

Construction and Development of Physical Activity Questionnaire for Adolescents

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ABSTRACT

Physical activity (PA) is an important health behavior. Among children and adolescents, PA has a significant impact on cardiovascular, bone, and metabolic health, improving fitness, weight status, and sleep. Besides physical health benefits, there is increasing evidence on the cognitive, psychological, and social benefits of PA. Despite all the health benefits of PA, most adolescents worldwide are physically inactive. The purpose of the present study was to construct and develop an instrument by which the last seven days physical activity of adolescents could be measured. The researchers have developed a Likert style questionnaire which is comprising four domains i) Physical Activity at Work (PAW), ii) Physical Activity at Transport from and to places (PAT), iii) Physical Activity at Leisure Time including Active Recreational (PALTAR), and iv) Sedentary Behavior (SB). There were 98 items constructed in four domains. The population of the study was government and private higher secondary school students from the Jammu division of union territory of Jammu & Kashmir. The sample had been drawn from thirty one (31) government and private higher secondary schools of Jammu division. To collect the data from the participants, researchers had visited in the field (Pir-Panjal region, District Jammu and Reasi) to conducted the survey. The age group of the participants was 12-18 years abled male and female voluntarily took part in the research survey. The total participants were eight hundred (800) in which four hundred (400) male and four hundred (400) were female participants. The researchers had entered the data in the Excel sheet and applied factor analysis through Statistical Package of Social Sciences (SPSS) version 27 to reduce the developed questionnaire's items from 98 to 65 with four domains.

Key Words: Construction, Physical Activity, Questionnaire, Higher Secondary School, Jammu Division, Adolescents

Introduction

Physical activity (PA) is an important health behaviour. Among children and adolescents, PA has a significant impact on cardiovascular, bone, and metabolic health, improving fitness, weight status, and sleep. Besides physical health benefits, there is increasing evidence on the cognitive, psychological, and social benefits of PA. Despite all the health benefits of PA, most adolescents worldwide are physically inactive. Indeed, physical inactivity is a significant issue among children and adolescents, and it has profound implications for public health (Chaput, J.-P., Willumsen, J., Bull, F., Chou, R., Ekelund, U., Firth, J., et al. 2020). The increasing prevalence of pediatric obesity is particularly alarming because it sets the stage for chronic health conditions that were once considered adult diseases, such as metabolic syndrome, type 2 diabetes, and hypertension. van Sluijs, E. M. F., Ekelund, U., Crochemore-Silva, I., Guthold, R., Ha, A., Lubans, D., Oyeyemi, A. L., Ding, D., & Katzmarzyk, P. T. (2021). This trend has been exacerbated by factors such as increased screen time, sedentary lifestyles, and changes in dietary habits.

Physical activity can enhance physical health by improving functional capacity, reducing the risk of various diseases, optimizing body composition, and aiding in weight management Hills, A. P., Andersen, L. B., & Byrne,

N. M. (2011). Additionally, research has consistently demonstrated that engaging in physical activity contributes to psychological well-being, such as improved mood and reduced symptoms of depression and anxiety (Biddle, S. J., Ciacconni, S., Thomas, G., & Vergeer, I. 2019).

These studies provide a strong foundation to support the claim that physical activity is essential for both physical and psychological health in adolescents, while also addressing the growing public health issue of physical inactivity and pediatric obesity.

Adolescence, defined as the period between ages 10 and 19, is a critical phase of development bridging childhood and adulthood. The World Health Organization, (2022), emphasizes that this stage is pivotal for establishing lifelong habits, particularly those related to physical activity. During adolescence, the body and mind are highly responsive, adapting quickly to physical and psychological changes. These changes not only shape physical health but also influence how adolescents think, make decisions, and interact with their surroundings. Consequently, fostering healthy behaviors during this time is essential for overall well-being and future quality of life Sawyer, S. M., Azzopardi, P. S., Wickremaratne, D., & Patton, G. C. (2018).

The numerous physical, sexual, intellectual, social, and emotional changes that occur at the time of adolescence, it also brings stress, tension and anxiety for both children and their care giver. There is need to understand them and push them towards good and healthy habits throughout adolescence (10-19) till early adulthood (**Brittany Allen, & Helen Waterman**, 2019).

