

Introducing an Outcome Expectation Questionnaire and Its Psychometric Properties Regarding Leisure Time Physical Activity for Iranian Male Adolescent

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Background: Outcome expectation (OE) is known as a psychosocial determinant of leisure time physical activity (LTPA). Despite importance of this construct evaluation, there is no evidence of special questionnaire for measuring OE in Persian speaking Iranian male adolescents.

Objectives: This article reports development and psychometric evaluation process of a specific questionnaire that evaluates OE about LTPA among Iranian male adolescents.

Materials and Methods: Literature review and group discussions were used to select 26 items of this questionnaire based on 3 dimensions of OE (self-evaluation, social expectancy, and physical expectancy). All Participants (n = 720) were divided into two groups randomly after evaluating comprehensibility, face and content validity, and items analysis. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were separately operated on one of these groups for evaluation of the construct validity of questionnaire. The reliability of the questionnaire was estimated by the Cronbach α .

Results: EFA extracted 3 main factors explained 45.80%, 10.31%, and 7.51% of OE variance, respectively. Almost all fit indexes in CFA were acceptable (CMIN = 107.39, CMIN/DF = 2.619, CFI = 0.938, PCFI = 0.699, RMSEA = 0.067, PCLOSE = 0.034). Finally 11 items remained in the questionnaire, which showed excellent reliability on main study ($\alpha = 0.85$).

Conclusions: This study provided evidence regarding the reliability and validity of the Iranian male adolescent outcome expectation about leisure time physical activity (IMAO-PAC) and illustrated that this new questionnaire can be used to measure the perceived exercise benefits among target group in observational and interventional studies.

Keywords: Exercise; Adolescent; Questionnaires; Reproducibility of Results; Cognition; Iran

1. Background

Physical activity (PA) is known as a protective factor against chronic non-communicable diseases (1, 2). Nevertheless, many people do not have adequate PA and inactivity has become an important public health issues in all age groups, including adolescents (1-3). Because of increasing consumption of high calorie food, use of digital technologies, and adopting a sedentary life style in older ages, PA promotion has become one of the health care priorities among adolescents in developed and developing countries (1, 4, 5).

Social cognitive theory (SCT) is one of the most common theories and specifies a core set of psychological factors about PA. Based on this theory, a complex and multifaceted factors such as personal, intrapersonal, and sociocultural factors shape human behaviors (6). SCT describes how self-efficacy expectation and outcome expectation (OE) are necessary for behavioral change and its maintenance (7-11). Self-efficacy expectations relates to

individuals' beliefs in their ability to perform a specific behavior or capabilities to successfully execute a task. OE is individuals' beliefs about likelihood of outcomes from performing a certain behavior and evaluation of these results (9, 12, 13). Several studies have identified self-efficacy as a stronger predictor of PA than OE (8, 14, 15). It may be due to the stronger effect of self-efficacy that will affect relation between OE and PA. However, this does not mean that OE is unimportant in human motivation. It states that OE may be a necessary but insufficient mediator of PA (8, 9, 15).

Bandura noted 3 types of OE that are interrelated but conceptually different. These three types of OE include physical, social, and self-evaluative expectations (6). Physical OE describes beliefs about desirable physical outcomes that will occur after participating in PA such as weight loss or prevention of chronic diseases. Social expectations reflect the beliefs about increased opportuni-

ties for social reactions and attaining social approval that may result from participating in PA such as companionship and finding new friends. Finally, self-evaluative OE consists of beliefs about feelings of satisfaction and self-worth related to PA (8, 12, 16).

OE of PA is affected by cultural, social, economic, sexual, and racial differences (17). In addition, expectations of a man and types of it may change over time (8, 17). For example, when a person participates in PA as a protective behavior against non-communicable diseases, he or she will also be interested in the social aspects of exercise during the program. Thus, recognizing preferred types of expectations by using an accurate questionnaire will be essential for research and interventions about participation of people in PA and maintenance of this behavior (8).

