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Pleasure and Discomfort Scale in Sport (PDSS): Development and Initial Validation

[1]Said Lotfi, [1]Anas El-Jaziz, [2]Hamid El-Jaziz and [3]Abelouahab Tazi

[1]Unity of Research and Assessment in Physical Activity and Sport (REAPS),
Normal Superior School (ENS), Hassan II University of Casablanca, BP 50069, Ghandi, Morocco
[2]Laboratory of Pharmacology, Faculty of Medicine and Pharmacy of Casablanca,
19 Rue Tarik Bnou Ziad, Casablanca, Morocco
[3]The national laboratory for drug controlMadinat Al Irfane, rue Lamfadel Cherkaoui, Rabat, Morocco

Abstract: The aim of this study was to develop and validate the Pleasure Discomfort Scale in Sport (PDSS). A preliminary inquiry using Critical Incident Technique (retrospective analysis) was conducted on 100 subjects and allowed to develop the initial corpus about of pleasure and discomfort situations. The questionnaire was administered at 215 athletes (118 males, 97 females). The internal consistency, internal coherence coefficients and exploratory factor analysis were performed in the data analysis for the new Pleasure Discomfort Scale in Sport. The results showed that the valence pleasure-discomfort Scale in sport activity contained two subscales: pleasure with 10 items and discomfort of 11 items. This scale can be used as a tool of behaviors diagnosis during an athletic program.

Key words: Pleasure · Discomfort · Sport · Validation · Rating Scale

INTRODUCTION

It is confirmed in the literature that during prolonged physical activity, the athletes enhance their self-esteem, wellbeing and enjoyment [1]. However, according to the stress-injury model of Andersen and Williams [2], the competition or intense training, involve the injury perception and the suffering emotion. In the literature, several scales are referred to as measures of affective states, basic predispositions to experience a certain emotion, or to assess emotional disorders: such as Pain Anxiety Symptoms scale (PASS) [3], Pleasure-Displeasure Scale Physics, EPD-P [4] it's interested in several aspects of pleasure-displeasure. However, one of the most known scales in the field of psychometrics there is the Positive and Negative Affect Schedule (PANAS) [5] And the Profile of Mood States (POMS) [6] has certified all the psychometric properties. Contrariwise, these scales may not be very effective with athlete's population because the specific differences of the population are considered as an obstacle to the understanding of the items. However, we have identified some scales: Physical activity enjoyment Scale [7], Sources of enjoyment in youth sport questionnaire [8], Sport emotion questionnaire [9] and Minor sport enjoyment inventory [10]. In the sports field of physical education and exercise, the pleasure is often associated with the construct of intrinsic [11] or flow (optimal experience) [12, 13]. The measure of pleasure is often characterized by limited psychometric procedures.

The valence (pleasure-displeasure) is frequently measured through one or two items [14] like Feeling scale containing single-item contains single item-scale hedonic (pleasure and displeasure), or using subscales (Intrinsic Motivation Inventory [15]; Subjective Exercise Experience Scale [16]. However, as suggested by some authors the use of multi-item tools is a necessary precaution [17, 18]. Other authors have proposed a multidimensional approach. Using the qualitative analysis lived experience of athletes [8, 19]: flow optimal experience, interview, experience and sampling method [20]. The objective of this study was to develop and validate a questionnaire measures the valence pleasure- discomfort in physical activity for young athletes.

Corresponding Author: Lotfi Said, REAPS, Normal Superior School (ENS), Hassan II University of Casablanca, BP 50069, Ghandi, Morocco. Tel: +212 67 80 35 51.

MATERIALS AND METHODS

Subjects: The study was performed on 215 students, comprised 118 males and 97 females (54.88 %; 45.12 %), aged between 17 and 33 years old (mean=20.63±2.64 years). All subjects were engaged in at least two-hour training sessions, five times each week for 3 years, in sport science and physical education curriculum at Hassan II Universality of Casablanca, an practicing different sports (basketball, football, handball, athletics, combat sports) and have participated in university championship competitions.

Description of the Scale: A preliminary inquiry using Critical Incident Technique (retrospective analysis) was conducted on 100 subjects and has generated a 75 items in the initial corpus about of pleasure and discomfort situations [21]. This experience analysis narrative method reduced the biases related to retrospective recall and increased the ecological validity of the observations [20].

