EDUCATIONAL ASSESSMENT & EVALUATION | RESEARCH ARTICLE

Development and validation of an instrument to assess quality physical education
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Abstract: It is important to identify suitable parameters to measure and assess the quality of physical education. This paper aims to understand such measuring tool by focusing on professional perceptions and areas of concern of quality physical education (QPE). The research survey includes data gathered from 799 professionals in 11 cities in Asia. These professionals had experience working at primary schools (n = 155), secondary schools (n = 249), and universities (n = 395). To examine professional perceptions of quality physical education, at the preliminary stage of this study, 65 potential items were identified; of these, 48 items on 8 dimensions were retained, following an exploratory factor analysis. The 8 dimensions covered skill development and bodily awareness (α = .935), facilities and norms in PE (α = .932), quality teaching of PE (α = .923), plans for feasibility and accessibility of PE (α = .824), social norms and cultural practice (α = .825), governmental input for PE (α = .859), cognitive skills development (α = .920), and habituated behaviour in physical activities (α = .933). These factors indicated excellent internal consistency and model fit, enabling the construction of highly relevant statements to measure professional perceptions of QPE.

Subjects: Physical Education; Primary Physical Education; Secondary Physical Education; Sport Education; Research Methods

Keywords: quality physical education (QPE); perception of quality physical education; instrument for QPE study; physical education in Asia; professionals in physical education

ABOUT THE AUTHOR
Walter King Yan Ho The authors are researchers in physical education who are interested in investigating, developing and improving the quality works of physical education. The present data were collected from professionals in Asia. Their perception on Quality Physical Education (QPE) helped to construct this paper and at the same time encouraged the team to work on another project called Global Index of Quality Physical Education recently. The team needs to thanks for the kind assistance from ISCPES, FIEP, IAPESGW and IFAPA. Without their help and contribution, it is not able to arrive on current result. The team expects to have more papers written under the topic of QPE in the shortcoming time.

PUBLIC INTEREST STATEMENT
The movement for quality development in physical education (PE) has received attention as there is the demand to increase opportunities for exercise and sport in schools. A group of scientists decided to launch the research works on Quality Physical Education (QPE) with purpose to identify necessary dimensions that would help to develop the framework for quality development of PE. This study presents the instrument based on the perception of QPE from professionals in Asia. This study opens the systematic opportunities in investigating the knowledge about QPE, consensus in investigation and potential work of improvement in countries. The study also identified the possibilities of instrument for measuring QPE in the coming time.

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1. Introduction

Almost four decades have passed since the International Charter of Physical Education and Sport was first approved by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in (UNESCO, 1978). The Movement for Quality Development of Physical Education (PE) was created to explore issues ranging from human rights to the development of curricula, teaching, sport coaching, professional training, research and international collaboration, and related policy making. The follow up works such as the Magglingen Declaration and Recommendation on Sport and Physical Education presented at the 1st International Sport and Development Conference (Sport and Development 1st International Conference, 2003); the National Association for Sport and Physical Education (NASPE)’s National Standards for Physical Education (National Association for PE and Sport [NASPE], 2004); the UNESCO Report on Quality of Physical Education and Sport (UNESCO, 2005); the Centers for Disease Control and Prevention (CDC)’s Strategies to Improve the Quality of Physical Education (Centers for Disease Control [CDC], 2010); and UNESCO’s recent Quality Physical Education—Guidelines for Policy Makers (UNESCO, 2015) provide rich resources, enabling policymakers to construct a basic framework for quality development in physical education. Other worldwide organisations, including the International Committee of Sports Pedagogy (ICSP) and the Working Group of International Council of Sports Science and Physical Education (ICSSPE) have shared the Position Statement on Physical Education (International Council of Sport Science and Physical Education [ICSSPE], 2010) and Benchmarks for Physical Education Systems (International Council of Sport Science and Physical Education [ICSSPE], 2012) to enhance the quality development in PE. These establishments promote PE and sport learning as a human-rights issue urging governments and international communities to allocate resources to improve the quality development of PE in schools.

Quality physical education (QPE) has appeared in the UNESCO document in (UNESCO, 2005). It was defined as a planned, progressive, inclusive learning experience that forms part of the curriculum during the early years of primary and secondary education in the QPE guides for policy makers (UNESCO, 2015). Thus QPE acts as a foundation for lifelong engagement in physical activity and sports. Learning experiences offered to children and young people through PE must be developmentally appropriate to help them acquire psychomotor skills, cognitive understanding, and the social and emotional skills they need to lead a physically active life. The overarching aim of QPE in schools is to establish the habit of lifelong engagement in physical activity and sport during the early years of primary and secondary education (UNESCO, 2015).

Although QPE has received wide support, implementing it is not a simple task. There are many interwoven issues to address, including the lack of need for a quality-measurement tool to assess physical education programmes, the debate over making physical education compulsory for all children without discrimination, inadequate time allocation, staffing issues, governmental support, and the need for official recognition of the subject. Overall, there is much challenging work to be done. Environmental, cultural, and economic conditions, and the educational background both facilitate and act as barriers to PE programme. When nations decide to reform their PE programmes, the development process can be difficult. Ruscoe (1969) highlighted the difficulties associated with educational development in developing countries, arguing that a nation’s education system must be ready for reforms in order to succeed and be functionally suitable. Critical issues that arise during the development of QPE must be dialectically analysed. More information, and a greater understanding of these underlying issues would strengthen methods of developing a comprehensive framework for QPE research and development (Marshall & Hardman, 2000).

In 2013, four international associations of the International Society for Comparative Physical Education and Sport (ISCPES), Fédération Internationale D’éducation Physique (FIEP), the International Association of Physical Education and Sport for Girls and Women (IAPESGW), and the International Federation of Adapted Physical Activity (IFAPA)—launched a comprehensive research project on QPE. A questionnaire was designed, focusing on issues related to the general perception of QPE, QPE in learning, and supporting issues in QPE development. The questionnaire
was distributed in 2014 and data collection was completed in 2015. More than 1609 professionals in the field of sports and PE from Asia, Europe, and Latin America completed the questionnaire. Readers can have the understanding of this research through number of publications from 2017 to 2019 (Ho et al., 2019a, 2018, 2019b). Although there is a number of publications, the research team is aware of the insufficiency in focusing the discussions on perceptions of QPE as a whole process of PE. A comprehensive understanding is important if there is the need to develop the tool to investigate the QPE issue. Therefore, the present study took the decision to analyse the 65 items, and screened statements with potential relevance to further research on QPE.