Most of the related questionnaires consist one domain of this construct, especially before the introduction of three types of OE (15, 18, 19). This is a reasonable answer to somewhat ambiguous relation between PA and OE in some literature (8). In recent years, many efforts have been made to achieve and introduce accurate and specific instruments for the evaluation of OE about exercise and its dimensions in different sub-groups. For example, Wojcicki et al. have emphasized on using specific instruments for evaluation of psychological constructs, and introduced a multidimensional outcome expectation scale (MOES) for American older adults in 2009. Based on psychological characteristics of older adults, they derived initial items from a content analysis of other OE, perceived benefits, and barrier scales and finally selected 31 questions, including physical, social, and self-evaluated expectation. Finally they presented a 15-item scale in three-factor model that appears to be the best fit to the data (8). Resnick and her colleagues developed and reported acceptable reliability and validity for the outcome expectations of the exercise (OEE) scale. This questionnaire consists of 9 items in physical, social, and self-evaluation domain. It was tested on 320 American middle-aged and older adults too (15). McAuley and her colleagues performed a study for evaluation of psychometric properties of a questionnaire for exercise OE in patients with multiple sclerosis in 2010 (16).

The effects of psychological factors on PA are likely to vary widely among different populations, population subgroups, cultures, and gender subgroups (9, 20). Nevertheless, to our knowledge there is no evidence of specific questionnaire for measuring OE in Persian speaking Iranian male adolescents. Researchers who intend to study exercise OE in Iranian population have attempted to translate current OE measurement tools from original language (10, 11).

2. Objectives

This article reports development and psychometric evaluation process of a specific questionnaire that evaluates 3 types of OE regarding leisure time physical activities among Iranian male adolescents.

3. Materials and Methods

3.1. Type of Study and Participants

This study was cross-sectional in design, conducted in Isfahan in the central region of Iran in 2013. To ensure an appropriate sample size for exploratory factor analysis (EFA), Comrey and Lee recommended the sample sizes of 200 as fair, 300 as good, and 500 as very good (21). Kaiser-Meyer-Olkin (KMO) was also used as a criterion for adequate sampling in EFA. There are many recommendations about sufficient sample size for confirmatory factor analysis (CFA) and a wide range from 5 to 20 cases per each parameter was explained (22). Wojcicki et al. have developed a multidimensional outcome expectation for exercise scale using data of 320 participants for CFA (8). Because EFA and CFA were used to evaluate psychometric properties of the questionnaire, the main sample size have consisted of 2 separate samples for each analysis. Thus, 750 adolescents aged 15 - 19 years were recruited. Inclusion criteria were parental informed consent and student assent, no health problem that prevents physical activities, and not being a member of a professional sport team. Three participants were professional athletes, 12 students did not return the signed assent form and one of them had lower limb fracture. Finally, 734 adolescent expressed an initial interest and had other inclusion criteria. Data were collected via a self-administration questionnaire that answered in classrooms under the supervision of an investigator. After gathering data, incomplete questionnaires were omitted and only 720 participants that completed the answers to all question remained ($n = 720$, Mean age = 16.2, $SD \pm 1.0$) in the study. Initial descriptive and items analysis were performed on raw data ($n = 720$) and then all questionnaires were divided randomly into two samples. Data from sample 1 ($n_1 = 360$, Mean age = 16.29, $SD \pm 1.0$) were used for EFA and data from sample 2 ($n_2 = 360$, Mean age = 16.19, $SD \pm 1.3$) were used for CFA.

In order to increase generalizability, randomized multi-stage sampling method was used to select study subjects. Isfahan was divided into 3 regions according to low, intermediate, and high socioeconomic level based on previous studies and experts opinions. Then, 5 high schools were randomly selected in each region as clusters of sampling (totally 15 high schools). After calculating the study sample size (750), the allocated sample size to each high school was estimated based on total number of the students in each school. Finally participants were selected according to systematic random sampling method in classes.

