



## Effect of physical perceptions on perceived stress among athlete employees: self-assessment as a mediator

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### Abstract

Stress has become an ingredient of the modern life. This study aimed to examine a model composed of direct and indirect effects with regard to the mediating role of self-assessment latent variable which includes self-efficacy and self-esteem components of physical perceptions construct including physical attractiveness and physical self-worth on perceived stress in athlete employees. This study was conducted using structural equation modeling. The statistical population included all the athlete employees at Tehran Province Gas Company. Among the population, a sample of 187 individuals was selected using simple random sampling method. The reliable and valid instruments were employed. The findings indicated that the direct path in the proposed model should be eliminated and after removing this path, the model's fitness parameters were optimized. According to the data of this research, it can be concluded that exercise effects perceived stress positively in employees primarily due to the improvement of physical perceptions and consequent effect of physical perceptions on perceived stress through increasing the self-assessment construct and its components.

**Keywords:** Athlete, Employees, Physical, Self-assessment, Stress

### Introduction

Stress has become an ingredient of the modern life. Job stress or employees' stress may be related to the factors of work environment or due to the changes in work activities such as new technology or new goals [1]. The Institute of Employees' Compensation in North California of the U.S. has reported that there has been 700% increases in the victims of psychological stress in professional environments between 1979 and 1988 [2].

According to the National Institute for Occupational Safety and Health (NIOSH) of the U.S., psychological stress in employees is observed when there is not a balance between their various needs and their abilities, capabilities, and wishes [3]. In other words, instability between existed expectations from employee in one side, and his/her needs and interests in other side, leads to stress. It seems that main factors in one's perception of stress

are his/her opinions about his personal, family and employment conditions.

By increasing complication of societies in the contemporary world, the key mission of organizations is going to be the realization of society needs. Experts believe that human has the main role in managing an organization and this means that employees are the most valuable capital of an organization, and the performance of each employee is very influential in whole work of organization [4]. Therefore, we have to consider deeply the employees and the main factors affecting their function in workplace to improve organizational performance.

Of course, currently, most of theories such as Michigan model of French and Kahn or transactional theories emphasize that in the examination of stress, one should study the type of person's perception of stress and in other words, the role of individual differences in perception of stress should be considered. So, most of current theories believe that instead of stress measuring, we should analyze perceived stress in people [5]. Perceived stress means that how the life situations of a person are stressful and mixed by inconveniences [6]. Anyway, for promoting employees' performance, we should look for interventional programs in decreasing destructive perceived stress and improving well-being aspects.

The researchers believe that there are various ways to achieve effective control of stress in workplace. To this end, it is believed that sport and physical exercise are the best way which should not be ignored [7]. Therefore, many organizations support home exercise programs and hope to decrease employees' stress. In fact, sport has been recognized as the most influential intervention in job stress [8]. For instance, Lloyd, Hoover, Wheeler, and Blair have examined 854 women and 4416 men in age range of 20 to 83 and the results suggested that physical exercise acts as an excellent protector against stress and depression in employees and besides, individuals' stress is effected by their exercising habits [9].

Despite above mentioned examples about the effective role of exercise in stress of athlete

employees, and despite the results of various researches in the excellence of health and wellbeing and related factors in exerciser employees rather than non-exerciser employees [10-12], there are scant researches that suggest the reason and mechanisms of these positive effects in athlete people. Therefore, current investigations should seek effectful factors and psychological changes that have taken place in exerciser individuals and lead to their psychological excellence. The obtained results in this area may increase organization's motive to expand favored scientific exercise programs for employees.