Unlike data collected in Latin America and Europe, where most cities shared similar economic circumstances and developmental prospects in physical education, the sample used in the present study was drawn from cities with diverse educational, economic, religious, and socio-cultural backgrounds. This background information has been discussed in papers published between 2017 and 2019 (Ho et al., 2019a, 2018, 2019b; W.K.Y. Ho et al., 2017). Meyrick's (2006) study provides support for this decision, as good research must cover a comprehensive range of evidence; intersecting conditions help to define and outline what to research. A data structure that incorporates diversified circumstances can provide substantial results for the research and study of QPE.

2. PE in Asia

The development of PE in Asia was deeply affected by colonial influences, which are very different from Western culture traditions (Ho, 2007a). Recent debates about the development of QPE programmes in Asia have focused on concerns about methods of effectively developing curricula, instruction, assessment, and academic learning time, as well as ways of improving infrastructure and support systems, including facilities, resources, and professional education. In attempting to address these issues, educational authorities in Asia have focused on different areas. For example, the Education Department of the Hong Kong SAR government launched its Key Learning Area Curriculum Reform in Hong Kong in 2000. This reform focused on Learning to Lean in Education (Curriculum Development Council (CDC), 2000). The Oxford Business Group held a discussion on educational reform in Thailand, in which Standard-Based Education was described as the focus of the 2008 reform (Oxford Business Group, 2008). These reforms highlight a focus on areas that are essential for increasing key achievements in society. However, in achieving such reforms, development cannot focus exclusively on educational arrangements, but it must also consider other elements holistically. McNeil et al.'s (2008) discussion of QPE in Singapore highlights problems with QPE development, listing difficulties with staffing, the duration of PE lessons, and class size as constraints on the success of QPE development. In China, despite the government’s focus on offering QPE to children, it is common to have 50–60 students in a single class; in fact, 80 students per class is the norm (Wang et al., 2009). In addition to the large number of students, researchers have shown that a lack of adequate space and PE equipment, and time-allocation problems make it difficult to improve quality (Wang et al., 2009). Gender inequality in PE and sports has been found in the Middle East and Asia. In Bahrain, traditional barriers and parental disapproval discourage girls from participating in PE lessons; in Taiwan, cultural bias and a lack of facilities, equipment, and resources hinder PE development (Holzweg et al., 2013). Each country has its own regulations and strategies for maintaining the PE curriculum. In India, as in other developing countries, professionals are striving to make PE a compulsory subject (Confederation of Indian Industry (CII), 2017). By contrast, in developed cities such as Macau, although PE is a compulsory subject, teaching quality, time allocation, class assessment, funding, and skill-based learning are among the areas that need proper attention (Ho, 2007b). In China, the impact of traditional culture, social recognition of the profession of PE teachers, students’ understanding of the importance of PE, and other factors have determined the status of Chinese school PE (C. Jin, 2016). Based on a qualitative survey of eighteen teachers, A. Jin (2013) has identified a number of structural, personal, and cultural factors that may prevent PE teachers from actively implementing the new health-based physical-education curriculum. In the Philippines, located in the Pacific Ring of Fire and typhoon belt, the unstable natural environment poses a disadvantage for QPE. Although the country has
a robust education sector, some regions, including parts of the island of Mindanao, are riddled with conflict and poverty, which frequently disrupt the school calendar, and cast doubt on whether the state can implement QPE, based on UNESCO recommendations (Lorraine, 2013; UNESCO, 2015). These concerns, alongside purpose-driven development, give physical education a diversified structure and unique qualities. These influence the development of a comprehensive range and intersected conditions, shaping the multidimensional outline of what to research.

3. Current research
While considering methods of investigation, McNeill et al. (2008) indicated the interrelationship of qualified professionals, class size, and curriculum time as major constraints in maintaining QPE in Singapore schools. Hardman (2009) indicated the differences between countries regarding curriculum design, the status of PE in primary and secondary schools, instructional time allocation, and general practices in PE. These studies provide some insight into the background and status of PE, but no attempts have been made to determine the actual concerns of professionals’ perception and satisfaction with the quality issues of PE. The only information that Hardman’s research provides are the means, standard deviations, and frequencies (percentages) instead of the current status of PE assessed through a validated scale. Valid and reliable measures of perceptions of QPE may help foster a discussion of whether QPE has been achieved in the schools of various countries. Therefore, in this study, PE professionals working at schools (primary and secondary) and universities from Asia were invited to participate. While designing this study, it was considered that without knowing the concerns of the professionals dialectically, it would be difficult to identify a proper focus for developing quality PE in schools. More specifically, these participants were invited because they are educated, they have earned qualifications in relevant fields, they have an understanding of the profession, and they are the ones who implement PE policies at the ground level. Thus, understanding their perspective and taking their inputs could lead us in the right direction. This study could help to develop a comprehensive and productive programme to facilitating the involvement of students in structured PE programmes in Asia. Consequently, the research question is as follows: How to assess QPE in Asian schools based on the professional’s perception and what are the factors that underprint professionals’ perception of QPE? Therefore, in its overarching design, this study aims to develop a valid and reliable tool to take stock of what has been achieved, and to examine how professionals perceive the quality of PE in school settings. The study investigates how QPE is understood and practised by professionals, developing a framework for assessing the QPE in schools.

4. Methods

4.1. Participants
The data collection work was assisted by researchers from different cities. Overall, 799 professionals from 11 Asian cities participated in this study (Tables 1 and 2). All of the invited participants were primary- or secondary-school PE teachers, professionals working in the field of physical education in universities and government-educational authorities, or school supervisors responsible for developing the PE curriculum. They were recruited during local seminars, meetings, and training activities in 2014 to 2015. The participation of these professionals at the seminar and completion of the questionnaire were voluntary as well. After introducing the aim and purpose of the current study to participants, they chose or not to participate in the research. If participants agreed with purpose of the research and wanted to participate, they were asked to sign consent form before completing the questionnaire. Only participant who signed the consent form were included in the study.