3.2. Instruments

Instrument of study comprised 3 parts:

- Sociodemographic characteristics such as age and family income were gathered in the first part of the questionnaire.

- PA was determined by using a long-version of international physical activity questionnaire (IPAQ). This questionnaire was designed in 1998 by a group of Italian researchers and suggested as the International measurement of PA for the age range of 15 - 69 by WHO and CDC. IPAQ is used to evaluate subject's estimated metabolic equivalent (MET) on 5 domains of PA consisting of occupational, home and domestic, transportation, and leisure time physical activity (LTPA). IPAQ classifies individuals into 3 groups of total PA: Low activity (less than 600 MET-min/week), moderate activity (between 600 and 3000 MET-min/week), and severe activity (more than 3000 MET-min/week). The amount of LTPA is split into 3 levels based on leisure time that a person spends per week for PA. Less than 60 minutes, 60 - 180 minutes and over 180 minutes are assumed low, medium, and high LTPA, respectively (23). Reliability and validity of IPAQ were verified in Persian (24, 25).

- The suggested questionnaire for OE consists of 14 items, which measure the participants' beliefs about the likelihood and value of the consequences of LTPA using 5-point Likert scale (1 = absolutely correct to 5 = absolutely incorrect).

3.3. Item Generation

Comprehensive literature review was used to identify different aspect of OE and item generation. Finally, 26 items for OE questionnaire were designed based on socio-cultural characteristics of the target group in 3 domains of physical, social, and self-evaluation expectation of PA. First, all 26 items were verified via a group discussion by research group and then were given to 5 independent health professionals for evaluation of face validity and cultural adaptation. Each expert had rich experience in the area of physical activity as well as psychometric process. Items were evaluated based on criteria such as Persian literacy, simplicity, intelligibility, relevance, and appropriateness to the target group as well as absence of ambiguity. At this stage, 9 items were revised and changed in wordage, 10 items were deleted and 1 item was added based on professional comments.

Content validity ratio (CVR) and content validity index (CVI) were measured to quantify the content validity of 17 remaining items and promote content validity of the questionnaire, based on Lawshe method (26, 27). An expert panel using 10 other health professionals was conducted and their opinions were asked about being "essential", "useful but non-essential" and "non-essential" of each item. According to the formula for calculating CVR and content of related table, 3 items did not achieve sufficient content validity to meet 5% probability level for statistical significance and removed. The scores of CVI for each item was computed on the basis of the simplicity, clarification, and relevancy of them. Simplicity was measured by a 4-point Likert scale consists of "quite simple", "simple", "somewhat simple", and "not easy". Specific-

ity was measured by "highly relevant", "relevant", "somewhat relevant", and "non-relevant" also clarity was rated by "quite clear", "clear", "somewhat clear" and "unclear" choices. Acceptable content validity index level for all items were 0.79 (27) and all 14 remaining items had possessed sufficient credit for CVI index.

A pilot study was conducted on 35 adolescent boys (out of study population) for comprehensibility evaluation of remaining items. Participants expressed their opinions about the items via statements of "quite understandable", "understandable", "fairly understandable", and "do not understand". The number of acceptance to the options of "quite understandable" and "understandable" was divided on 35 and coefficient of comprehensibility of each question was calculated. Acceptable criterion for comprehensibility of each item was equal to or greater than 0.7 (27, 28) and all questions met this criterion based on the opinion of 35 members of the target group.

3.4. Reliability and Item Analysis

Reliability of the questionnaire was estimated via internal consistency. In a pilot study, 75 members of the target group (out of study population) completed the questionnaire and intracorrelation and Cronbach α coefficients were calculated. Reliability was evaluated before and after item analysis and repeated after CFA for whole scale and subscales too. Cronbach α coefficient was considered satisfactory when it is equal to or greater than 0.70 (29).