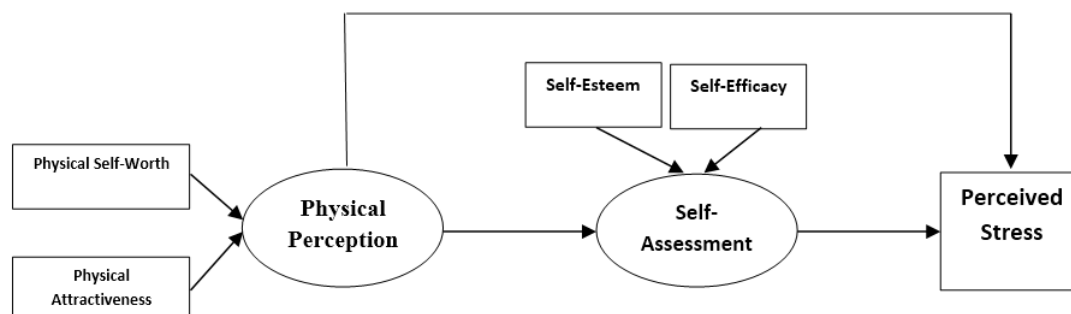
So, this research was designed to demonstrate which psychological factors can explain the favorable effect of exercise on employees' stress. A literature review revealed that one important psychological effect of exercise on persons is changing perceptions and cognitive dimensions [13]. Individual's perception of himself covers various dimensions in life and includes job, family, morality, society, and body [14]. Among these perceptions, physical perceptions (or physical self concept) have special significance. The most considerable aspects of physical perceptions affected positively by exercise are physical self-worth and physical attractiveness [13]. These dimensions are related to psychological features of well-being such as positive compassion and emotional adoption [15].

Therefore, it can be assumed that one of exercise psychological factors in athlete employees that effects perceived stress is the improvement of physical perceptions (physical self-worth and attractiveness). Of course, there are some evidences that physical perceptions of people are strong predictors of preceding variables of self-assessment such as self-efficacy and self-esteem [13,16]. On the other side, self-assessment ingredients have meaningful relationships with employees' stress [17-21]. Therefore, the second hypothesis of this study is that physical perceptions of athlete staff are influential in their self-assessment, i.e. the resultant of self-efficacy and self-

esteem, and eventually can improve the perceived stress.

In general, the main purpose of this research was to examine a model composed of direct

and indirect effects of physical perceptions of exerciser employees on their perceived stress. The assumed model of the research is presented in Figure 1.



**Figure 1** *The proposed model of the study*

It should be noted that according to the studies conducted by the current researchers, the provided model has been studied for the first time in the literature, and most of these studies are correlational or comparative and less examined athlete staff. The main advantages of these studies on athlete jobholders are the application of the obtained results for 1) improving opinions of the personnel of organizations (especially non-athlete ones) on psychological values of exercise, and 2) expanding purposeful and principled exercise programs in an organization. Only in one of previous studies conducted on 312 employees of an information technology corporation, Thøgersen-Ntoumani, Fox, and Ntoumanis were looking for analyzing a model to describe the effect of employees' participation on psychological well-being (self-esteem and life satisfaction) by mediation of precedent variables of physical and occupational well-being (Physical self-worth, body satisfaction, job enthusiasm, and job satisfaction). Among their findings is that physical exercise initially effects physical self-worth and then, physical self-worth affects job satisfaction and eventually, job satisfaction affects the indicator of individual general well-being (general satisfaction) [13].

## Method

This research employed a correlational

method using structural equation modeling (SEM). In the research, statistical population included all employees working at Gas Company of Tehran Province (N=1000). The athlete employee was referred to individuals who have exercised at least for 6 months, had a regular exercise program, and interested in keeping exercise highly to moderate. This definition of athlete staff involves people who are in action, maintenance, and termination stages of Prochaska and Velicer transtheoretical model of exercise adherence [8]. Of course, according to British researcher's recommendations [22], besides above criteria, an employee who exercised at least twice a week for 150 minutes was considered as an athlete one. A short survey was designed by the present authors as "sport background of employees" to gather the above-mentioned information. Persons who reported the level of exercising equal or above the standard levels were selected as athlete employees. Because of the lack of reliable data on the magnitude of athlete persons in the company based on the aforementioned criteria (and knowing only the total number of employees), the least sample size was determined as 181 by considering the population size of 1000 persons in Kerjesy and Moregan diagram. For guarantying the sufficient sample size of athlete staff,