5. Questionnaire language
The questionnaire with 65 items including the consent form, information on gender, job position, years of work experience and demographic-information questions was designed in English. The items in the questionnaire were written in simple English and assumed that the participants would have no difficulty understanding the items. When participants filled up the questionnaires, it was
| Country (City) | Primary School PE Teacher | Secondary School PE Teacher | Other PE Teachers | Work experience in years, Total |
|---------------|----------------------------|------------------------------|------------------|--------------------------------|
|               | M  | SD  | N   | M  | SD  | N   | M  | SD  | N   | M  | SD  | N   |
| Macau SAR     | 4.31 | 2.56 | 18  | 9.06 | 4.76 | 18  | 11.67 | 7.29 | 24  | 8.68 | 6.22 | 60  |
| Taipei        | 10.25 | 5.97 | 16  | 10.27 | 7.00 | 66  | 6.29 | 6.58 | 17  | 9.59 | 6.88 | 99  |
| Kobe          | 10.00 | 5.23 | 7   | 10.59 | 5.07 | 22  | 8.02 | 6.08 | 58  | 8.83 | 5.84 | 87  |
| Tel Aviv      | 6.75 | 1.71 | 4   | 10.67 | 1.53 | 3   | 14.90 | 2.38 | 10  | 12.24 | 4.05 | 17  |
| Seoul         | 8.20 | 6.56 | 15  | 11.55 | 7.92 | 20  | 13.64 | 8.90 | 39  | 11.97 | 8.38 | 74  |
| Changsha      | 5.00 | 3.46 | 7   | 10.36 | 8.29 | 25  | 6.41 | 6.52 | 58  | 7.40 | 7.08 | 90  |
| Chengdu       | 9.92 | 7.91 | 24  | 14.36 | 10.99 | 21  | 5.90 | 6.99 | 40  | 9.12 | 8.97 | 85  |
| Teheran       | 10.10 | 6.35 | 20  | 10.15 | 7.62 | 20  | 10.88 | 6.08 | 40  | 10.50 | 6.48 | 80  |
| Kuala Lumpur  | 8.59 | 7.39 | 17  | 6.65 | 4.73 | 20  | 8.39 | 6.20 | 46  | 8.01 | 6.13 | 83  |
| Amravati      | 6.85 | 2.39 | 20  | 7.12 | 3.85 | 26  | 9.45 | 9.22 | 37  | 8.09 | 6.69 | 83  |
| Mawari        | 3.71 | 1.70 | 7   | 7.75 | 7.74 | 8   | 10.50 | 9.55 | 26  | 8.80 | 8.63 | 41  |
| Total         | 8.04 | 5.95 | 155 | 9.96 | 7.14 | 249 | 9.07 | 7.55 | 395 | 9.15 | 7.2  | 799 |
normally done in group setting, like having class together. The researcher would help to guide the participants in completing the questionnaires by, for example, explaining the different terms when in difficulty of understanding. The researcher was native speaker in the participant’s language and fluent in English language and was informed beforehand in the aim and scope of current study. This procedure ensured that the participants understood the meaning of the questions correctly and could freely reply according to their perception/opinions. Participants who still had difficulty understanding and answering the questions were eliminated from the sample before the analyses were conducted.

5.1. Ethics statement
After project approval was granted by the first author’s institution, the principal investigator (PI) discussed the methodology and aims of the study with co-authors and colleagues from the PI’s workplace. This study has followed the Helsinki Declaration of 1975. The co-authors subsequently discussed the research with their own universities to obtain permission to proceed, and with other universities/schools in their cities to collect data from identified professionals.

5.2. Procedure
Participants were recruited from among PE professionals from early 2014 to mid-2015; participation was voluntary. Information sheets were distributed to all the participants. Since the participants read a detailed information sheet before filling out the questionnaire, completion of the questionnaire was assumed to indicate consent.

5.2.1. Item generation and content validity
An instrument, known as the Professional Perceptions Toward Quality PE (PPTQPE), was developed for this study, based on the reviewed research of Song and Chen (2012), Arar and Rigbi (2009), Subramaniam and Silverman (2007), Guan et al. (2005), and Keating and Silverman (2004). The instrument was verified using a content validity procedure suggested by Lynn (1986). Existing instruments were not considered, as most were constructed within a specific cultural environment; this can create idiosyncratic problems, due to the formulation of items related to the specific culture (Poortinga, 1989). To develop the questionnaire, the research group used references drawn from the guidelines on QPE developed by the National Association for Sport and PE in 2004, the 2005 UNESCO report on QPE, the ICSSPE 2010 International Position Statement on PE, and the ICSP’s preliminary work to develop international benchmarks for PE systems (International Council

| Table 2. Gender-based descriptive information of participants with respect to their professional status and years of work experience |
|---------------------------------------------------------------|
| **Professional Status**           | **Years of work experience** | **Total** |
|----------------------------------|------------------------------|-----------|
| **Male**                         |                              |           |
| Primary School PE Teacher        | 8.60                         | 6.4       | 105       |
| Secondary School PE Teacher      | 9.97                         | 7.1       | 145       |
| Other PE Professionals           | 9.01                         | 7.6       | 250       |
| Total                            | 9.20                         | 7.2       | 500       |
| **Female**                       |                              |           |
| Primary School PE Teacher        | 6.86                         | 4.9       | 50        |
| Secondary School PE Teacher      | 9.96                         | 7.3       | 104       |
| Other PE Professionals           | 9.19                         | 7.5       | 145       |
| Total                            | 9.07                         | 7.1       | 299       |
of Sport Science and Physical Education [ICSSPE], 2010). The content validity of the professional perceptions of QPE in schools (QPES) were evaluated to determine whether all important aspects were covered, identified, and essential; items that were not desirable in specific construct domains were excluded (Straub et al., 2004). The study adopted the two-stage content-validity process developed by Lynn (1986), which included developmental and judgement stages.

5.2.2. Developmental stage—developmental stage
The first stage focused on defining professional perceptions of QPE, generating content domains for each component, and developing an item pool for each domain. Two methods were used to generate the content domains and relevant items. The first method pooled relevant items from previous studies, and then generated new items. The second method was initiated by gathering items and domains from target respondents. By using both methods to generate content domains and the items in each domain, this study ensured that all relevant items and possible content domains were considered at the beginning of the instrument-development process (Keating & Silverman, 2004). As the items consisted of descriptive statements, the authors reviewed items in the literature extensively, relating them to the context in their own countries. This process resulted in the initial dimensions proposed: the status of PE, PE curricula in schools, PE teachers and their qualifications, the infrastructure needed to conduct PE, teaching PE, the benefits of PE, and current challenges to PE. The following items from the literature reviews were then generated to assess each content domain: skill development and bodily awareness (SDBA), facilities and norms in PE (FNPE), quality teaching of PE (QTPE), plans to make PE feasible and accessible (PFAPE), social norms and cultural practices (SNCP), governmental input for PE (GIPE), cognitive-skills development (CSD), and habituated behaviour in physical activities (HBPA). The authors identified 105 items related to professional perceptions of QPE; these were assessed for clarity and readability. Overall, 105 items were agreed upon; items recommended by the authors represented the content validity. As a secondary process, six volunteer students (familiar with the concept of QPE in school settings) were invited to determine whether the items generated by the authors in each factor were sufficiently clear and relevant. The students assessed whether the items described professional perceptions of QPES, whether important aspects or domains had been omitted, and whether any statements should be excluded from the existing items. The six students included one PhD student, two final-year Master’s students, two sophomores, and one freshman. Three of the students studied PE, while the remaining three were from the social-science field. Based on their recommendations, four statements were revised. Ultimately, 65 items were finalised (Song & Chen, 2012).

