



Validity and reliability of the Indonesian version of Physical Activity Questionnaire for adolescents (PAQ-A) and older children (PAQ-C)

Fitria Dwi Andriyani¹*, Eka Novita Indra², Aprida Agung Priambadha³, Malebogo Monnaatsie⁴

¹ Department of Sports Education, Faculty of Sport and Health Sciences, Yogyakarta State University, 55281, Indonesia

² Department of Sports Science, Faculty of Sport and Health Sciences, Yogyakarta State University, 55281, Indonesia

³ Department of Primary Teacher Education, Faculty of Teacher Training and Education, Ahmad Dahlan University, 55166, Indonesia

⁴ Department of Sport Science, University of Botswana, 4775, Botswana

*Corresponding Author. Email: fitria.dwi.andriyani@uny.ac.id

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Abstract: Existing study examining the validity and reliability of the Physical Activity Questionnaire for adolescents (PAQ-A) in Indonesian youth did not explain whether it conducted cross-cultural adaptation to the questionnaire or not. Additionally, the authors did not publish the Indonesian version of the questionnaire. None of the previous studies investigated the validity and reliability of the Indonesian version of PAQ-C. This study aimed to conduct a cross-cultural adaptation of PAQ-A and PAQ-C into the Indonesian language (Bahasa Indonesia) and to check its validity and reliability. This research employed a cross-sectional design. Two groups were recruited: grade 5 students (n=58, 10-12 years old) and grade 7 students (n=61, 13-15 years old). The concurrent validity was verified against the Indonesia Physical Fitness Test (IPFT). We also investigated the item validity and inter-item correlations. The reliability was tested by using the Cronbach Alpha technique. Results showed that the concurrent validity of the Indonesian version of PAQ-A and PAQ-C against IPFT are low ($\rho = 0.224$ and $\rho = 0.165$, consecutively) ($p > 0.05$). The item validity of the Indonesian version of PAQ-A ranged between 0.338 and 0.737; while for PAQ-C ranged between 0.329 – 0.818. Inter-item correlation for PAQ-A and PAQ-C ranged from -0.019 to 0.569 and 0.000 to 0.704, respectively. The reliability of the Indonesian version of PAQ-A and PAQ-C is acceptable ($\alpha = 0.740$ and $\alpha = 0.705 - 0.712$, consecutively). In conclusion, we found that the item validity of PAQ-A and PAQ-C were at a moderate level. The validity of the PAQ-A and PAQ-C were lower when they were checked against a physical fitness test, comparable to previous studies with device-based measurements. The Indonesian version of PAQ-A and PAQ-C have a moderate level of reliability. Our results suggest that the use of the questionnaires will be better complemented by other device-based measurements, such as accelerometers or pedometers.

Keywords: physical activity, questionnaire, Indonesia, youth, measurement

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INTRODUCTION

Obesity has become a global problem. Compared to data in 1975, obesity cases have increased by nearly tripled worldwide (WHO, 2021). In 2016, over 650 million adults (>18 years) were obese and over 340 million children and adolescents (5-19 years) were overweight or obese (WHO, 2021). The World Health Organization (WHO) stated that obesity in children is the most significant public health challenge of the 21st century (WHO, 2020). Children with overweight and obesity are at greater risk for noncommunicable diseases, such as cardiovascular diseases and diabetes (WHO, 2020). Hence, the prevention of childhood obesity needs more attention.

Supporting young people to do physical activity regularly by following the WHO guidelines is important so that they can derive health benefits from physical activity and prevent them from overweight and obese. Research shows that physical activity is positively correlated with favourable cardiorespiratory and muscular fitness, bone and cardiometabolic health, as well as adiposity (Chaput et al., 2020). Moreover, physical activity has also

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been linked with good mental health by decreasing the risk of depression and contributes positively to cognitive function and academic outcomes (Chaput et al., 2020).

The WHO suggest children and adolescents (5-17 years) do physical activity at least an average of 60 minutes per day of moderate-to-vigorous intensity across the week and perform vigorous aerobic activities, and muscle- and bone-strengthening activities at least 3 days per week (Bull et al., 2020). Other guidelines, such as in Canada and Australia, also emphasize youth doing several hours of both structured and unstructured light physical activity as part of a healthy 24-hour movement behaviour (Australia, 2021; Tremblay et al., 2016).

Measuring physical activity is important to evaluate the physical activity level in young people. By doing measurements, we can get information whether children have already fulfilled the physical activity guidelines or not. Self-report measurements, e.g., questionnaires, have become prominent tools to investigate physical activity behaviours (Guthold et al., 2020; Liangruenrom et al., 2018; Uddin et al., 2020). This type of measurement provides some practicality in collecting data from a large-scale number of participants (Barnett et al., 2018).