we needed to distribute the questionnaires among 400 workers to include at least 181 athlete employees. Therefore, after required negotiations and correspondences with sports and research experts of the company, 400 cases of research instruments were provided. Then, by determining the location of data gathering from the sample members, and consultation and coordination with related authorities, the questionnaires accompanied with the instructions and phone number of executer were distributed randomly among the participants. After distribution of 400 questionnaires and by consequent screening, it was demonstrated that 187 employees were athlete and the relevant data were applicable for modeling. In the following, the features of research tools are presented:

*Physical Perceptions:* For assessing physical perceptions, the subscales of physical self-worth and physical attractiveness of 25-item physical self-inventory (Ninot, Delignieres and Fortes) were used which are formed as 5 and 3 Likert-scale questions, respectively [23]. This scale is a short French version of the physical self-perception profile (Fox and Cobin) and its original form includes 30 items [23]. In various studies, the reliability of these subscales have been examined by using Cronbach's alpha method, and the coefficients of 0.76 to 0.90 have been obtained and its validity has been evaluated acceptable by factor analysis method [23,24].

*General self-efficacy scale:* This scale has been introduced by Schwarzer and Jerusalem which comprises 10 items [25]. The Cronbach's alpha coefficient has been reported satisfied in various countries. Schwarzer, Schmitz, and Tang calculated the validity of general self-efficacy beliefs scale by examining its correlation to Optimistic attribution style (equal to 0.49) and to challenging perception in stressful situation (equal to 0.45) in a group of students while the validity was proven by the coefficient of 0.58 in a group of teachers with self-regulation [25]. The reliability

and validity coefficients of this tool were obtained respectively as 0.83 and 0.56 in the study of Fuladchang [26].

*Self-esteem Scale:* Self-esteem was measured by the Rosenberg self-esteem scale [26]. The reliability of this tool in the study of Jentile, Towing, and Campbell were reported as 0.76 and the validity was calculated using confirmatory factor analysis and the factor loadings of this scale were reported in the range of 0.61 to 0.87 [26]. In another study, Ghafuri, Khaksar, and Naami calculated the Cronbach's alpha coefficient of 0.76 [27].

*Perceived Stress Scale:* This variable (which has been considered as the central concept) was assessed by the Cohen and colleagues perceived stress scale [28]. The questions of this scale are posed so that the respondents express their opinion about how uncontrollable, unpredictable, and overloaded they find their lives. Its original scale consists of 14 questions; however there are also 4-question and 10-question versions. Amin Yazdi during a research has reported the reliability of this scale by obtaining Cronbach's alpha coefficient equal to 0.81 (which is at an acceptable level) [28].

It is noteworthy to state that the analysis of proposed model was carried out by SPSS-19 and AMOS-20 and for evaluating the mediation effect of the proposed model, the Bootstrap method in macro program of Preacher and Hayes was employed.

## Results

Before the main analysis, several initial analysis was conducted to gain preliminary insight into research data and the mean, standard deviation and simple relationships between four variables were studied.

Table 1 lists the mean, standard deviation, and simple correlations among research variables. Most of these relationships are significant at the level of 0.01. These mutual correlations among the variables in the study provided the overall insight.

**Table 1** Mean (M), standard deviation (SD), and correlation matrix between the variables of the model

		M	SD	PSW	PA	SEF	SES
1	PSW	19.72	3.5				
2	PA	11.43	1.9	**0.36			
3	SEF	38.60	4.9	**0.28	**0.24		
4	SES	39.40	5.4	**0.26	**0.33	**0.52	
5	PS	47.82	5.3	**0.29	**0.26	**0.57	**0.57