5.2.3. Judgement stage
The judgement stage focused on item validity and domain validity. Three external experts (PE professors) from other universities and the six previously mentioned student participants were invited to join this process. The three professionals were invited to determine the face validity and indicate whether the questionnaire provided an appropriate description of the study purpose and content area. The team also evaluated the feasibility, readability, consistency of style, formatting, clarity of language, and domain validity of the questionnaire. The use of these procedures was introduced by Haladyna (1999), Trochim (2001), and DeVon et al. (2007). A quantitative sorting process was carried out to determine whether the statements fit the instrument in the assessment of professional perceptions of QPES, and whether the statements were consistent with the eight corresponding dimensions. The participants were asked whether statements should be included using a 3-point scale (1 = No, 2 = Maybe, and 3 = Yes), and how confident they were that items should be included (i.e., 1 = Not sure, 2 = Sure, and 3 = Very Sure). A minimum of two out of three experts agreed that each statement belonged to the instrument (where 3 = yes), and the mean confidence score was greater than 2.0 (where 2 > sure). The experts were asked to associate each of the 65 items with one of the 8 dimensions, indicating how confident they were that their selection related to the specific content domain. The rating scales and criteria for domain validity were the same as the item-validity criteria. During this process, two items were revised and one item was moved to a different content domain. In the end, 65 items were retained in the
instrument, classified into 8 original dimensions. The six student volunteers were invited to verify the items and domain validity, based on the experts’ classifications. The same procedures and regulations were adopted, and no modifications were required.

5.2.4. Response format
The QPE questionnaire comprised two sections. The first section consisted of 65 items on QPE. Participants were asked how strongly they agreed with each statement on QPESs in their respective countries. They responded using a 6-point, positively packed agreement-rating scale. This scale included three negative and three positive agreement responses with identical scores (i.e., strongly disagree = 1, mostly disagree = 2, slightly disagree = 3, moderately agree = 4, mostly agree = 5, and strongly agree = 6). The use of positively packed rating scales are known to generate discrimination in the context of social desirability (Brown, 2004; DeVellis, 2003; Lam & Klockars, 1982; Song & Chen, 2012).

In addition, a confirmatory factor analysis (CFA) was carried out using AMOS 21.00 (IBM) to examine the retained eight-factor (48 items) structure from the exploratory factor analysis. The overall model fit was evaluated using multiple goodness-of-fit indexes, including a chi-square value, comparative fit index (CFI), Bentler-Bonett normed fit index (NFI), parsimony comparative fit index (PCFI), and the root mean square error of approximation (RMSEA), which was accompanied by a 90% confidence interval (90% CI). Although much debate surrounds the selection of precise thresholds of fit, especially within the field of theory-based multi-item/factor CFA testing (Markland, 2007; Marsh et al., 2004), it is commonly accepted that thresholds of >.90, close to (or less than) .08 (Bentler, 1995), and up to .08 (Bollen, 1989; Browne & Cudeck, 1993) for the CFI and RMSEA indicate an acceptable model fit. In addition, test-retest reliability was checked using an independent data sample.

5.3. Data analysis
Both statistical and empirical techniques were used to select the items. The 65 items were subjected to descriptive and frequency analyses. Using SPSS 20, the research team examined data quality in terms of frequency distribution and item discrimination. An exploratory factor analysis (EFA) with maximum likelihood extraction and direct oblimin rotation was used to investigate the structure of quality PE, and to define a set of factors accounting for the common variance among the items. These items were subsequently evaluated by their loading on each factor. The second phase of the analysis confirmed the different subscales and structures of the 65 items. A reliability analysis (Cronbach’s alpha) was performed to determine the contribution of each item to its respective factor. When items were deemed to be statistically equivalent, the authors were asked to determine which items to retain and place under the appropriate categories to reflect their close conceptual meaning.

6. Results

6.1. Preliminary Analysis
The present study set out to identify a potential framework for investigating QPE, and to subsequently determine a structure for analysis. To achieve the primary purpose of the study, defining a set of factors to account for QPE, we present the results of the maximum likelihood extraction with a direct oblimin rotation. To determine the number of factors, several criteria, including differences between adjacent eigenvalues, a scree plot, and differences in the percentage of variance, were used (Figure 1). The goal was to account for adjacent factors and, more importantly, to consider the factor structure.

The presented solution presents the following eight factors (subscales): SDBA, FNPE, QTPE, PFAPE, SNCP, GIPE, CSD, and HBPA. These factors had eigenvalues of 15.921, 6.485, 3.187, 2.623, 1.941, 1.287, 1.072, and 1.025, respectively, with 64.14% variance.
The results suggest that Asian professionals have a different perception of the development of supportive elements for QPES, core values (such as safety and accessibility), and curriculum arrangement. The internal consistency (Cronbach’s alpha coefficient) of the eight subscales was calculated. Based on the item statistics, 8 items from SDBA, 13 from FNPE, 6 from QTPE, 2 from PFAPE, 3 from SNC, 5 from GIPE, 5 from CSD, and 6 from HBPA were selected and retained because of their excellent internal consistencies (Table 4). Of the 65 items, 17 items with low factor loadings were excluded from the analysis. Thus, the original set of 65 items was reduced to 48 items, which are listed in Table 4 for reference.

7. Underlying structure of professional perception of quality PE
The results of the factor analysis indicated that the 48 items listed in the final version of the questionnaire demonstrated sound and good inter-correlation results, as evidenced by the high value (.949) of the Kaiser-Meyer-Olkin measure of sampling adequacy (MSA) and a significant Bartlett’s test of sphericity. The MSA comprised an index used to quantify the degree of inter-correlation among the items, and the appropriateness of the factor analysis. A measure that calculated a value greater than .50 for the entire matrix or an individual variable would indicate the appropriateness of acceptance (Field, 2000). The results of the factor analysis are presented in Tables 3 and 4. As indicated in Table 3, all items with factor loadings greater than .50 were retained. When the pattern matrix was considered (factor and structure matrices were considered because of cross-loading), three subscales were determined to retain and reflect the conceptual framework.