The next step was to rectify this initial corpus by a committee of experts and to improve the formulation; clarity and relevance of items and then 14 items did not fit into any of the subscales and were excluded from further analysis. The new scale PDSS consists of 61 items and is divided into two subscales named the valence sensation: the pleasure sensation subscale has 32 items and the discomfort sensation subscale has 29 items. The scale had 4 scoring points (1 - never, 2 - rarely, 3- often, 4 - always).

Data Analysis: We used the method "split-half" (or bisection method) to assess the internal consistency and check the consistency of our questionnaire. The internal coherence of our questionnaire has been validated and evaluated by Cronbach's alpha, usually ranging from 0-1 (the value of the coefficient is at least 0.80). The method of exploratory factor analysis (EFA) was exploited to highlight the latent structure of the data obtained from the first version of the questionnaire. The Extraction of factors and indices of factorial analysis was examined by SPSS-19 and with the extraction method of the type "maximum likelihood" and varimax rotation axes [22].

RESULTS

Exploratory Factor Analysis: Our results showed that the KMO index (Kaiser-Meyer-Olkin) is very satisfying for the PDSS scale globally (0.71) and specifically for the subscale pleasure (= 0.82). While the correlation determinant request to have a reduced value while being different from zero [23]. In our results this index was very low. The factorial analysis (Tables 1 & 2) revealed 11 factors related at discomfort and 10 factors of pleasure situations whose own value was greater than 1 [24] and explaining 62.49 and 59.10% respectively of the total variance, which is a satisfying proportion [25].

Reliability Analysis: We examined the consistency and internal coherence of the subscale of pleasure and discomfort of the whole sample composed of both genders (Table 3). Internal consistency expressed by Alpha was very high above the standard 0.7 While the internal coherence expressed by the correlation coefficient was insufficiently high for the subscale of discomfort (0.47), but high enough for the subscale of pleasure (r = 0.68).

DISCUSSION

The main purpose of this study was to provide a tool to measure the valence pleasure and discomfort in sport and physical activity appropriate to the context of education and sport training. Through an exploratory study we generated the first items of this study.

The scale of the valence pleasure/discomfort in physical activity and sport is a tool to identify the perceptions of athletes of their sport practices and the consequences on their behavior. The PDSS is a tool identifying the perceptions of athletes of their sport practices and the consequences on their behavior. This scale serves as the basis for assessing attractiveness or repellency of subjects to the physical activities.

Little studies have attempted to describe the emotion in action or during an emotional experience in competitions and how they affect the athlete. [26-29].

By examining the various questionnaires used in research in physical activity, we found that the dimensions may be very different inside the same field. Our approach was not based on predetermined factors, as observed in many validations of instruments such as POMS [6] and PANAS [5].

Thus our scale would not apply the same emotional axes usually found in everyday life of ordinary circumstances. But it is specific to our context of physical education (PE) and the sports training with much distinction between emotional categories (beginners, professional and amateur) through a different situation such as: competition, group training, quest for performance... etc. In addition, the researchers emphasized

Table 1: Exploratory factor analysis of subscale: pleasure

	Percentage of variance explained: 59.10 %								
Factors	1	2	3	4	5	6	7	8	9
Contribution	22.46%	6.20%	5.76 %	4.89 %	4.72 %	4.09 %	3.86%	3.70 %	3.42%
PEX10	.717								
PEX4	.713								
PEX8	.696								
PG39	.400								
PR23	.356								
PR42	.345								
PR28		.624							
PC41		.513							
PD21		.501							
PE25		.466							
PP53		.397							
PC63		.360							
PD45		.315							
PP59			.588						
PP60			.524						
PE46			.515						
PE15			.318						
PE14				.634					
PE5				.544					
PE33				.391					
PC50				.383					
PD44					.670				
PD56					.554				
PDL27					.527				
PEX51						.760			
PD64							.420		
PG52							.411		
PP49							.394		
PD26									
PG34								.950	
PE20									.834
PC19									.428

Varimax with Kaiser normalisation, The least .20 values are eliminated

typically the importance of having specific tools adapted to the context (school level, culture, specific context... etc.) sometimes depending of any conformity with other questionnaires dimensions. This explains the multiplicity of such tools in the fields of psychology and education in general.

The heterogeneity of subjects and sports that we have worked during this study (gender, educational level, background, teaching style, class-group typology and sports team) didn't make items suitable perfectly to all circumstances and for all athletics, however, we had two axes that were emerged through the study.