Previous literature showed that the Physical Activity Questionnaire for Older Children (PAQ-C) and Physical Activity Questionnaire for Adolescents (PAQ-A) by Kowalski et al. (1997) have a favourable validity and reliability in multiple countries, including Malaysia, Turkey, and Canada (Erdim et al., 2019; Voss et al., 2017; Zaki et al., 2016). A previous study in Indonesia has shown the validity and reliability of the Indonesian version of PAQ-A in Indonesian adolescents (Rahayu et al., 2022). However, the authors did not clarify whether they have conducted cross-cultural adaptation to the questionnaire or not. Additionally, they also did not publish the Indonesian version of the questionnaire. None of the previous studies investigated the validity and reliability of the Indonesian version of PAQ-C. Hence, the current study aimed to conduct a cross-cultural adaptation of PAQ-A and PAQ-C into the Indonesian language (Bahasa Indonesia) and to check its validity (concurrent validity, item validity, and inter-item correlation) and reliability.

METHODS

This research employed a cross-sectional design. The translations and cross-cultural adaptations of PAQ-A and PAQ-C from English into the Indonesian language (Bahasa Indonesia) were conducted by following guidelines by Epstein et al. (2015). The original version of the PAQ-A and PAQ-C manual can be found online (Kowalski et al., 2004). This study has complied with all relevant national regulations, and institutional policies following the tenets of the Helsinki Declaration, and has been approved by the Research Review Board, Faculty of Sport and Health Sciences, Yogyakarta State University.

Participants

There were two groups for this research. The first group consists of grade 5 students (n=58, 10-12 years) from an elementary school in an urban area (n=32) and a rural area (n=26). The second group included grade 7 students (n=61, 13-15 years) from a junior high school in an urban area (n=34) and a rural area (n=27). We used a non-probability sampling technique (purposive sampling) to recruit participants.

Measures

We measured height to the nearest 0.1 cm by using a wall-mounted stadiometer and measured body weight (light clothing but no shoes) to the nearest 0.1 kg by using a digital scale. We assessed the physical fitness of participants by conducting “Tes Kebugaran Jasmani Indonesia” or the Indonesian Physical Fitness Test (IPFT). The IPFT was implemented based on each age category; 10-12 years for elementary school students, and 13-15 years for junior high school students. The IPFT consists of five item tests: sprint (10-12 years: 40 meters (m); 13-15 years: 50 m), pull-up (60 seconds (s)), sit-up (10-12 years: 30 s; 13-15 years: 60 s), vertical jump, and medium distance running (10-12 years: 600 m; 13-15 years: 1000m) (Sepdanius et al., 2019). The total score of five item tests reflects the physical fitness level: 5-9 (very low), 10-13 (low), 14-17 (moderate), 18-21 (good), and 22-25 (very good) (Sepdanius et al., 2019). One week after the IPFT, participants were asked to complete the Indonesian version of PAQ-A for junior high school student participants and the Indonesian version of PAQ-C for elementary

school student participants. The PAQ (C) and PAQ(A) scores show the physical activity level and ranges from one to five. Kowalski et al. did not specify the classification of each score clearly (Kowalski et al., 2004), hence we categorised the scores as follow: 1 (very low), 2 (low), 3 (moderate), 4 (high), 5 (very high).

Data collection and analysis

This study used data that were collected in August 2017. Analysis was performed by using SPSS 23 for Windows. We conducted a Kolmogorov-Smirnov normality test before performing correlation analysis. We found that the distributions of the PAQ-A data of junior high school students and the IPFT data of elementary school students were not normal ($p < 0.05$), hence we used the Spearman Correlation test to analyze the data. The concurrent validity of PAQ-A and PAQ-C were checked by comparing the results from the questionnaires with the IPFT. We also investigated the item validity and inter-item correlation. Lastly, the reliability of the questionnaires was investigated by using the Cronbach Alpha technique.

RESULT AND DISCUSSION

Results

After conducting the translations and cross-cultural adaptations of PAQ-A and PAQ-C from English into the Indonesian language (Bahasa Indonesia) by following guidelines by Epstein et al. (2015), below are the Indonesian version of PAQ (C) and PAQ (A). The guidelines for scoring can be found in the original questionnaires (Kowalski et al., 2004). We classified the mean of the physical activity scores as follow: 1 (very low), 2 (low), 3 (moderate), 4 (high), 5 (very high).

Physical Activity Questionnaire for Older Children (PAQ-C)- Indonesian version
Kuesioner Aktivitas Fisik untuk Anak (± 8-14 tahun)

Nama : _____ Tanggal lahir : _____
 Jenis Kelamin : L / P Kelas : _____
 Berat Badan (kg) : _____ Tinggi Badan (cm) : _____

Kami ingin mengetahui tingkat aktivitas fisik kamu selama *7 hari terakhir* (dalam seminggu terakhir). Contoh aktivitas fisik adalah olahraga atau kegiatan lain yang membuat kamu berkeringat atau yang membuat kaki kamu merasa lelah, atau permainan yang membuat kamu bernapas dengan terengah-engah seperti permainan kucing-kucingan, lompat tali, berlari, memanjat, dan lain-lain.

