionnaire. There are very few validated questionnaires present to assess the amount of physical activity an individual is performing. Physical activity has been shown to reduce the morbidity rate and increase the quality of life. International physical activity questionnaire is short self-administered questionnaire which has been used widely all over the world to assess the physical activity however there is no Marathi translation available. Hence the questionnaire was translated into the Marathi language following the guidelines given by the respective authors. The participants were asked to take the IPAQ-M short form questionnaire and were asked to use the Misfit accelerometer watch for a week. This way the data was collected through the smartphone application

In this study, the IPAQ-M short form was validated against uni-axial accelerometer measurement. The data regarding the time spent doing vigorous, moderate and light activities done by the participants was collected

with the help of Misfit smartphone application. The correlation between the total amount of time spent and the total IPAQ score was seen to be moderately significant. (Pearson's correlation coefficient, $p=0.65$) and the reliability was found to be acceptable as well. (Cronbach's alpha $r=0.7$) The results indicated that Marathi version IPAQ-SF had good acceptance properties for assessing physical activities in healthy individuals.

Similar study was done by et al. Min Young Chun in Seoul, Korea where he studied the validity and reliability of Korean version of IPAQ in elderly people. Over 55 participants over 65 years of age were selected to administer Korean IPAQ version and were given uniaxial accelerometer watches as a measure for validation of the questionnaire. The test-retest method was performed over a two-week interval to examine the reliability of the IPAQ. They found that more physically active by the IPAQ short form, the higher the measured value of the accelerometer ($P < 0.001$). Pearson's correlation coefficient was 0.43 for the correlation between the results of two measurements. The validity of the IPAQ short form was proven, but the reliability was found to be low. Health conditions in the elderly could have been a factor that affected the reliability. Nevertheless, the Korean IPAQ short form seems to show good validity and reliability and can be used as tool to measure physical activity.^[17]

Conclusion

In conclusion, the translated IPAQ-M shows acceptable validity and reliability. Nonetheless the IPAQ-M can be used to measure the physical activity level in rural population of Maharashtra, India.

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Conflict of Interest- Nil

References

1. Caspersen CJ, Powell KE, Christenson GM. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public*

health rep. 1985 Mar 1;100(2):126-31.

3. Inyang DM, Stella OO. Sedentary lifestyle: health implications. *IOSR Journal of Nursing and Health Science* (IOSR-JNHS). e-ISSN: 2320-1959.p-ISSN: 2320-1940 Volume 4, Issue 2 Ver. I (Mar.-Apr. 2015), PP 20-25
4. Physical activity [Internet]. Who.int. 2019 [cited 23 February 2018] Available <https://www.who.int/news-room/fact-sheets/detail/physical-activity>
5. Buttar HS, Li T, Ravi N. Prevention of cardiovascular diseases: Role of exercise, dietary interventions, obesity and smoking cessation. *Experimental & clinical cardiology*. 2005;10(4):229.
6. WHO: Diet and physical activity: A public health priority Geneva. Available from: <http://www.who.int/dietphysicalactivity/background/en/>
7. Ainsworth Quentin (2019, December 24). Data Collection Methods. Retrieved from <https://www.jotform.com/data-collection-methods/>
8. Ga'lvez Vargas R, Sierra Lo'pez A, Sae'nz Gonza'lez MC, editors. Pie'drola Gil. *Medicina Preventiva y Salud Pu' blica*. Barcelona: Masson; 2000. pp. 935-43. 10 ed.
9. Ward DS, Evenson KR, Vaughn A, Rodgers AB, Troiano RP. Accelerometer use in physical activity: best practices and research recommendations. *Medicine & Science in Sports & Exercise*. 2005 Nov 1;37(11):S582-8.
10. Armstrong T, Bull F. Development of the world health organization global physical activity questionnaire (GPAQ). *Journal of Public Health*. 2006 Apr 1;14(2):66-70.
11. Craig CL, Marshall AL, Sjöström M, Bauman AE, Booth ML, Ainsworth BE, Pratt M, Ekelund U, Yngve A, Sallis JF, Oja Med Sci Sports Exerc. 2003 Aug; 35(8):1381-95
12. Craig CL, Marshall AL, Sjostrom M, et al. International physical activity questionnaire: 12-country reliability and validity. *Med Sci Sports Exerc*. 2003;35:1381-95.
13. Deng HB, Macfarlane DJ, Thomas GN, et al. Reliability and validity of the IPAQ-Chinese: The Guangzhou Biobank Cohort Study. *Med Sci Sports Exerc*. 2008;40:303-7.
14. Ekelund U, Sepp H, Brage S, et al. Criterion-related validity of the last 7-day, short form of the International Physical Activity Questionnaire in Swedish adults. *Public Health Nutr*. 2006;9:258-65.
15. Hagströmer M, Oja P, Sjöström M. The International Physical Activity Questionnaire (IPAQ): a study of concurrent and construct validity. *Public Health Nutr*. 2006;9:755-62.
16. kurtze n, rangul v, hustvedt be, flanders wd. reliability and validity of self-reported physical activity in the nord-trøndelag health study (hunt 2) *eur j epidemiol*. 2007;22:379-387.
17. Chun MY. Validity and reliability of Korean version of international physical activity questionnaire short form in the elderly. *Korean journal of family medicine*. 2012 May;33(3):144.