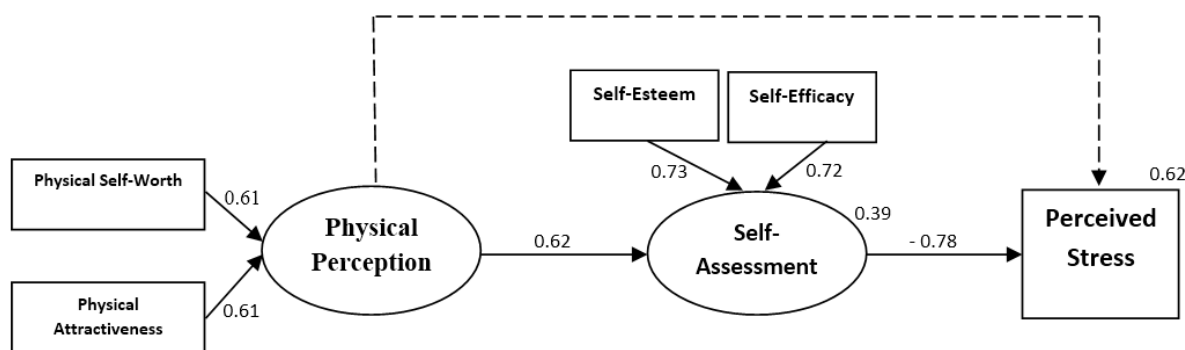
\*\* $\alpha < 0.01$  (Notes: PSW: Physical self-worth, PA: Physical attractiveness, SEF: Self-efficacy, SES: Self-esteem, PS: Perceived Stress)

*Checking the current model hypotheses:* Before examining the structural coefficients, the data fitting quality of proposed model was analyzed. Although the most values of fitness indices were indicative of a suitable fitness, the value of the root mean square error of approximation (RMSEA) indicator showed the model needed to be improved. So, the next step was the promotion of the proposed model fitness through the eliminating the non-significant path (the path of direct effect of physical perceptions on perceived stress) according to the recommendation of the AMOS-20 software. After removing the non-significant path, the RMSEA index of modified model was improved and reached

to the significant extent (0.01). On the other hand, based on the findings of structural equation modeling, the effect size of physical perceptions on perceived stress was 0.62 and thereby 38% of the perceived stress variances were explained by the final model. The results of the model fitness are presented in Table 2, containing model fitness indices such as Chi-square ( $\chi^2$ ), Goodness of Fitness Index (GFI), Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), Normative Fit Index (NFI) and Root mean square error of approximation; and in addition, the final model of the study along with the standardized coefficients of pathways is illustrated in Figure 2.

**Table 2** Fitness indices of the proposed and final modified models

Model	Fitness Indices									
	$\chi^2$	Df	$\chi^2/df$	GFI	IFI	TLI	CFI	NFI	RMSEA	
Proposed Model	14.97	3	3.74	0.97	0.95	0.87	0.95	0.93	0.12	
Final Model	2.8	4	0.93	0.99	0.98	0.97	0.96	0.98	0.01	



**Figure 2** The final model of the study and standardized coefficients of the directions

Path coefficients in Figure 2 is demonstrator of the significant impacts of all directions except direct effect of physical perceptions construct on perceived stress. As a result, the first hypothesis of the study was not confirmed. The results of the

mediating relationship (by using the bootstrap method) are shown in Table 3. The confidence interval for the path mentioned in Table 3 indicates that zero number has not been included at this distance. Hence, the

second hypothesis in relation to the indirect path was confirmed. The confidence level for

this interval was set at %95 and the number of bootstrap resampling was 5000.

**Table 3** *The results of bootstrap approach for the mediating path of the study's model*

Path	Data	Boot	Bias	SE	Lower limit	Upper limit
Indirect path through Self-Assessment construct	-0.27	-0.27	-0.003	-0.06	-0.16	-0.40