8. Internal consistency of the professional perception of quality PE
The internal-consistency reliability coefficients (Cronbach’s alpha) for each subscale were computed. As shown in Table 4, the Cronbach’s alpha coefficients for all eight factors were as follows: SDBA (.935), FNPE (.932), QTPE (.923), PFAPE (.884), SNC (.825), GIPE (.859), CSD (.920), and HBPA (.933), indicating that the items were consistent within each factor and that
| SI No | Items description | Loading | M    | SD   | $h$  |
|-------|-------------------|---------|------|------|------|
| **FACTOR 1: Skill Development and Bodily Awareness (SDBA)** | | | | | |
| Item 51 | Enhance their physical skills. | .806 | 4.66 | 1.10 | 0.70 |
| Item 55 | Enhance students’ knowledge of sport related terms. | .796 | 4.42 | 1.19 | 0.70 |
| Item 54 | Provide students with chances to take part in different physical activities. | .782 | 4.58 | 1.16 | 0.72 |
| Item 53 | Enhance students’ knowledge in different activities. | .715 | 4.48 | 1.17 | 0.70 |
| Item 58 | Give students chances to learn and interact with classmates | .668 | 4.66 | 1.12 | 0.54 |
| Item 57 | Teach students how important activity is to the process of growth. | .596 | 4.54 | 1.16 | 0.63 |
| Item 50 | Help students to understand how their bodies work. | .578 | 4.38 | 1.14 | 0.63 |
| Item 45 | Help students to develop a habit in attending sport activities after school and to use their spare time in sport wisely. | .538 | 4.47 | 1.20 | 0.64 |
| **FACTOR 2: Facilities and Norms in Physical Education (FNPE)** | | | | | |
| Item 6 | School should have safe and suitable environment for physical education lesson. | .806 | 5.59 | 0.87 | 0.64 |
| Item 4 | School should have safe and suitable equipment for physical education lesson. | .802 | 5.67 | 0.77 | 0.62 |

(Continued)
| Sl No | Items description                                                                 | Loading | M  | SD | h    |
|-------|----------------------------------------------------------------------------------|---------|----|----|------|
| Item 5 | School should have safe and suitable facilities for physical education lesson.     | .786    | 5.68 | 0.75 | 0.59 |
| Item 12 | Students should be given opportunities for active learning in physical education lesson. | .780    | 5.46 | 0.87 | 0.63 |
| Item 10 | Positive sport related attitudes and values should form a major focus in learning. | .752    | 5.37 | 0.91 | 0.61 |
| Item 9  | Health knowledge should be regarded as one of the major areas of learning.        | .738    | 5.41 | 0.90 | 0.56 |
| Item 8  | Different types of physical activities and associated knowledge should form the content through which young people learn. | .715    | 5.26 | 1.02 | 0.56 |
| Item 11 | The teaching and learning of physical education should be fun and enjoyable.      | .712    | 5.4  | 0.97 | 0.50 |
| Item 3  | Physical education should be a compulsory subject in school for all children.     | .700    | 5.56 | 0.90 | 0.51 |
| Item 13 | Extension physical activity opportunities after-school or extra-curricular/co-curricular activities are essential components in helping students to extend their learning experiences in sport and physical activities. | .677    | 5.26 | 0.98 | 0.49 |
| Sl No | Items description                                                                 | Loading | M   | SD  | h   |
|-------|-----------------------------------------------------------------------------------|---------|-----|-----|-----|
| Item 7 | Teacher should be qualified to teach physical education.                          | 0.675   | 5.4 | 1.00| 0.48|
| Item 2 | Physical education should be accessible to all children, whatever their ability/disability, sex, age, cultural, race/ethnicity, religious, social or economic background. | 0.667   | 5.49| 0.87| 0.46|
| Item 1 | Physical Education is the most effective means of equipping children with the skills, attitudes, values, knowledge and understanding for lifelong participation in physical activity and sport. | 0.544   | 5.22| 1.06| 0.34|

**FACTOR 3: Quality Teaching of Physical Education (QTE)**

| Sl No | Items description                                                                 | Loading | M   | SD  | h   |
|-------|-----------------------------------------------------------------------------------|---------|-----|-----|-----|
| Item 26 | Learn and develop basic skills of different physical and sport activities.       | −0.680  | 4.68| 1.15| 0.67|
| Item 24 | Demonstrate the basic understanding of the importance of physical activities and health. | −0.674  | 4.42| 1.26| 0.68|
| Item 25 | Communicate ideas, feelings effectively with others.                             | −0.671  | 4.34| 1.21| 0.65|
| Item 22 | Basic motor skills within the context of appropriate physical activities of low organization. | −0.662  | 4.39| 1.25| 0.66|

(Continued)
Table 3. (Continued)

| SL No | Items description                                                                 | Loading | M    | SD  | h    |
|-------|------------------------------------------------------------------------------------|---------|------|-----|------|
| Item 28 | Demonstrate basic skills in decision making, communication, etc.                   | -.631   | 4.37 | 1.21| 0.71 |
| Item 27 | At middle class level, developing appropriate health and fitness understanding that includes setting and achieving personal goals for healthy living. | -.631   | 4.53 | 1.17| .720 |

**FACTOR 4: Plans for Feasibility and Accessibility of Physical Education (PFAPE)**

| Item 60 | There are frequent international collaborative plans between institutes in preparing QPES. | .899    | 3.64 | 1.41| 0.89 |
| Item 59 | There are frequent inter-states collaborative plans between institutes in preparing QPES. | .728    | 3.8  | 1.39| 0.72 |

**FACTOR 5: Social Norms and Cultural Practice (SNCP)**

| Item 64 | Religious culture is an issue in contributing the development of unequal learning opportunity in our country. | .860    | 3.12 | 1.65| 0.76 |
| Item 63 | Gender is an issue in contributing the development of unequal learning opportunities in our country. | .808    | 3.47 | 1.58| 0.64 |

(Continued)
| Sl No | Items description                                                                 | Loading | M   | SD  | \( h \) |
|-------|-----------------------------------------------------------------------------------|---------|-----|-----|---------|
| Item 65 | Economy is an issue in contributing the development of unequal learning opportunity in our country. | .669    | 3.61| 1.68| 0.51    |