Correlation of each item with total score was evaluated based on data gathered from main study via item-total correlation (ITC) of each item. Cut-off point of ITC for remaining items was considered above 0.30 and below 0.80 (30).

3.5. Factor Analysis

After item analysis, extraction step in EFA was performed by presumption of principle components on sample1 ($n_1 = 360$). Since the suggested questionnaire consisted of types of OE, we choose the promax rotation because of likelihood of correlation between these types. Based on presumption of statistical software, the number of items rotation to establish an appropriate rotational factor were determined as equal to 25 and the present condition of each item in defined factor was chosen as equal to 0.3 (28).

CFA was performed on sample 2 ($n_2 = 360$). Absolute, comparative, and parsimonious fit indexes like minimum chi-square (CMIN), comparative fit index (CFI), parsimonious comparative fit index (PCFI) and root mean square error of approximation (RMSEA) were calculated.

3.6. Data Analysis

Descriptive and analytic statistics of participants, ITC, Cronbach α coefficient and EFA were performed and evaluated using SPSS.v 20 and CFA was operated using Amos Graphic.v 20 software.

3.7. Ethical Issues

- The study started after approval of Isfahan University of Medical Sciences and Isfahan Education organization.
- Ethical approval was granted by the Deputy of Research and Technology of Isfahan University of Medical Sciences (ID: 39147, Date: December 30, 2012).
- The purpose and procedures of the study were explained to the participants, along with researcher's emphasis on confidentiality of data and voluntary nature of participation.
- Parental informed consent and student dissent were considered as inclusion criteria.
- The investigators guaranteed that there were no conflicts of interests.

4. Results

Table 1 presents the main characteristics of the participants. After cleaning the data from missing and out-of-range values, the average PA and LTPA based on MET-Min / Week were found equal to 2315 (SD = ± 1346) and 879 (SD = ± 895), respectively.

4.1. Items Analysis

In the present study, (n = 720) all suggested items except 3, 5, and 6 had ICC more than 0.3 and less than 0.7 ($P \leq 0.005$). According to the results shown in Table 2, these three items were not consistent and were needed to remove from the questionnaire. If absolute value of skewness for an item is greater than 1.96, the skew is significant and that item must be omitted. Tables 2 and 3 show the skewness of each item. There are no evidence for ceiling or floor effect of the questionnaire.

Table 1. Characteristics of 720 Male Adolescents, Participated in Study^a

Variable	Value
Age, y	
15	199 (27.6)
16	259 (36.0)
17	159 (22.1)
18	81 (11.3)
19	22 (3.1)
Family income	
Very Low	22 (3.1)
Low	89 (12.4)
Inter mediate	434 (60.3)
High	138 (19.2)
Very High	20 (2.8)
Missing data	17 (2.4)
Total PA	
Low	51 (7.8)
Intermediate	421 (64.5)
High	181 (27.7)
Leisure time PA	
Low	355 (54.4)
Intermediate	285 (43.6)
High	13 (2.0)

^a Data are presented as No. (%).

Table 2. Item's Total Statistics of Outcome Expectation Questionnaire About Leisure Time Physical Activity in Iranian Male Adolescents