Physical activity (PA) during childhood and adolescence plays a key role in reducing the risk of non-communicable diseases. However, research has shown that, despite knowing the benefits of PA, many adolescents have reduced their activity levels over time. Accurately measuring PA is crucial for conducting research and collecting data. Self-report questionnaires are commonly used in large studies because they are easy to administer, cost-effective, and allow participants to provide context about their PA. While objective measures are more accurate in estimating PA, they don't capture the full context and can be difficult to use with young populations. Despite their limitations, self-report questionnaires remain valuable, and efforts to make them more accurate are ongoing. In this study, researchers developed a new questionnaire with 98 items divided into four main areas.

Methodology

The aim of this part of the study was to develop a scale for measuring the physical activities of last seven days of the adolescents in Jammu division (J & K). In this phase, researchers went through literature review and constructed a questionnaire consisting of ninety eight (98) items which is mainly divided into four (04) domains I) physical activity at work (PAW), II) physical activity at transport (PAT), III) physical activity at leisure time including Active Recreational (PALTAR), and IV) sedentary behavior (SB). The questionnaire has been set on the format of Likert scale, each question has provided five (05) options which were distributed to whole week (seven '07' days) as follows:

- 1) Always = 07 days
- 2) Often = 05 to 06 days
- 3) Sometime = 03 to 04 days
- 4) Rarely = 01 to 02 days
- 5) Never = 00 day

Sampling

The population for this study have been chosen from the Jammu division (Poonch, Rajouri twin districts popularly known as Pir-Panjal region, including district Jammu and Reasi) of union territory, Jammu & Kashmir. To collect the data from the participants researchers have visited in the field (Pir-Panjal region, district Jammu and Reasi) to conducted a survey. The researchers have visited in forty one (41) government and private higher secondary schools but among them ten (10), five (05) from each government and private higher secondary schools not allowed to collect the data from their respective schools. The sample has been drawn from thirty one (31) government and private higher secondary schools of Jammu division, among them only four (04) were private higher secondary schools, rest of twenty seven were government higher secondary schools. Before conducting survey, researchers had took permission against the letter provided from the department of physical education, Aligarh Muslim University, Aligarh. The researcher allowed from the head of the concerned institute on prescribed format. The age group of the participants was 12-18 years abled male and female from both gender they were eight hundred (800) four hundred (400) from each gender (male and female) voluntarily took part in the research survey. To collect the data researchers had directly interacted to the participants and explain all necessary instructions including researcher asked to the participants that you have to recall last seven (07) days your physical activities which you have to claim in questionnaire, researcher has done all before distributing questionnaire to the participants. Researcher had conveyed the purpose of the survey to the participants and further

more researcher clarified to the participants that it is just a research purpose survey so you may or may not take part in the survey, then researcher arranged to the participants in proper sitting position and had distributed questionnaire to the participants. The researcher was observing and helping to the participants by all means. Researcher had constructed the questionnaire in English language but in front of participants researcher had explain each and every question in regional languages for instance Urdu, Gojri, Pahari and Dogri languages as per the need to make the questionnaire easy to understand to the participants.

Results & Discussion

The present study is the pre phase of the corresponding author's theses. This part of the investigation is consisting of collected data analysis and interpretation in which all the four (4) domains of the constructed physical activity questionnaire of adolescents from 12-18, individually analyzed.

The researchers have entered the data in the Excel sheet and applied factor analysis through Statistical Package of Social Sciences (SPSS) version 27 to reduce the developed questionnaire's items from 98 to 65 with four domains.

Table 1. No. of items representing domains of Physical Activity Questionnaire

Dimensions	Positively scoring items	Negatively scoring items	No. of Items
1. Physical Activity at Work (including house hold work)	1, 3, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17	-	12
2. Physical Activity at Transport to and from places	19, 21, 22, 23, 24, 25, 26	-	7
3. Physical Activity at Leisure Time (including recreational and sports activities)	27, 28, 29, 30, 31, 32, 33, 37, 38, 39, 40, 43, 44, 45, 46, 48, 49, 52, 53, 55, 56, 57, 62, 63, 64, 65, 68, 70, 71, 73, 77, 78, 79, 80, 82, 83, 84, 85, 86	-	39
4. Sedentary Behaviour/Lifestyle		87, 88, 90, 91, 94, 97, 98	7
Physical Activity Questionnaire	58	7	65

In the table 1, researchers have shown the representation of the items in four domains of the Physical Activity Questionnaire as follows:

- Physical Activity at Work.** In this domain researchers had developed eighteen (18) items which have covered all the house hold work causes which the breath rise by 20 to 30% from its resting or normal level. After applying factor analysis six items have been removed (2, 4, 5, 6, 12, 18). At presently the remaining twelve items are (1, 3, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17).
- Physical Activity at Transport (to and from places).** In the second domain researchers had developed eight items related with physical activities which become medium of transport from one place to another in which heart beat rise by 20 to 30% from its normal level. After using factor analysis one item (item no: 20) had been removed, rest of the seven (7) items are (19, 21, 22, 23, 24, 25, 26)
- Physical Activity at Leisure Time (including recreational and sports activities).** In the third domain of the constructed physical activity questionnaire, researchers had constructed sixty (60) items related with leisure time activities including all types of major sports and active recreational activities due to which the breath rise by 20 to 30% from its normal level. From this domain twenty one (21) items had been removed after applying factor analysis, the deleted items are (34, 35, 36, 41, 42, 47, 50, 51, 54, 58, 59, 60, 61, 66, 67, 69, 72, 74, 75, 76, 81.). Remaining thirty nine (39) items are (27, 28, 29, 30, 31, 32, 33, 37, 38, 39, 40, 43, 44, 45, 46, 48, 49, 52, 53, 55, 56, 57, 62, 63, 64, 65, 68, 70, 71, 73, 77, 78, 79, 80, 82, 83, 84, 85, 86).

4. **Sedentary Behaviour/Lifestyle.** This is the fourth and last domain of the physical activity questionnaire in which researchers had twelve (12) items constructed but after using factor analysis reduced to seven (7) items. The items which have been removed are (89, 92, 93, 95, 96) and remaining seven (7) items are (87, 88, 90, 91, 94, 97, 98).

The further work is still going on to make the questionnaire standardized by evaluating reliability, validity and developing norms.

Discussion

The accurate measurement of adolescent physical activity (PA) is critical for understanding health behaviors and identifying risk factors associated with physical inactivity. While the International Physical Activity Questionnaire (IPAQ) has been widely used to assess PA, its application in the Indian context poses significant challenges. The IPAQ, originally designed for international use, may not fully account for the unique demographic, geographical, cultural, and ethnic factors that influence physical activity patterns in Indian adolescents. As a result, its utility in this population is limited, necessitating the development of more context-specific tools (Satija et al., 2018; Bhawra et al., 2023).

Previous research highlights the variability in adolescent PA due to differences in socio-cultural and geographical conditions across the world. Satija et al. (2018) conducted a qualitative study to identify barriers and enablers to PA among Indian adolescents, revealing significant discrepancies in PA engagement compared to global norms. These findings align with the broader literature, which emphasizes the influence of environmental factors on PA behaviors. For instance, van Sluijs et al. (2021) underscore the role of providing supportive environments and opportunities to encourage PA, particularly in resource-limited settings.

The need for a localized approach to PA measurement is further supported by the recent development of a new PA questionnaire in India, which takes into consideration the diverse factors affecting adolescent activity. Bhawra et al. (2023) highlight the importance of culturally tailored instruments in their 2022 India report card on adolescent PA. This questionnaire, designed to address local socio-cultural dynamics, offers a more accurate reflection of PA behaviors in Indian youth compared to the IPAQ.

Moreover, research by Dong et al. (2023) underscores the importance of considering additional mediating factors, such as self-efficacy and sleep duration, when developing models to promote adolescent physical and mental health. This aligns with the broader consensus that contextually relevant research is essential for constructing effective interventions.

Summary

The measurement of adolescent physical activity over seven days is a complex issue, especially in India, where the International Physical Activity Questionnaire (IPAQ) may not fully capture the cultural, geographical, and demographic variations that influence activity levels. Studies like those by Satija et al. (2018) and Bhawra et al. (2023) emphasize the need for a more context-specific tool tailored to Indian adolescents. Moreover, research by van Sluijs et al. (2021) highlights the global diversity in adolescent physical activity patterns and stresses the importance of providing supportive environments to encourage active lifestyles. These findings underscore the need for localized assessments, such as the newly developed questionnaires based on extensive research, which could better suit the unique characteristics of Indian youth.

Researchers also concluded that while the IPAQ has been a valuable tool in global PA surveillance, its limitations in the Indian context highlight the need for culturally and geographically specific instruments. Future research should continue to refine these tools to ensure they accurately capture PA behaviors, thus enabling more effective public health interventions for Indian adolescents.

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