Ingat:

1. Tidak ada jawaban yang benar dan salah – ini bukan tes.
2. Mohon menjawab semua pertanyaan dengan sejujur-jujurnya dan sebenar-benarnya – ini sangat penting.

1. Kegiatan fisik saat kamu senggang: Apakah kamu sudah melakukan kegiatan-kegiatan berikut ini selama *7 hari terakhir* (seminggu terakhir)? Jika iya, berapa kali? (Cukup centang satu lingkaran per baris)

	Tidak	1-2	3-4	5-6	7 x atau lebih
Lompat tali	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mendayung/bersampan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bermain sepatu roda	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bermain kucing-kucingan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jalan-jalan untuk berolahraga	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bersepeda	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Joging atau lari	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Senam Aerobik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Berenang	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kasti, Bisbol, Softbol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Menari	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Tidak	1-2	3-4	5-6	7 x atau lebih
Sepak bola	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Badminton	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bermain <i>skateboard</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Futsal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bermain hoki	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bola voli	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tenis lapangan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tenis meja	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bola basket	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beladiri (karate, silat, taekwondo)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lainnya:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Dalam 7 hari terakhir, selama jam pelajaran pendidikan jasmani (Penjas), seberapa sering kamu bergerak dengan sangat aktif (banyak bermain, berlari, melompat, melempar)? (Berilah tanda centang pada salah satu pilihan berikut)
 - Saya tidak ikut pelajaran Penjas
 - Hampir tidak pernah
 - Kadang
 - Cukup sering
 - Selalu
3. Dalam 7 hari terakhir, sebagian besar waktu *saat jam istirahat sekolah* kamu gunakan untuk melakukan kegiatan apa? (Berilah tanda centang pada salah satu pilihan berikut)
 - Duduk (mengobrol, membaca, mengerjakan tugas sekolah)
 - Berdiri atau jalan-jalan
 - Lari atau bermain sebentar
 - Lari atau bermain agak lama
 - Lari dan bermain selama sebagian besar jam istirahat
4. Dalam 7 hari terakhir, apa yang biasanya kamu lakukan *saat istirahat makan siang*? (Berilah tanda centang pada salah satu pilihan berikut)
 - Duduk (mengobrol, membaca, mengerjakan tugas sekolah)
 - Berdiri atau jalan-jalan
 - Lari atau bermain sebentar
 - Lari atau bermain agak lama
 - Lari dan bermain selama sebagian besar jam istirahat
5. Dalam 7 hari terakhir, berapa hari *setelah pulang sekolah* yang kamu gunakan untuk berolahraga atau melakukan permainan yang membuat kamu bergerak dengan sangat aktif? (Berilah tanda centang pada salah satu pilihan berikut.)
 - Tidak pernah
 - 1 kali selama seminggu terakhir
 - 2 atau 3 kali selama seminggu terakhir
 - 4 kali selama seminggu terakhir
 - 5 kali selama seminggu terakhir
6. Dalam 7 hari terakhir, berapa banyak waktu di *sore hari* yang kamu gunakan untuk berolahraga atau melakukan permainan yang membuat kamu bergerak dengan sangat aktif? (Berilah tanda centang pada salah satu pilihan berikut)
 - Tidak pernah
 - 1 kali selama seminggu terakhir
 - 2 atau 3 kali selama seminggu terakhir
 - 4 kali selama seminggu terakhir
 - 5 kali selama seminggu terakhir

7. Di akhir pekan selama seminggu terakhir, seberapa sering kamu berolahraga, atau melakukan permainan yang membuat kamu bergerak dengan sangat aktif? (Berilah tanda centang pada salah satu pilihan berikut.)
- Tidak pernah
- 1 kali
- 2 - 3 kali
- 4 - 5 kali
- 6 kali atau lebih

8. Mana *satu* dari pernyataan berikut yang paling menggambarkan kamu selama 7 hari terakhir? Bacalah dengan seksama *kelima* pernyataan sebelum memilih *satu* jawaban yang menggambarkan kamu.

- A. Saya sedikit melakukan aktivitas fisik untuk mengisi sebagian besar waktu luang saya
- B. Saya kadang-kadang (1 - 2 kali dalam seminggu terakhir) melakukan kegiatan fisik di waktu luang (misalnya berolahraga, lari, berenang, bersepeda, senam aerobik)
- C. Saya sering (3 - 4 kali dalam seminggu terakhir) melakukan kegiatan fisik di waktu luang
- D. Saya sangat sering (5 - 6 kali dalam seminggu terakhir) melakukan kegiatan fisik di waktu luang
- E. Saya sangat sering sekali (7 kali atau lebih dalam seminggu terakhir) melakukan kegiatan fisik di waktu luang

9. Berikan tanda centang seberapa sering kamu melakukan kegiatan fisik (seperti berolahraga, bermain, menari, atau kegiatan fisik lainnya) setiap harinya selama seminggu terakhir.

