Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XVIII, ISSUE 2 Supplement, 2018, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

Science, Movement and Health, Vol. XVIII, ISSUE 2 Supplement, 2018
September 2018, 18 (2 supplement): 308 - 312
Original article

COMPARATIVE ANALYSIS OF EXERCISE MOTIVATION OF UNIVERSITY STUDENTS AT DIFFERENT LEVELS OF BODY MASS INDEX (BMI)

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Abstract

Motivation as a psychological feature that arouses and energizes people to action towards physical activity, and also makes them sustain to a physically active behavior. Motivation is a critical factor in physical activity because increased motivation leads to increased participation in physical activity (Tsorbatzoudis et al., 2006). It is a common belief that motivation plays a major role in participation in physical activity (Weinberg & Gould, 2003). The objective of the study was to assess and compare exercise motivation of university students at different levels of body mass index (BMI). 140 undergraduate students Mage 19 ±0.70 years randomly categorized into underweight 37 (26.4%); normal-weight 31 (22.1%); obese 37 (26.4%) and 35 (25%) obese-class III. BMI categories were underweight <18.5 kg/m2, normal weight 18.5-24.9 kg/m2, obese ≥30.00 kg/m2 and obese class III ≥40.00 kg/m2. Exercise motivation was measured through BREQ-2; Markland & Tobin, 2004. The analysis of variance (ANOVA) and Kruskal-Wallis test (depends on the normality of the data) calculated to compare the significance of difference among different BMI categories and post-hoc pairwise comparisons were performed by using Bonferroni correction. Statistical significance was set at 0.05. Normal-weight students' exhibited high scores on intrinsic (3.18±0.8) and identified regulation (3.02±0.69) which reflected as autonomous motivation or self-determined motivation. Significant differences were observed among BMI level on intrinsic regulation ($p = 0.007 < 0.5$); identified regulation ($p = 0.006 < 0.5$); introjected regulation ($p = 0.003 < 0.5$); external regulation ($p = 0.011 < 0.5$) and no difference reported on amotivation ($p = 0.799 > 0.05$). Though normal-weight participants showed high relative autonomy index (RAI) score compare to other BMI categories, but no significant difference was observed. Post hoc pairwise comparison analysis showed that obese-III participants had significantly higher scores on external regulation ($p < 0.05$), introjected regulation ($p < 0.001$) and identified regulation ($p < 0.05$) compared to their underweight peers. The obese group had reported significantly lower scores in the domain of intrinsic regulation ($p = 0.01$) than normal weight group. It was concluded that university students showed high intrinsic and identified regulation which reflected as better autonomous motivation or self-determined motivation. The normal weight students had higher autonomous motivation than underweight and obese students. Obese class students exhibited higher degree of extrinsic motivation and amotivation.

Keywords: Exercise Motivation, Body Mass Index, Physical Activity, University Student.

Introduction

Motivation as a psychological feature that arouses and energizes people to action towards physical activity, and also makes them sustain to a physically active behavior. Motivation is a critical factor in physical activity because increased motivation leads to increased participation in physical activity (Tsorbatzoudis et al., 2006). It is a common belief that motivation plays a major role in participation in physical activity (Weinberg & Gould, 2003).

Being physically active is a lifestyle option for most people and it is important for researchers to discover more about these choices below the wide umbrella of motivation. There is a huge variety of motivation levels between people, starting from the people who have a lack of any kind of motivation to engage in any form of physical activity and ending with the people who exercise for their inherent interest and enjoyment of the activity itself (Dacey et al., 2008). Exercise is defined as the deliberate performance of a physical activity that requires exertion. Specifically, it is recommended that individuals exercise for at least 30 min at moderate intensity for 5 days or more per week to reduce risk of morbidity and mortality (US Department of Health

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* the abstract was published in the 18th I.S.C. "Perspectives in Physical Education and Sport" - Ovidius University of Constanta, May 17-19, 2018, Romania
Received 18 march 2018 / Accepted 6 may 2018

and Human Services, 1996). Additionally, this same report recommends at least 20 min of vigorous intensity activity for 3 days or more per week to additionally maximize aerobic fitness.

Roberts (2001) defines motivation as the investigation of the energization, direction and regulation of behavior. Self-Determination Theory (SDT) provides a framework for the study of motives for physical activity. Deci and Ryan (1985) developed SDT to examine how different types of motivation lead to varying degrees of self-determination. Intrinsic and extrinsic motivation makes up the continuum that distinguishes individual self-determination. Along this continuum, amotivation - the absence of motivation for an activity - is at one extreme and intrinsic motivation - the motivation to do an activity for its own sake or for the pleasure it provides - is at the other extreme, and levels of extrinsic motivation fall between these extremes (Carron, Hausenblas & Estabrooks, 2003; Vallerand & Losier, 1999). These needs form a continuum of internalization from externally regulated motives to intrinsically regulated motives.