Items Subject	Score ^a	Total Cor- relation	Skewness	Squared Multiple Correlation	α If Item Deleted
EX1: helps me weight control	4.14 \pm 0.87	0.55	-1.28	0.38	0.79
EX2: helps me to get my muscles look stronger	4.14 \pm 0.87	0.46	-1.17	0.32	0.79
EX3: makes me feel fatigue	3.35 \pm 1.11	0.26	-0.13	0.21	0.81
EX4: helps me to Inhibit risk of chronic diseases	4.21 \pm 1.07	0.43	-1.41	0.27	0.79
EX5: leads to spend too much time	3.31 \pm 1.10	0.27	-0.14	0.24	0.81
EX6: leads to spend too much money	3.17 \pm 1.14	0.02	-0.67	0.09	0.83
EX7: improves my body fitness and attractiveness	4.29 \pm 0.86	0.52	-1.46	0.36	0.79
EX8: helps me to be a role model for my friends	3.73 \pm 1.08	0.57	-0.76	0.50	0.78
EX9: helps me to be a role model for my family	3.89 \pm 1.05	0.56	-0.98	0.48	0.78
EX10: helps me to get new friends	3.76 \pm 1.11	0.49	-0.81	0.31	0.79
EX11: improves my ability to perform family and occupational duties	3.77 \pm 1.04	0.55	-0.79	0.34	0.78
EX12: helps me to learn new skills	4.36 \pm 1.24	0.39	-1.51	0.19	0.80
EX13: helps me to decrease depression	4.36 \pm 0.87	0.58	-1.71	0.44	0.78
EX14: improves my self-confidence	4.27 \pm 0.80	0.56	-1.41	0.40	0.79

^a Data are presented as Mean \pm SD.

Table 3. Descriptive Statistics of Outcome Expectation Sub Scales

	Score ^a	Range	Cronbach α	Skewness
Self-evaluation expectation	17.17 \pm 2.67	4 - 20	0.80	-1.40
Social expectation	15.17 \pm 3.28	4 - 20	0.76	-0.65
Physical expectation	12.57 \pm 2.06	3 - 15	0.74	-1.20

^a Data are presented as Mean \pm SD.

4.2. Exploratory Factor Analysis

After deletion of unsuitable items, EFA were performed on half of questionnaires ($n_1 = 360$). In the first step (eigenvalues greater than 1) 2 factors were indicated and all 11 items loaded on these factors. Items 8,9,10, and 11, which were theoretically related to social expectation of LTPA loaded on factor 2, and other items showed significant correlation with factor 1. All recent items were related to physical and self-evaluation expectation of LTPA. Based on theoretical framework of the study, in the second step of EFA, we considered 3 factor solutions (fixed number of factor = 3). In this step of EFA, Kaiser-Meyer-Olkin (KMO) index was equal to 0.908 and the results of Bartlett's sphericity test were significant in the confidence interval of %95 ($X^2 = 1497$, $df = 55$, $P \leq 0.001$). According to the adequacy of sample volume and the proportion of correlation matrix with factor analysis, the data were entered into EFA process. Based on the results of principle component analysis, 3 main factors were extracted. First, second, and third factors described 45.80%, 10.31%, and 7.51% of OE variance, respectively. The total variance described with these factors was 63.64%. Component correlation

matrix showed that direct oblimin method was suitable for rotation ($r_{1,2} = 0.48$; $r_{1,3} = 0.49$; $r_{2,3} = 0.32$).

The items with the numbers of 4, 12, 13, and 14 were loaded strongly on the first factor. The second factor consisted of items number 9, 8, 10, and 11. Finally the items with the numbers of 2, 7, and 1 were loaded strongly on the third factor. Items that were loaded on factors 1, 2 and 3 have related to self-evaluation, social and physical expectation, respectively. Table 4 shows rotated component and structure matrix of items and their correlation with factors.

4.3. Confirmatory Factor Analysis

In order to evaluate the validity of the structure and measuring the available data fitting with major factor, second-order confirmatory factor analysis was performed on sample 2. After determining fitting indexes of default model, scales had acceptable fit to the data (CMIN = 107.39, CMIN/DF = 2.619, CFI = 0.938, PCFI = 0.699, RMSEA = 0.067, PCLOSE = 0.034). the RMSEA, CFI, PCFI and other fit indexes were within the acceptable range and CMIN was significant ($P < 0.001$).

4.4. Reliability of the Questionnaire

In the initial study ($n = 75$), internal consistency of questionnaire was acceptable (α at the initial study = 0.80). The questionnaire has shown excellent reliability on main study too ($\alpha = 0.85$). Internal consistency of each subscale and their descriptive statistics are shown in Table 3.