	Tidak Pernah	Sedikit	Cukup Sering	Sering	Sangat Sering
Senin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selasa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rabu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kamis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jumat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sabtu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Minggu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Apakah kamu sakit minggu lalu, atau apakah ada sesuatu yang membuat kamu tidak bisa melakukan aktivitas fisik seperti biasanya? (Pilih salah satu)

- Ya
- Tidak

Jika ya, apa yang menghalangi kamu?

Physical Activity Questionnaire for Adolescents (PAQ-A)- Indonesian version
Kuesioner Aktivitas Fisik untuk Remaja (\pm 14-19 tahun)

Nama : _____ Usia : _____
Jenis Kelamin : L / P Kelas : _____
Berat Badan (kg): _____ Tinggi Badan (cm): _____

Kami ingin mengetahui tingkat aktivitas fisik kamu selama 7 *hari terakhir* (dalam seminggu terakhir). Contoh aktivitas fisik adalah olahraga atau kegiatan lain yang membuat kamu berkeringat atau yang membuat kaki kamu merasa lelah, atau permainan yang membuat kamu bernapas dengan terengah-engah seperti permainan kucing-kucingan, lompat tali, berlari, memanjat, dan lain-lain.

Ingat:

1. Tidak ada jawaban yang benar dan salah – ini bukan tes.
2. Mohon menjawab semua pertanyaan dengan sejujur-jujurnya dan sebenar-benarnya – ini sangat penting.

-
1. Kegiatan fisik saat kamu senggang: Apakah kamu sudah melakukan kegiatan-kegiatan berikut selama 7 *hari terakhir* (seminggu terakhir)? Jika iya, berapa kali? (Cukup centang satu lingkaran per baris.)

	Tidak	1-2	3-4	5-6	7x atau lebih
Lompat tali	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mendayung/bersampan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bermain sepatu roda	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bermain kucing-kucingan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jalan-jalan untuk berolahraga	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bersepeda	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Joging atau lari	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Senam Aerobik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Berenang	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kasti, Bisbol, Softbol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Menari	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Futsal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Badminton	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bermain <i>skateboard</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sepak bola	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bermain hoki	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bola voli	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tenis lapangan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tenis meja	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bola basket	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beladiri (karate, silat, taekwondo)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lainnya:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Dalam 7 hari terakhir, selama jam pelajaran pendidikan jasmani (Penjas), seberapa sering kamu bergerak dengan sangat aktif (banyak bermain, berlari, melompat, melempar)? (Berilah tanda centang pada salah satu pilihan berikut)
 - Saya tidak ikut pelajaran Penjas
 - Hampir tidak pernah
 - Kadang
 - Cukup sering
 - Selalu
3. Dalam 7 hari terakhir, apa yang biasanya kamu lakukan *saat istirahat makan siang*? (Berilah tanda centang pada salah satu pilihan berikut)
 - Duduk (mengobrol, membaca, mengerjakan tugas sekolah)
 - Berdiri atau jalan-jalan
 - Lari atau bermain sebentar
 - Lari atau bermain agak lama
 - Lari dan bermain selama sebagian besar jam istirahat
4. Dalam 7 hari terakhir, berapa banyak hari *setelah pulang sekolah* yang kamu gunakan untuk berolahraga atau melakukan kegiatan dan permainan yang membuat kamu bergerak dengan sangat aktif? (Berilah tanda centang pada salah satu pilihan berikut)
 - Tidak pernah
 - 1 kali selama seminggu terakhir
 - 2 atau 3 kali selama seminggu terakhir
 - 4 kali selama seminggu terakhir
 - 5 kali selama seminggu terakhir
5. Dalam 7 hari terakhir, berapa banyak waktu di *sore hari* yang kamu gunakan untuk berolahraga atau melakukan kegiatan dan permainan yang membuat kamu bergerak dengan sangat aktif? (Berilah tanda centang pada salah satu pilihan berikut)