The self-determination theory suggests that motivated behavior is based on the satisfaction of three needs; competence, autonomy, and relatedness (Deci & Ryan, 1985; Ryan et al., 2008). Extrinsic motivation leads us to perform to obtain rewards or outcomes that are separate from the behavior itself (e.g., money, sanctions). Intrinsic motivation regulation is when the individual participates for the experience of the activity as pleasant, fun, or satisfying (Deci & Ryan, 1985; Iso-Ahola & St. Clair, 2000; Dacey et al., 2008). An important factor of motivation is physical activity among adult age groups, is health (Ashford et al., 1993; Kolt et al., 2004; Dacey et al., 2008; Murcia et al., 2008; Caglar et al., 2009). In addition to health benefits, appearance (Kilpatrick et al., 2005) and body image (Brudzynski & Ebben, 2010) are motives highly linked to physical activity among young adults. Most of the research that has applied the theory to this domain has focused on either the consequences of self-determined versus controlled motivation (Hagger, Chatzisarantis, & Biddle, 2002). However, most of the key constructs are contained in major contemporary meta-theories of motivation, with Self Determination Theory likely being the most encompassing, and experimentally supported (Ryan & Deci, 2000). Some studies suggested that physical activity is mostly associated with environmental factors and inactivity with socio-demographic factors (Gordon-Larsen et al., 2000). Overall, SDT approach has been shown to be a relevant theory in the field of health care, providing a strong foundation for understanding the goals and motives for recreational exercise as well (Deci & Ryan, 2012; Teixeira et al., 2012).

Obesity is a leading risk factor for premature mortality and numerous chronic health conditions that reduce the overall quality of life. The prevalence of obesity has increased to epidemic proportions in both developed and developing countries during the past two decades, and the condition affects virtually all age, races, and socioeconomic groups and both sexes. Obesity reflects a continued positive energy balance, which is accompanied by unhealthy weight gain and is linked to physical inactivity. The overall obesity prevalence in Saudi Arabia is 35.5%; in other words one in every three people in the country is obese (CADISS, 2005). According to a Forbes magazine reported in 2007, Saudi Arabia with the most overweight people, and was ranked 29th in the world with 68.3% of the population declared as having "an unhealthy weight". Antony and Tomar (2016) it was revealed that 50% male undergraduate students of King Fahd University of Petroleum and Minerals were either overweight or obese. Thus the objective of the study was to assess and compare exercise motivation of university students at different levels of body mass index (BMI).

Methods:

Participants

For the purpose of this study 140 undergraduate students were voluntarily recruited from the King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, Saudi Arabia. The sample categorized into underweight 37 (26.4%), normal-weight 31 (22.1%), obese 37 (26.4%) and the remaining 35 (25%) were in obese-III students. The age of the students were ranging from 17-21 years with mean (SD) 19 (0.70) years. On the basis of BMI, four categories were formed as underweight <18.5 kg/m^2, normal weight 18.5-24.9 kg/m^2, obese ≥30.00 kg/m^2 and obese class III ≥40.00 kg/m^2.

Measures

Exercise motivation was determined by using Behavioral Regulation in Exercise Questionnaire-2 (BREQ-2; Markland & Tobin, 2004). It comprised of 19-item questionnaire that used a 5- item Likert-type rating scale to determine the underlying reasons for people to engage, or not engage in physical exercise, and was developed to measure the continuum of behavioral regulation in an exercise. It measures amotivation, external, introjected, identified, and intrinsic regulation of exercise behavior. The

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reversed items on perceived self-description questionnaire-s (PSDQ-S) were re-coded for the analysis so that higher scores on all items indicating higher perceived competence and more positive self-concept. Domain-specific score for the PSDQ-S and the exercise motivation questionnaire were calculated as the mean score of corresponding items in a domain. A composite index of self-determined motivation, the relative autonomy index (RAI), was calculated using the individual scale average scores as follows: Relative autonomy index (RAI) = +3(intrinsic motivation) +2(identified regulation) – 1(introjected regulation) −2(external regulation) – 3(amotivation). RAI index scores range from −24 (strongly not self-determined) to 20 (highly self-determined). A reliability analysis revealed that the internal consistency values (Cronbach's alpha coefficient) ranged from .70 to .88 for the different regulations for males and females.