**FACTOR 6: Governmental Input for Physical Education (GIPE)**

| Item 19 | Support research to improve the effectiveness and quality of physical education. | .850    | 4.15| 1.32| 0.72    |
| Item 21 | Recognize the distinctive role of PE as part of a balanced education system for the realization of human potential, healthy, health and well-being of all citizens. | .795    | 4.23| 1.29| 0.68    |
| Item 20 | Work with international financial institutions to ensure physical education is included as part of their aid programmes in education. | .740    | 3.82| 1.43| 0.66    |
| Item 17 | Recognize that good quality physical education depends on well-qualified educators and thus priority is provided for training of qualified personnel even when other resources are in short of supply. | .678    | 4.28| 1.3  | 0.49    |
| Item 14 | Implement policies for physical education as human right issue for all children. | .523    | 4.2 | 1.33| 0.38    |

**FACTOR 7: Cognitive Skill Development (CSD)**

(Continued)
| Sl No | Items description                                                                 | Loading | M    | SD  | h   |
|-------|-----------------------------------------------------------------------------------|---------|------|-----|-----|
| Item 39 | Help students to develop their critical thinking skills.                          | −.804   | 4.19 | 1.25| 0.77|
| Item 40 | Enhance students' ability in problem solving.                                     | −.756   | 4.29 | 1.21| 0.75|
| Item 42 | Raise students' innovative thinking.                                              | −.689   | 4.17 | 1.27| 0.75|
| Item 44 | Raise students' independent thoughts.                                             | −.580   | 4.36 | 1.17| 0.64|
| Item 38 | Help students to develop socially acceptable moral thinking and conduct.         | −.561   | 4.48 | 1.16| 0.65|

**FACTOR 8: Habituated Behaviour in Physical Activities (HBPA)**

| Sl No | Items description                                                                 | Loading | M    | SD  | h   |
|-------|-----------------------------------------------------------------------------------|---------|------|-----|-----|
| Item 35 | Demonstrate suitable decisions on actions for maintaining healthy living.       | −.740   | 4.53 | 1.19| 0.80|
| Item 34 | Demonstrate a habit of regular exercises.                                        | −.709   | 4.54 | 1.23| 0.79|
| Item 36 | Understand the relationship between physical and sport activities and personal and social development. | −.612   | 4.49 | 1.2 | 0.73|
| Item 37 | Take up suitable responsibilities to serve sports clubs or other related activities in school or community. | −.595   | 4.41 | 1.24| 0.65|
| Item 33 | Develop advanced proficiency in different physical and sport activities.         | −.511   | 4.59 | 1.18| 0.65|

(Continued)
| Sl No | Items description                                                                 | Loading | M   | SD  | h   |
|-------|----------------------------------------------------------------------------------|---------|-----|-----|-----|
| Item 32 | Develop necessary skills of participation in and out-of-school programmes available within the community and which have potential for life long involvement and participation | -0.507  | 4.52 | 1.20 | 0.60 |

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.
 Rotation converged in 17 iterations.
| Factor | 1   | 2     | 3     | 4     | 5     | 6     | 7     | 8     | Alpha | Mean ± SD | No of Items |
|--------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-----------|-------------|
| 1- SDBA | 1.000 | .248* | -.393 | .375* | .053  | .386* | -.671*| -.403*| .935  | 36.23 ± 7.70 | 8            |
| 2- FNPE | 1.000 | -.160*| .102* | -.063 | .151* | -.159*| -.174*| .932  | 70.83 ± 8.89 | 13           |
| 3- QTPE | 1.000 | -.146 | -.026 | -.343*| .318* | .541* | .923  | 26.75 ± 6.18 | 6             |
| 4- PFAP | 1.000 | .164* | .452* | -.419*| -.274*| .884  | 7.44  | 2.65   | 2             |
| 5- SNCP | 1.000 | .187* | -.145*| -.045 | .825  | 10.21 | 4.23  |       | 3             |
| 6- GIPE | 1.000 | -.420*| -.262*| .859  | 20.70 | 5.35  |       |       | 5             |
| 7- CSD  | 1.000 | .416* | .920  | 21.51 | 5.29  |       |       |       | 5             |
| 8- HBPA | 1.000 | .933  | 27.10 | 6.29  |       |       |       |       | 6             |

Extraction Method: Maximum Likelihood. 
Rotation Method: Oblimin with Kaiser Normalization. 

Note: 1- Skill Development and Bodily Awareness (SDBA), 2- Facilities and Norms in Physical Education (FNPE), 3- Quality Teaching of Physical Education (QTPE), 4- Plans for feasibility and Accessibility of Physical Education (PFAP), 5- Social Norms and Cultural Practice (SNCP), 6- Governmental Input for Physical Education (GIPE), 7- Cognitive Skill Development (CSD), 8- Habituated Behaviour in Physical Activities (HBPA).
The factors QTPE and CSD were strongly correlated with HBPA. SDBA also showed a strong correlation with PFAP and CSD. Further, a strong but negative correlation was reported with the factors SBA, QTPE, CSD, and HBPA. PFAP and CSD showed a strong negative correlation, as did QTPE and GIPE, while the remaining factors were moderately correlated.

Descriptive results for the mean factor scores were calculated. In general, professionals reported the most positive attitudes toward FNPE (M = 70.83; SD = 8.89), followed by SDBA (M = 36.23; SD = 7.70), HBPA (M = 27.10; SD = 6.29), QTPE (M = 26.75; SD = 6.18), CSD (M = 21.51; SD = 6.29), and GIPE (M = 20.70; SD = 5.35). The lowest mean was identified for PFAP (M = 7.44; SD = 2.65) and SNCP (M = 10.21; SD = 4.23). The Cronbach’s alpha coefficient (α = .940) indicated excellent internal consistency for the overall measure.

A separate dataset was used for the CFA (measurement model). To check the retained factors’ item loading, a measurement model was evaluated using multiple goodness-of-fit indexes, including chi-square value, CFI, NFI, PCFI, and RMSEA, accompanied by a 90% confidence interval (90% CI). The results of the robust CFA, using the maximum-likelihood estimation method, suggest that the eight-factor model provided an adequate fit to the data. For the current study, data were collected from a developing country (India) and a developed country (Macau SAR); demographic information is provided below (Table 5 and 6).