- Tidak pernah
- 1 kali selama seminggu terakhir
- 2 atau 3 kali selama seminggu terakhir
- 4 kali selama seminggu terakhir
- 5 kali selama seminggu terakhir
6. Di akhir pekan selama seminggu terakhir, seberapa sering kamu berolahraga atau melakukan kegiatan dan permainan yang membuat kamu bergerak dengan sangat aktif? (Berilah tanda centang pada salah satu pilihan berikut)
- Tidak pernah
- 1 kali
- 2 - 3 kali
- 4 - 5 kali
- 6 kali atau lebih
7. Mana satu dari pernyataan berikut yang paling menggambarkan kamu selama 7 hari terakhir? Baca *kelima* pernyataan sebelum memilih *satu* jawaban yang menggambarkan kamu.
- A. Saya sedikit melakukan aktivitas fisik untuk mengisi sebagian besar waktu luang saya
- B. Saya kadang-kadang (1 - 2 kali dalam seminggu terakhir) melakukan kegiatan fisik di waktu luang (misalnya berolahraga, lari, berenang, bersepeda, senam aerobik)
- C. Saya sering (3 - 4 kali dalam seminggu terakhir) melakukan kegiatan fisik di waktu luang
- D. Saya sangat sering (5 - 6 kali dalam seminggu terakhir) melakukan kegiatan fisik di waktu luang
- E. Saya sangat sering sekali (7 kali atau lebih dalam seminggu terakhir) melakukan kegiatan fisik di waktu luang
8. Tandai seberapa sering kamu melakukan kegiatan fisik (seperti berolahraga, bermain, menari, atau kegiatan fisik lainnya) setiap harinya selama seminggu terakhir.
- | | Tidak Pernah | Sedikit | Cukup Sering | Sering | Sangat Sering |
|--------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Senin | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Selasa | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rabu | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Kamis | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Jumat | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Sabtu | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Minggu | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
9. Apa kamu sakit minggu lalu, atau apakah ada yang menghalangi kamu sehingga kamu tidak melakukan aktivitas fisik seperti biasa? (Pilih salah satu.)
- Ya
- Tidak
- Jika ya, apa yang menghalangi kamu?

Table 1. Norm for PAQ-A and PAQ-C Scores

Score Mean	Category (Physical activity level)
1	Very low
2	Low
3	Moderate
4	High
5	Very high

Sample Characteristics

Table 2 describes the characteristics of sample in this study. Overall, the results of the IPFT showed that the fitness levels of students at elementary school, both in urban and rural areas, were low (mean (standard deviation (SD)): 10 (2.6) and 10 (2.1), respectively). Similar results were also shown for the fitness level of junior high school students in urban and rural areas (mean (SD): 10 (2.6) and 11 (3.1), consecutively). Data from PAQ-A showed that the physical activity levels of the junior high school students in urban and rural settings were low (mean (SD): 2 (0.6) and 2 (0.4), respectively). Meanwhile

data from PAQ-C showed that the physical activity levels of the elementary school students in urban and rural settings were at low and moderate levels (mean (SD): 2 (0.5) and 3 (0.6), respectively). Distributions of physical fitness and physical activity level in both elementary and junior high school participants are presented in Figure 1 and Figure 2.

Table 2. Sample Characteristics

Sample characteristics	Elementary school		Junior High School	
	Urban (n= 32) mean (SD)	Rural (n=26) mean (SD)	Urban (n=34) mean (SD)	Rural (n=27) mean (SD)
Gender (female/male)	17/15	11/15	21/13	14/13
Age (years)	10.3 (0.9)	10.4 (0.6)	13.3 (0.5)	13.6 (0.8)
Height (meter)	1.4 (0.1)	1.4 (0.1)	1.6 (0.1)	1.5 (0.1)
Weight (kg)	36.7 (9.3)	37 (11.3)	53 (14.7)	48 (12.2)
Body mass index	18.3 (3.7)	18.8 (4.6)	21.8 (5.3)	20.7 (4.2)
The Indonesia Physical Fitness Test	10 (2.6)	10 (2.1)	10 (2.6)	11 (3.1)
PAQ-A Scores				
Leisure physical activity			1 (0.5)	1 (0.3)
Physical Education			4 (0.8)	4 (0.5)
Lunch break			2 (1.1)	1 (0.5)
After school			2 (1.3)	2 (1.1)
Afternoon			2 (1.2)	3 (1.3)
Weekend			3 (1.0)	3 (0.6)
7-day physical activity			2 (1.2)	2 (1.0)
Daily physical activity			2 (0.8)	2 (0.6)
Mean of total physical activity			2 (0.6)	2 (0.4)
PAQ-C Scores				
Leisure physical activity	2 (0.3)	1 (0.6)		
Physical Education	4 (0.9)	4 (0.9)		
Recess	2 (1.0)	3 (0.7)		
Lunch break	2 (1.3)	N/A		
After school	2 (1.3)	3 (1.1)		
Afternoon	3 (0.9)	3 (1.4)		
Weekend	3 (1.0)	2 (1.2)		
7-day physical activity	2 (1.1)	2 (1.0)		
Daily physical activity	2 (0.8)	3 (0.7)		
Mean of total physical activity	2 (0.5)	3 (0.6)		

Validity of PAQ-A

Concurrent Validity of PAQ-A

Initially, we recruited 61 junior high school students to test the validity of PAQ-A. Data from 4 students were excluded from analysis due to incomplete data (e.g., participants did not attend the IPFT test), leaving data from 57 students for final analysis. We found that the correlation between the IPFT scores and the PAQ-A scores was 0.224, which means a low positive correlation, and that the correlation was not significant ($p > 0.05$).