## Discussion

As mentioned above, the purpose of this study was to investigate a model consisted of direct and indirect effects of athlete employees' physical perceptions on perceived stress. The findings of this study did not confirm the first hypothesis about the direct effect of physical perceptions (physical self-worth and physical attractiveness) on perceived stress in athlete staff. From this perspective, the results are inconsistent with the findings of Son Strom and Potts or Van de Vliet et al. [15]. In explaining the discrepancy of previous research findings with those of present study, it should be acknowledged that the effect of exercise on relevant aspects of personnel's health and well-being is probably too complicated to be demonstrated by a simple correlational or comparative study. We believe that previous researches have probably tried to reveal that there is a relation between increasing self-perceptions and improving health facets like employees' perceived stress (by exercise) through mere correlations and regressions or prove that physical perceptions and well-being state of athletes is more desirable than non-athletes, but according to the available evidences of current researchers, these studies have paid less attention to whether or not other variables can have mediate or intermediate effects in the abovementioned relationship. Accordingly, the results of this research has been presented as a model to study the simultaneous direct and indirect effects of physical perceptions on stress among athlete employees in order to determine whether the direct effect or indirect effect of body perceptions, improved by exercise, is more permanent on perceived psychological stress.

As a result, a second hypothesis was defined for this study to investigate the intermediate role of self-assessment construct (and its components

including self-efficacy and self-esteem) in the relationship between athlete employees' physical perceptions and perceived stress, the hypothesis that was confirmed in this study. The findings of the research model of Thøgersen-Ntoumani, Fox, and Ntoumanis support the results of this study [13]. In justifying these results, it can be stated that in Fortman's point of view, individual's physical perceptions or in other words his body image is a powerful structure that affects the self-assessment of him [29]. This statement means those who exercise strengthen the favorable emotions and feelings in themselves, which results in valuable insights into the body and physic. This insight would be changed to favorable attitudes on the self-confidence and valuableness, provided the maintenance of exercising over time. Finally, along with forming and strengthening the components of self-assessment, people would be more efficient in dealing with their perceived stress and its related aspects and hence, they can manage their stress in the best way (so long lasting involvement in exercise and sports of interest could lead to the improvement of health and well-being state of staff besides the beneficial consequences for the organization like productivity and profitability).

## Conclusion

In sum, the findings showed that the direct effect of exercise-improved physical perceptions on perceived stress in employees may be an incorrect understanding. Instead, physical perceptions increase self-assessment as a resultant of self-efficacy and self-esteem and eventually improve perceived stress. Thus, the direct path was eliminated in

the final model developed in the present study.  
Limitations and suggestions

First of all, one limitation in this study was the utilization of self-report questionnaires to assess psychological predictors of perceived stress. However, it was a new and creative investigation in its kind in which by linking the subjects of industrial-organizational psychology and sports psychology could open new vision on future researches. If it is possible, we can present the findings of this study on workshops and seminars to individuals to make them believed in not only to involve in exercise programs (against excuses and evade of them), but also to improve these programs by enthusiastic expressing their constructive ideas (and this can be a type of empowerment for employees).

Second, the managers and key officials of the organization should be aware that in addition to planning proper exercise programs for staff, they should provide exercise facilities appropriate for such programs and they are better to participate in exercise programs as the objective sample to staff.

Third, further researches on the other psychological predictors of perceived stress and exercise in such populations may provide some information useful in the development of informative programs to implement in targeted personal interventions to reach the goal of promoting job performance and public health. Forth, considering that the data from this study are the products of a cross-sectional survey conducted on the employees of a particular company in Tehran, the generalization of the results of current study to other groups of athletes and officials needs more reflection and further researches. Therefore, it is proposed that for generalizing the findings of this study, there is a necessity for studying athletic employees from other provinces and/or with different skills and age ranges, and also more comprehensive models be designed as possible and be studied in longitudinal researches (to investigate the impact of exercise kept over time).

Finally, the practical aspect of this study is that if exercise can lead to proper management

of stress in workforce, then most likely it can cause positive job performance and productivity in the organization in long term. So, it is better to consider this issue in future researches.

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### **Contribution**

Study design: MAK, SJ

Data collection and analysis: MAK, KB

Manuscript preparation and edition: MAK, SJ, KB

### **Conflict of Interest**

"The authors declare that they have no competing interests."

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