Table 5. Gender-based descriptive and professional status information of participants

| Country | Gender | Status | Total |
|---------|--------|--------|-------|
|         | Male   | Female | Master Final Students | School Teacher | University Teachers |       |
| India   | 174    | 208    | 82     | 89       | 211 | 382 |
| Macau   | 122    | 73     | 98     | 54       | 43  | 195 |
| Total   | 296    | 281    | 180    | 143      | 254 | 577 |

Table 6. Model fit indexes for the data collected using QPES

| Model H | N | χ² | CMIN | df | CMIN/DF | CFI | NFI | TLI | PCFI | RMSEA |
|---------|---|----|------|----|---------|-----|-----|-----|------|-------|
|         | 577 | 3128.297 | 3128.297 | 1052 | 2.974 | .903 | .861 | .896 | .842 | .058 |

Legend: Model H = the hypothesized model. N = sample size. CMIN = minimum discrepancy. DF = degrees of freedom. CFI = comparative fit index. NFI = normed fit index. RMSEA = root mean square error of approximation.
Table 7. Test-retest correlation of the samples from India and Macau

| Factors                                                                 | Extracted Sub-factors                                                                 | Test-Retest Reliability (India)          | Test-Retest Reliability (Macau)          |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------|
| No.                                                                       | Reliability                                                                           | Mean ± SD                               | Reliability                                                                           | Mean ± SD                               |
| Factor 1                                                                 | Skill Development and Bodily Awareness (SDBA)                                          | α = .807                                | α = .864                                | 88.66 ± 5.01                           |
| Factor 2                                                                 | Facilities and Norms in Physical Education (FNPE)                                     | α = .818                                | α = .851                                | 123.05 ± 13.14                        |
| Factor 3                                                                 | Quality Teaching of Physical Education (QITE)                                         | α = .806                                | α = .865                                | 60.02 ± 6.49                          |
| Factor 4                                                                 | Plans for Feasibility and Accessibility of Physical Education (PFAPE)                 | α = .808                                | α = .786                                | 18.83 ± 2.85                          |
| Factor 5                                                                 | Social Norms and Cultural Practice (SNCP)                                             | α = .796                                | α = .837                                | 31.02 ± 3.26                          |
| Factor 6                                                                 | Governmental Input for Physical Education (GIPE)                                      | α = .900                                | α = .846                                | 52.41 ± 6.27                          |
| Factor 7                                                                 | Cognitive Skill Development (CSD)                                                     | α = .812                                | α = .799                                | 49.97 ± 4.39                          |
| Factor 8                                                                 | Habilitated Behaviour in Physical Activities (HBPA)                                   | α = .832                                | α = .932                                | 60.25 ± 6.79                          |

9. Test-retest reliability

Test-retest reliability was conducted to examine stability over time; alpha coefficients were used to examine internal consistency (Table 7). As data for this study were gathered from developing and developed countries, test-retest reliability was conducted for data from locations in India and the city of Macau. Separate samples from India (n = 53) and Macau (n = 36) were used to demonstrate that the motives for participation measured by the QPES were stable over a fairly long period of four weeks. It is noteworthy that test-retest reliability over a four-week period was satisfactory, given that the participants (all residents of India and Macau) completed the questionnaires in English. English was not the first language of most participants. This suggests not only that the QPES is robust, but also that it is clear and comprehensible enough for its results to be generalised to other continents and non-native-English-speaking countries. The robustness found in the eight sub-scales of the QPES also showed high test-retest correlations (India, rs = .796 to .900 and Macau, rs = .799 to .932), supporting the stability of the components of the measure over time. Thus, the effect sizes of the QPES correlations reflected large effects.
10. Discussion
The overarching aim of this study was to develop an instrument to identify how professionals from various Asian countries perceived QPE. The findings indicate a model of professionals’ perception of QPE, conceptually and empirically developed using eight subscales. Of the 65 items, 48 were retained, and 17 were excluded because of low factor loadings. The findings indicate that the professionals’ perceptions centred strongly on the eight abovementioned factors.

The SDBA subscale in the model indicated that PE curricula could greatly enhance self-awareness, with individuals becoming more aware of their own bodies, the shapes they could make, the transfer of body weight, and their location in relation to other people and objects. They also emphasised skill development. Children can improve their body and spatial awareness with peers in a school environment (Hollett et al., 2016). This subscale consists of eight items with a mean score and SD of 36.23 ± 7.70 and high reliability (α = .935). With regard to the status of QPE, this finding is supported by Chaddock-Heyman et al. (2013), who argued that motor-skill development was pivotal to enhancing children's self-awareness and awareness of the outside world. As psychomotor skills are purely based on the progressive acquisition of mental and motor skills, this skill promotes the successful cultivation of an active lifestyle, which improves physical, cognitive, and mental health.

The second concern relates to the FNPE subscale. The core FNPE subscale also had good reliability (.932). This subscale consisted of 13 items, indicating the perspective of a structured PE curriculum, the safety and suitability of equipment, facilities and environment, and basic norms for the development of quality PE programmes in schools. In 2015, UNESCO’s International Charter of PE and Sport (Article 5) recommended that adequate and safe spaces, facilities, equipment, and dress options be provided and maintained to meet the needs of PE participants, physical activity, and sport, while being mindful of different needs associated with climate, culture, gender, age, and disability. Recreational activities, environment building, opportunities for activity, a well-arranged sport curriculum, content knowledge, instruction, and assessment were identified as the major components of QPE (National Association for PE and Sport [NASPE], 2004).

However, infrastructure quality was not a primary development concern. According to Drewett and O’Leary (2006), fewer than half the schools they studied had adequate equipment for the revised PE curriculum. The Irish National Teachers’ Organization presented the results of a survey at the 2007 Conference on Education, revealing that school PE equipment and resources were inadequate (Irish National Teachers’ Organization, 2007). These reports indicate that the adequacy (quality and quantity) of equipment is closely related to a region’s socioeconomic circumstances. However, researchers found poor facilities in oil-rich Kuwait (Hardman, 2008); Marshall and Hardman (2000) found insufficient indoor PE facilities in that country. De Vries (2003) identified different constraints in schools in Asia, including problems with PE curricular arrangements; overcrowded classes, with 40 or more students in each class; and PE and sport classes conducted in unused indoor and outdoor areas, rather than spaces specifically designed for and allocated to PE.

All statements indicated in the factor QTPE exhibited a mean ± SD of 26.75 ± 6.18. The factor earned a reliability score of α = .923, as calculated using Cronbach’s alpha; this factor included items related to safe and suitable facilities, equipment, the environment for PE lessons, and qualified PE teachers. The factor QTPE is best defined as well-developed, high-quality teaching pedagogical features/indicators, used to identify increasing accountability and expectations. It enables teachers to understand and demonstrate high-quality PE teaching, and suggests ways to inform the provision of high-quality teaching across the curriculum (Light et al., 2014). This subscale is associated with the ability to learn and develop basic skills, understanding different physical and sports activities, health, and motor skills. Importantly, it also includes items that involve the demonstration of basic skills in decision making, communication, and communicating ideas and feelings effectively to others. In connection to this finding, Light et al. (2014) have lucidly
described how the pedagogical features of Game Sense provide quality teaching and learning to make the provision of high-quality teaching practical across the curriculum. Indeed, the ultimate outcome of quality teaching is the cultivation of a deep understanding. It encourages students to ponder teachers’ questioning dialectically, and respond using assimilated knowledge in a concerted way within games (McNeill et al., 2008). The high expectations of teachers, and the opportunity to build a socio-moral environment in a game-setting context are prioritised to sustain students’ motivation to learn, speak, and test their ideas.