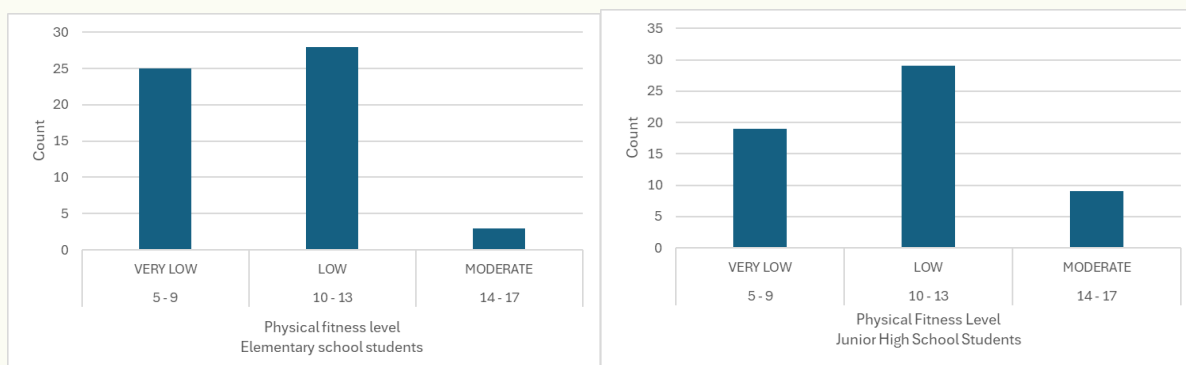


Figure 1. Physical fitness level of elementary and junior high school students

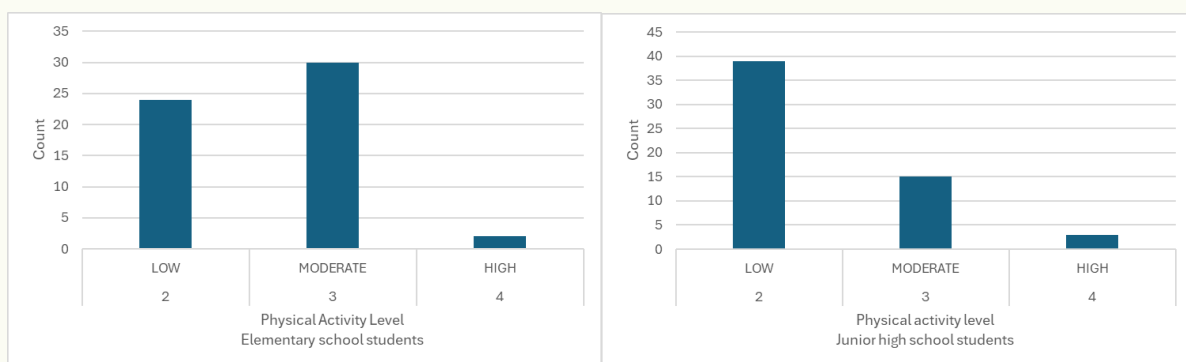


Figure 2. Physical activity level of elementary and junior high school students

Table 3. Item Validity and Inter-item Correlation of PAQ-A

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	TOTAL
Q1 Pearson Cor		.202	.142	.466**	.489**	.448**	.569**	.465**	.721**
Sig. (2-tailed)		.119	.274	.000	.000	.000	.000	.000	.000
Q2 Pearson Cor			.145	.147	.064	.203	.097	.043	.338**
Sig. (2-tailed)			.264	.260	.624	.116	.456	.742	.008
Q3 Pearson Cor				.122	-.019	.238	.114	.103	.369**
Sig. (2-tailed)				.347	.885	.065	.380	.430	.003
Q4 Pearson Cor					.470**	.249	.364**	.302*	.686**
Sig. (2-tailed)					.000	.053	.004	.018	.000
Q5 Pearson Cor						.409**	.546**	.394**	.730**
Sig. (2-tailed)						.001	.000	.002	.000
Q6 Pearson Cor							.371**	.525**	.668**
Sig. (2-tailed)							.003	.000	.000
Q7 Pearson Cor								.505**	.737**
Sig. (2-tailed)								.000	.000
Q8 Pearson Cor									.643**
Sig. (2-tailed)									.000

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Note: Q= Questionnaire item, Pearson Cor = Pearson Correlation

Item Validity and Inter-Item Correlation of PAQ-A

We checked the item validity of PAQ-A by correlating item scores with the total score (see Table 3). Responses from all 61 participants can be included in the item validity and inter-item correlation analysis. Overall, we found that the correlations between items and total score (item validity) were higher than the correlations between items (inter-item correlation). Results showed that all questionnaire items have a significant correlation at the 0.01 level (2-tailed) with the total score. Item validity of PAQ-A ranged between 0.338 – 0.737, while inter-item correlation ranged between -0.019 – 0.569.