5. Discussion

This article reports the development process and provides some evidence about psychometric properties of IMAO-PAC questionnaire. Initial questionnaire was developed to evaluate 3 dimensions of OE regarding LTPA in Iranian adolescent boys with 14 items and finally 11 items

Table 4. Rotated Component and Structure Matrix with PCA and Promax Rotation for Items of Outcome Expectation Questionnaire Related to Leisure Time Physical Activity in Iranian Male Adolescents

Number Of Items	Rotated Component Matrix			Structure Matrix			Communalities
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3	
EX4	0.70	*a	*	0.65	*	0.45	0.53
EX12	0.69	*	*	0.76	0.44	0.42	0.60
EX13	0.66	*	*	0.77	0.37	0.56	0.64
EX14	0.65	*	*	0.75	0.42	0.48	0.59
EX11	0.59	0.90	*	0.68	0.58	*	0.57
EX10	0.52	0.82	*	0.62	0.65	*	0.61
EX9	*	0.60	*	0.35	0.83	0.43	0.74
EX8	*	0.53	*	0.43	0.85	0.36	0.73
EX2	*	*	0.78	0.41	0.39	0.81	0.68
EX7	*	*	0.69	0.58	*	0.79	0.68
EX1	*	*	0.55	0.55	0.47	0.71	0.59

^a Asterisk is less than 0.30.

achieved acceptable criteria and remained in the questionnaire.

Development and exploring psychometric characteristics of questionnaires must be supported by a logical, systematic, and structured approach (30). IMAO-PAC has developed and passed evaluation of the psychometric properties in a current popular and logical direction. Yaghmale believes that literature review, comments from experts and targeted population are the most important proceedings to achieve content validity of the measurement tools (31). In the present study, after literature review, recommendation of 10 health experts, out of the research group help us to consider the different aspects of OE related to LTPA and design items in Persian. During the primary study, the members of target group reported their opinion about comprehensibility of the instrument. An expert panel were chosen and presented their recommendation about content and face validity of the questionnaire in a qualitative approach. In addition, affirmative results of CVR and CVI were supported from content validity of IMAO-PAC in a qualitative approach.

ICC of 3 items (items 3, 5, and 6) were lower than 0.30 in the pilot study. This result repeated in item analysis process in the main study; therefore, these items were deleted. Contrary to other items of this questionnaire that focused on the benefits of PA, these 3 items were related to fatigue and spending time and money on LTPA. More investigation showed that fatigue is the most common barrier among sedentary adolescent and young adults. Shortages of time and probably cost of exercise are known as external barriers of PA too (32-35). Today, we know many techniques for overcoming the exercise barriers (32, 36). These techniques were always used in research position. Educational programs about PA in Iran commonly focus on the benefits of PA and most educators emphasize on strengthening of perceived benefits against perceived barriers that may lead to promoting participation of young people in PA (1). It seems that participants' thought reporting negative outcome of LTPA is uncommon, despite self-perception of this barrier. For this reason, they were confused in reporting negative expectation of LTPA.

EFA operated on half of the questionnaires (sample 1) and results supported from a model with 3 factors as expected. These results are similar to the previous studies that considered 3 dimensions of OE. They tested several alternative factor structures and finally suggested a model that was very similar to conceptual framework of this study. Nevertheless, the items related to each dimension were different in IMAO-PAC. For example in our study, weight control, increase body fitness, and look like stronger (items 2, 1, and 7) were loaded strongly on physical expectations of LTPA. Wojcicki et al. expressed that improving "ability to perform daily activities," "overall body functioning," "strengthen of bones," "muscle strength," "weight control," and "functioning cardiovascular system" are main items of physical expectation in middle-

aged and older adults (8). McAuley et al. found similar results in a group of symptom free patients with multiple sclerosis (16).