The PF APE had a mean score and SD of 7.44 ± 2.65 and high reliability (α = .884). This factor is best defined as regular international and inter-state collaborative plans that institutes need to prepare QPE. The current finding is well corroborated by a communiqué, announced by the Commonwealth Secretariat via recommendations for the Post-2015 Education Development Framework (2012), which stated that prevalent disadvantages and discrimination, based on socio-economic status, gender, geography, ethnicity, sexual identity, and special needs, could be resolved by an inclusive and overarching strategy in the education system. Ensuring adequate resources to achieve these “quality with equity” objectives will require international collaboration to mobilise resources for low-income countries and disadvantaged communities within countries. The EUPEA (2011) has argued that international collaboration between PE professionals is essential to the development of QPE, and should be promoted through exchange programmes for PE professionals.

The SNCP factor in the model prioritised concerns about religion, culture, gender discrimination, and socio-economic status—issues that lead to unequal learning opportunities in various countries. A structured PE curriculum, safe and suitable equipment and facilities, and a positive environment are prerequisites for the development of quality PE lessons. The professionals expressed the view that the principle of free PE should be upheld for all children, irrespective of their ability/disability, sex, age, culture, and ethnicity—or their religious, social, or economic background. The professionals believed that PE should be a compulsory school subject for all children, and that teachers should be qualified to teach PE. The social norms and cultural practice subscale had a mean score and SD of 10.21 ± 4.23, and high reliability (α = .825).

The GIPE mainly addresses government initiatives, which can build excellent PE programmes in particular states by supporting research to improve the quality of PE programmes, implementing policies that treat PE as a human-rights issue for all children, raising public awareness of the substantial benefits of PE, appointing well-qualified PE educators, and working with international financial institutions to ensure that PE is included in educational aid programmes. The GIPE subscale had a mean score and SD of 20.70 ± 5.35 and high reliability (α = .859). The role of governments in propagating PE programmes is immensely significant, enforcing legal requirements with respect to PE programmes in school curricula, while making it a compulsory subject (Doll-Tepper & Scoret, 2001). Governments must ensure that healthy programmes exist and operate without discrimination. For example, Botswana lacks special PE lessons for students with disabilities in school. Certain parochial beliefs and superstitious attitudes prevent physically challenged people from taking part in games, sports, and other physical activities, for fear of being injured or mocked by able-bodied people. The rate at which teenagers drop out of sports has increased; in some places, female participation in sports has drastically decreased. Fewer older people and members of ethnic minority groups participate in sports. The government must therefore play a significant mediating role by curbing increasing obesity rates and bringing balance to the entire system. As productive teachers are the key to maintaining quality in the PE system, educating and recruiting quality teachers is at the forefront of the Government Education Policy (Marshall & Hardman, 2000). In a study conducted with 73 principals from New South Wales, Australia, Lynch and Soukup (2017) investigated how the implementation of quality PE in primary schools was perceived. The results indicated that the main barrier to QPE in primary schools was the inability to recruit qualified or well-trained teachers.
The CSD subscale had a mean score and SD of 21.51 ± 5.29 and high reliability (α = .920). This factor included items such as helping students develop their critical thinking skills, problem solving, innovative thinking, and independent thought to enhance socially acceptable moral thinking and conduct. Several studies have reported that organised physical-activity classes can significantly enhance students’ cognitive skills. For example, Reed et al. (2010) identified a positive correlation between physical activity and fluid intelligence, which signifies the ability to reason quickly and abstractly. Children who performed moderate-to-vigorous physical activity during PE programmes performed better than their less active peers on the most demanding tasks, which required executive functions and academic performance (Castelli et al., 2007). These improvements included better scores on a mathematics test (Davis et al., 2011) and improved response accuracy in a memory test (Kamijo et al., 2011).

The HBPA factor shows that suitable decisions on actions to maintain the habit of healthy living through regular exercise help people understand the relationship between physical and sports activities, and personal and social development. This factor also includes responsibility for participating in school or community sports clubs and related activities to build the skills needed to gain advanced proficiency in various physical and sports activities within and outside school programmes available within the community. These can encourage lifelong involvement and participation. Research by Kremers et al. (2008) shows that strengthening the habitual nature of physical activity among children can help them establish higher levels of physical activity, which precedes a healthy lifestyle. For the promotion of physical activity among children to be successful, however, education must first raise their levels of awareness. This may explain why the HBPA subscale had a mean score and SD of 27.10 ± 6.29, and a high reliability (α = .933) score. It is also understood, based on research by Aarts et al. (1997), that instilling good habits in children predicts healthy living because behaviour performed repeatedly may be automatically triggered by environmental cues, and thus, become habitual (Kremers et al., 2008).

11. Conclusion
The QPE assessment tool developed in this study can be used as an instrument to understand professionals’ perceptions of the concept of quality development in PE in Asia. In addition, it can determine the status of PE quality development in their countries, and monitor the overall development of the field. The present study presents the properties associated with the validity and reliability of a scale designed to measure professionals’ perceptions of PE quality. The study further identifies factors that professionals consider important to the provision of quality PE learning in schools. This study can be used as the basis especially in Asia for recommending actions to institutions, governments, and concerned authorities. The assessment tool can be used for research and applied work carried out to learn about PE. The Cronbach’s alpha coefficients indicate excellent internal consistency for the overall measure, as well as the retained sub-factors, including the CFA and test-retest reliability. The QPE assessment instrument has a good fit with the data using the CFA approach in the eight-factor model. Items with low factor loadings can help researchers learn why particular items are not identified as important in the QPE study. This knowledge may help to clarify and explain progress in QPE development.

12. Recommendations
This research aims to measure professionals’ perceptions of quality PE (QPE). To the best of our knowledge, few studies have been conducted along the same lines. For this reason, future studies are strongly advised to apply the extracted items to country-wise research, using an independent sample. Future studies could also conduct class-wide research (on primary-school, middle-school, high-school, and university-level teachers) to analyse issues in-depth at each level of education. Nevertheless, the research team aware of the limitation in having 48 items as instrument for global study in QPE unless there is the works to analysis the data from other continents. The
research team expects to conduct this examination as quick as possible in order to develop a reliable tool for future measuring QPE in different regions.

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