Reliability of PAQ-A

We tested the reliability of PAQ-A by using the Cronbach Alpha to investigate the internal consistency of the questionnaire. We found that the $\alpha=0.740$, which showed that the reliability of PAQ-A is acceptable.

Validity of PAQ-C

Concurrent Validity

We recruited 58 elementary school students to test the validity of PAQ-C. However, data from 2 students were excluded from the analysis to check the concurrent validity due to incomplete data, e.g., participants did not attend the IPFT test, leaving data from 56 students for final analysis. We found that the correlation between the IPFT scores and the PAQ-C scores is low ($\rho=0.165$), and that the correlation is not significant ($p > 0.05$).

Item Validity and Inter-Item Correlation of PAQ-C in Urban School

There were differences in the number of recess times between the urban and rural elementary schools. The rural elementary school has one recess only (no lunch time break); hence item no 4 was not answered by participants at this school. Based on this, we analyse the item validity and inter-item correlation of PAQ-C in each school separately. We found responses from all 32 participants in urban school can be included in the item validity and inter-item correlation analysis. Results showed that most of the questionnaire items have a significant correlation at the 0.01 level (2-tailed) with the total score. Only item 1 has no significant correlation with the total score. Item validity of PAQ-C at the urban school ranged between 0.329 – 0.667, while inter-item correlation ranged between 0.001 – 0.555 (see Table 4).

Table 4. Item Validity and Inter-Item Correlation of PAQ-C in Urban School

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	TOTAL
Q1	Pearson Cor	.316	-.019	.163	-.095	.208	.334	.230	.013	.329	
	Sig. (2-tailed)	.079	.918	.373	.604	.254	.062	.205	.944	.066	
Q2	Pearson Cor		.226	.179	.298	.157	-.027	.206	.085	.473**	
	Sig. (2-tailed)		.214	.326	.097	.392	.883	.258	.643	.006	
Q3	Pearson Cor			.522**	.420*	.048	.297	.188	.067	.609**	
	Sig. (2-tailed)			.002	.017	.794	.098	.303	.714	.000	
Q4	Pearson Cor				.123	.079	.007	.001	-.058	.452**	
	Sig. (2-tailed)				.503	.668	.971	.994	.752	.009	
Q5	Pearson Cor					.191	.169	.384*	.496**	.664**	
	Sig. (2-tailed)					.294	.355	.030	.004	.000	
Q6	Pearson Cor						.555**	.402*	.133	.540**	
	Sig. (2-tailed)						.001	.022	.468	.001	
Q7	Pearson Cor							.455**	.520**	.625**	
	Sig. (2-tailed)							.009	.002	.000	
Q8	Pearson Cor								.471**	.667**	
	Sig. (2-tailed)								.007	.000	
Q9	Pearson Cor									.545**	
	Sig. (2-tailed)									.001	

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Note: Q= Questionnaire item, Pearson Cor = Pearson Correlation

Item Validity and Inter-Item Correlation of PAQ-C in Rural School

In rural school, we found responses from 26 participants can be included in the item validity and inter-item correlation analysis. As we have mentioned, the rural elementary school has no lunch time break; hence item no 4 was not answered by participants at this school. Analysis showed that all questionnaire items have a significant correlation with the total score. Item validity of PAQ-C at the rural school ranged between 0.423 – 0.818, while inter-item correlation ranged between 0.000 – 0.704 (see Table 5).

Reliability of PAQ-C

Analysis by using the Cronbach Alpha technique showed that the reliability of PAQ-C in urban and rural schools are 0.705 and 0.712, consecutively, which showed a moderate level of reliability.

Table 5. Item Validity and Inter-Item Correlation of PAQ-C in Rural School

		Q1	Q2	Q3	Q5	Q6	Q7	Q8	Q9	TOTAL
Q1	Pearson Cor		-.160	.198	.451*	.690**	-.139	.488*	.052	.535**
	Sig. (2-tailed)		.435	.331	.021	.000	.497	.011	.799	.005
Q2	Pearson Cor			.336	.101	.186	.257	.000	.329	.423*
	Sig. (2-tailed)			.094	.623	.362	.206	1.000	.100	.031
Q3	Pearson Cor				.302	.379	-.049	.115	.000	.448*
	Sig. (2-tailed)				.134	.057	.812	.577	1.000	.022
Q5	Pearson Cor					.704**	.263	.237	.072	.726**
	Sig. (2-tailed)					.000	.194	.244	.726	.000
Q6	Pearson Cor						.129	.403*	.175	.818**
	Sig. (2-tailed)						.532	.041	.394	.000
Q7	Pearson Cor							.086	.548**	.496*
	Sig. (2-tailed)							.678	.004	.010
Q8	Pearson Cor								.497**	.587**
	Sig. (2-tailed)								.010	.002
Q9	Pearson Cor									.552**
	Sig. (2-tailed)									.003