Cultural and age diversity may make different expectation from LTPA and explain the differences in the result of EFA. Before attainment of 3 factor solutions, items of physical and self-evaluation expectation were communally loaded on one factor. This result is similar to the result of McAuley and his colleagues' investigation. They showed that the 3-factor structure provided a good fit to the data and was a significantly better fit than an alternative 2-factor model. This may well be caused by the relevant expectations of adolescents about LTPA. As Resnick suggested, outcome expectations reflect personal beliefs about social, self-evaluative, and physical consequences of health behaviors (15). On the other hand, the expectations of adolescents are generally physical or social in nature. Some sensations such as "pleasant sensory experiences," "improved appearance," "physical discomfort," and "pain" are related to physical expectation of LTPA. "The ability to spend time with friends," "meet new friends," and "receive positive feedback from others" are common social consequences of LTPA (37). In this study, "becoming a role model for friends and family," "meeting new friends," and "improving ability to perform family and occupational activities" (items 8, 9, 10, and 11) are suggested as main social expectation of LTPA. "Inhibiting risk of chronic diseases," "learning new skills," "decreasing depression," and "promoting self-confidence" (items 4, 12, 13 and 14) were demonstrated as the main self-evaluation expectation of LTPA. Self-evaluation consequence of LTPA inherently correlates with main physical consequence of LTPA (items 2, 1 and 7). This correlation between self-evaluation and physical expectation can justify loading of these items on the common factor.

CMIN, RMSEA, and all of comparative and parsimonious fit indexes showed that default model was satisfactory. This result supported from construct validity of IMAO-PAC. Nevertheless, CMIN was significant ($P < 0.000$) suggesting that modified model may better capture the data. According to the modification indexes, model fit may statistically improves via adding two covariances between error variables of self-evaluation expectation and items 10 and 11. Although adding some regression weight may reduce CMIN and promote its P value above 0.05, this solution was not approved on methodological and theoretical perspective.

Reliability was evaluated in 3 steps by the method of internal consistency. Cronbach α was 0.82 and 0.85 before and after deletion of unsuitable item, respectively. All 3 dimensions of OE possessed good internal consistency (self-evaluation $\alpha = 0.80$, social $\alpha = 0.77$, physical $\alpha = 0.74$). According to the Resnick and her colleagues' study, OEE has acceptable internal consistency in each subscale ($0.87 < \alpha < 0.89$) (15). Wojcicki and his colleagues reported acceptable internal consistency for MOES too ($0.81 < \alpha < 0.84$) (8). This finding was supported by the reliability of

IMAO-PAC suggesting that each subscale evaluates one of the distinctive domains of OE.

To our knowledge, this is the first study, in which psychometric properties of the specific scale for OE regarding LTPA in Iranian male adolescents were introduced and systematically evaluated. One of the strong points of this study was using two different samples to evaluate and confirm construct validity of the questionnaire through EFA and CFA. The significant outcome of EFA was that IMAO-PAC had acceptable construct validity and CFA was performed on sample 2 for determination of model fitness suggested by EFA. Large sample size, multi-stage random sampling and high response rate arising from the presence of one of the investigators during questionnaires filling process were other strong points of this study that increase generalizability of the results. It seems that the main weakness of this study relates to the unsuccessful generalizability of results to the whole Iranian male adolescents, therefore, additional investigation are recommended, especially for evaluation of predictive power of questionnaire in other populations of Iranian male adolescents.

Results of this study provide some evidence for the reliability and validity of the IMAO-PAC and have shown that this new questionnaire can be used to measure the perceived exercise benefits among target group in observational and interventional studies. Further investigation is recommended for evaluating reliability, concurrent validity, comprehensibility and applicability of the questionnaire through supplementary descriptive and interventional studies. Also improvements of the scales are warranted.

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Authors' Contributions

Ahmad Ali Eslami developed the original idea, statistical analysis, and manuscript revision. Mohammad Hadi Abasi collected the data, analyzed them, and wrote the manuscript. Fatemeh Rakhshani revised the manuscript.

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