For the components that are summed up in the pleasure subscale, the items define the positive emotions related at self-control, wellbeing, the search for challenge in hard exercises, the positive encouragement, performance feeling and group recognition. Some studies have already shown that emotional states affect cognitive operations [30]. Furthermore, others have shown that they are always some variation with the context and the life situation [31]. While some researchers have shown that physical exercise is an effective actor to reduce negative states (depression, anxiety) to be more positive [32].

For the component of discomfort scale, we summarized it in the feelings of weakness front of others, being responsible of the failure team, achieve and the feeling worry of the difficult and risky exercises and the feeling of physical pain. Some studies have shown that the negative emotional states have some common symptoms, such as insomnia, irritability, difficulty concentrating or fatigue [33]. However others studies [34-36] have shown that the presence of a pretty intense

Table 2: Exploratory factor analysis of subscale: discomfort

	Percentage of variance explained 62.490%										
Factors	1	2	3	4	5	6	7	8	9	10	11
Contribution	12.52%	7.82 %	6.78 %	5.38%	4.9%0	4.74 %	4.63 %	4.49 %	4.17	3.56 %	3.51%
MECH40	.999										
MECH9	.339										
MINF7		.927									
MGN32		.290									
MECH36											
MSPH48			.619								
MII22			.483								
MII11			.466								
MSPH43			.436								
MSPH12			.414								
MSPH35			.402								
MII54			.376								
MII47			.289								
MII13			.214								
MINF1				.583							
MGN62				.511							
MECH17				.384							
MINF61				.314							
MGN2				.250							
MINF29				.234							
MINF16						.422					
MINF24						.378					
MSPH3						-.342					
MGN55							.589				
MII6								.321			
MGN18											
MGN37											
MSPH65										.396	
MECH58										.278	

Varimax with Kaiser normalization. The least .20 values are eliminated.

Table 3: Internal coherence and consistency coefficients of PDSS

Subscale	Items number	Mean ± sd	Internal coherence coefficient	Internal consistency coefficient (cronbach's alpha)
Pleasure	10	3.03±.44	.68	.87
Discomfort	11	2.56±.32	.47	.70
Total	21	2.81±.37	.47	.85

affect in people will encourage them to adopt risky behaviors. These results conform with those of Bonnet et al. [37] who tried to see which are risk activities such as underwater diving (great depth, lack of oxygen, lack of respect to security norms) and concluded that these sports have very high scores of negative emotion that other.

The ratio pleasure-discomfort is a conscious and unconscious instantaneous dynamic, involving mood states regulated by cognitive strategies [38-40]; also it guides the behavior to the involvement or the abandonment.

CONCLUSIONS

The final version of the questionnaire consisted of 21 items including 10 items explaining the statements of pleasure and 11 items explaining the statement of discomfort. The PDSS gave a degree of agreement on a Likert scale with four levels on both subscales: pleasure and discomfort. Each psychological interpretation of score could be developed further, but it did not fall within the scope of this study. Both types of exploratory factorial analysis (EFA) applied to the subscales of PDSS have identified the factors supported by many studies

and theories, demonstrating the construct validity. In fact, our scale can be used as a tool of behaviors diagnosis during an athletic program.

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Final Version of the Scale Measuring Pleasure Discomfort in Sport (PDSS)

Pleasure subscale

1. I feel motivated when I am encouraged by the other sex during a sporting competition.
2. I like to do the extremely hard workouts.
3. I commit without hesitation in the new sports training situations.
4. I feel that the form of my body is nice to see.
5. I feel pride when I had a good athletic performance.
6. I feel the greatness when I adopt a fair-play and self-control attitude during the sports meeting.
7. The applause of the spectators makes me very happy and motivates me to give more.
8. I am motivated when the team climate is positive.
9. I am proud of myself when my sport team is qualified to the next round.
10. I feel the pride when my team recognizes my good athletic performance.

Discomfort subscale

1. I feel despised by others. when I am ranked as the looser in the sports competition.
2. I feel despised when I do not realize the average of the required performance. and ranked among the last in my team.
3. I am concerned to realize the hard and risky exercises in front of spectators.

4. I feel uncomfortable when I realize the difficult workouts that exceed my physical condition.
5. I feel uncomfortable when the coach (or teacher) criticizes my way of the athletic movements.
6. I suffer when I am injured and I fear therefore never cure.
7. I'm embarrassed in my body when I wear some sportswear.
8. I am embarrassed when I feel that I am observed by the opponent.
9. I feel a discomfort when I feel that I am responsible for the failure of my team at a sports competition.
10. I am disturbed when my skills are weak and I am ranked among the last in competitive sport.
11. I suffer a lot when I lose in the athletic competition.