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Note: Q= Questionnaire item, Pearson Cor = Pearson Correlation

Discussion

This study aimed to investigate the validity and reliability of the Indonesian version of PAQ-A and PAQ-C. Both questionnaires were translated into the Indonesian language (Bahasa Indonesia) by following cross-cultural adaptation and translation guidelines by Epstein et al. (2015). We made some adaptations to the questionnaires to suit situations and culture in Indonesia, especially for item no.1 related to options for physical activity and sports.

We found that the concurrent validity of the Indonesian version of PAQ-A against the Indonesia Physical Fitness Test was low and that the correlation was not significant ($\rho=0.224$; $p > 0.05$). Previous studies showed similar results, that the validity of PAQ-A tended to be lower when it was compared with device-based measurements, such as accelerometers, than when being compared with other questionnaires. In English youth, Aggio et al. (2016) found that the modified PAQ-A has a lower correlation when compared with objective measurements ($r=0.39$) than when it was compared with total physical activity ($r=0.42$) ($p \leq 0.01$). Similarly, when being tested in Spanish adolescents, PAQ-A has a lower correlation when tested against accelerometers ($\rho=0.34$) than when it was compared with total physical activity ($\rho=0.39$) (Martinez-Gomez et al., 2009). Another study on Malaysian youth (Koh et al., 2020) also found that PAQ-A has favourable validity against the International Physical Activity Questionnaire (IPAQ) ($\rho=0.516$, $p<0.05$), but has a much lower association when it was compared with pedometer ($\rho=0.167$, $p=0.202$). However, we found better results for the item validity, which ranged between 0.338 – 0.737, while inter-item correlation ranged between -0.019 – 0.569.

Moreover, we found that the reliability of the Indonesian version of PAQ-A is acceptable ($\alpha = 0.74$). This finding is in line with a previous study, that the modified version of PAQ-A has an acceptable internal consistency ($\alpha = 0.72$) and test-retest reliability (ICC = 0.78) (Aggio et al., 2016). Bervoets et al. (2014) also found that the Deutch version of PAQ-A has a favourable reliability ($\alpha=0.758$). Supporting previous findings, a study in Malaysia found that the reliability of PAQ-A was acceptable (test-retest reliability=0.719, $p<0.05$; $\alpha=0.836$, ICC =0.718 and 95% range CI =0.569-0.822) (Koh et al., 2020).

For PAQ-C, our study found that the concurrent validity of the Indonesian version of PAQ-C against the Indonesia Physical Fitness Test is low and that the correlation is not significant ($\rho=0.165$; $p >$

0.05). In line with these findings, Kowalski et al. found that PAQ-C has a lower association when compared with accelerometers ($r = 0.39$), than when being compared with an Activity Rating ($r = 0.57$), Leisure Time Exercise Questionnaire ($r = 0.41$), and 7-day physical activity recall interview ($r = 0.46$) (Kowalski et al., 1997). More favourable results were shown for the item validity, which ranged between 0.329 – 0.818; while inter-item correlation ranged from 0.000 to 0.704, both in urban and rural samples. In line with these findings, previous literature in Turkey showed that PAQ-C has a favourable content validity index (CVI= 0.95) (Erdim et al., 2019). Recent systematic review and meta-analysis found that the pooled association between PAQ-C and MVPA scores from accelerometers was significant with a moderate effect size ($r = 0.34$ [0.29, 0.39], $Z = 15.00$, $p < 0.001$) (Marasso et al., 2021). Future studies aiming to check the validity of both PAQ-A and PAQ-C in the Indonesian youth may need to compare the questionnaires with device-based measurements measuring physical activity, and not to compare them with physical fitness tests.

Furthermore, we found that the reliability of the Indonesian version of PAQ-C is acceptable ($\alpha = 0.705 - 0.712$). This finding is consistent with previous studies in Turkey and Deutch. Erdim et al. (2019) found that PAQ-C has good reliability in Turkish youth ($\alpha = 0.77$ and ICC =0.91). In Deutch, Bervoets et al. (2014) found that PAQ-C has an acceptable reliability ($\alpha = 0.777$).

CONCLUSION

Our study concludes that the item validity of PAQ-A and PAQ-C were at a moderate level. The validity of the PAQ-A and PAQ-C were lower when they were checked with a physical fitness test, comparable to previous studies with device-based measurements. The Indonesian version of PAQ-A and PAQ-C have a moderate level of reliability. Our results suggest that the use of the questionnaires will be better complemented by other device-based measurements, such as accelerometers or pedometers.

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