Statistical Analysis

The analysis of variance (ANOVA) and Kruskal-Wallis test (depends on the normality of the data) calculated to compare the significance of difference among different BMI categories and post-hoc pairwise comparisons were performed by using Bonferro ni correction. The criterion for statistical difference was set at .05 level of confidence.

Results:

Table 1
Mean (SD) Score and ANOVA of Exercise Motivation Domains

Exercise Motivation Domains	Under-weight	Normal	Obese	Obese-III	p-value
Amotivation	0.71 (0.99)	0.52 (0.58)	0.53 (0.67)	0.41 (0.52)	0.799[+]
External Regulation	0.74 (0.73)	0.82 (0.72)	1.16 (0.8)	1.26 (0.86)	0.011
Introjected Regulation	1.77 (1.03)	2.26 (0.92)	2.15 (0.95)	2.63 (0.88)	0.003
Identified Regulation	2.51 (0.83)	3.02 (0.69)	2.73 (0.74)	3.04 (0.6)	0.006
Intrinsic Regulation	2.57 (0.95)	3.18 (0.8)	2.5 (0.81)	2.76 (0.84)	0.007
Relative autonomy index (RAI)	7.35 (6.6)	10.1 (4.28)	6.88 (5.05)	7.98 (4.96)	0.166[+]

[+]Kruskal-Wallis test was used to compare the score; otherwise ANOVA was used.
Significant at 0.05 level

Table 1 expressed ANOVA highly significant difference among BMI categories on intrinsic regulation (p=0.007<.05), identified regulation (p=0.006<.05) where normal weight students expressed highest (M±SD=3.18±.0.8) and (M±SD=3.02±.0.69) respectively. Whereas, obese class III students significant differed on external regulation (p=0.003) and introjected regulations (p=0.011). No significant difference was observed on amotivation as the p-values were higher than .05 levels. Though a high average relative autonomy index (RAI) score was observed among normal-weight participants compared to other BMI categories, the difference was not statistically significant (p- value =0.166).

Figure 1 shows the graphical representation of the domain scores of exercise motivation among students at different BMI levels.

Figure 1
Mean score of Exercise Motivation on BMI Levels

Table 2

Post hoc pairwise comparison (with Bonferroni correction) of Exercise Motivation Domains between BMI categories (A - underweight, B - normal-weight, C - obese and D - obese-III)

Exercise Motivation Domains	Under Weight (A)	Normal Weight (B)	Obese (C)	Obese III (D)
External Regulation				A(.028)
Introjected Regulation				A(.001)
Identified Regulation		A(.026)		A(.014)
Intrinsic Regulation		A(.024) C(.009)		

The results are based on two-sided test assuming equal variances. For each significant pair, the key of the smaller category appears in the category with larger mean.

Significant at 0.05 levels

Table 2 represents the results of post hoc pairwise comparison (with Bonferroni correction) of exercise motivation domains (BREQ-2) between BMI categories. Post hoc pairwise comparison analysis showed that obese-III participants had significantly higher scores on external regulation ($p < 0.05$), introjected regulation ($p < 0.001$) and identified regulation ($p < 0.05$) compared to their underweight peers. Underweight participants had reported significantly lower scores in the domain of identified regulation ($p < 0.05$) and intrinsic regulation ($p < 0.05$) than their normal-weight peers. In addition, obese group had reported significantly lower scores in the domain of intrinsic regulation ($p = 0.01$) than normal weight group.

Discussion:

It is widely accepted that adolescent obesity is becoming increasingly prevalent in many countries, including Saudi Arabia. The objective of the study was to assess and compare exercise motivation of university students at different levels of body mass index (BMI). The results of the study suggested that highest mean scores of normal weight students on intrinsic and identified regulation is reflected on their better autonomous motivation or self-determined motivation. Obese class III showed higher degree of amotivation. The findings are consistent with self-determination theory (SDT) that explains, motivation behaviour is viewed on a continuum ranges from amotivation (lack of motivation) - to extrinsic motivation (externally-controlled motivation) - to intrinsic motivation. High scores of intrinsic regulation and identified regulation exhibit higher intrinsic motivation (Deci and Ryan, 1985). According to Power et al., 2011 adolescents who were intrinsically motivated for physical activity were more fit and thereby less likely to be obese. Internal regulation was more significant for physical activity in normal weight adolescent (Hwang and Kim, 2013).

Conclusion

It was concluded that university students showed high intrinsic and identified regulation which reflected as better autonomous motivation or self-determined motivation. The normal weight students had higher autonomous motivation than underweight and obese students. Obese class students exhibited higher degree of extrinsic motivation and amotivation.

Acknowledgement

The Authors likes to thank the participants and the support provided by Deanship scientific Research at King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia, under Research Grant (IN151029).

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