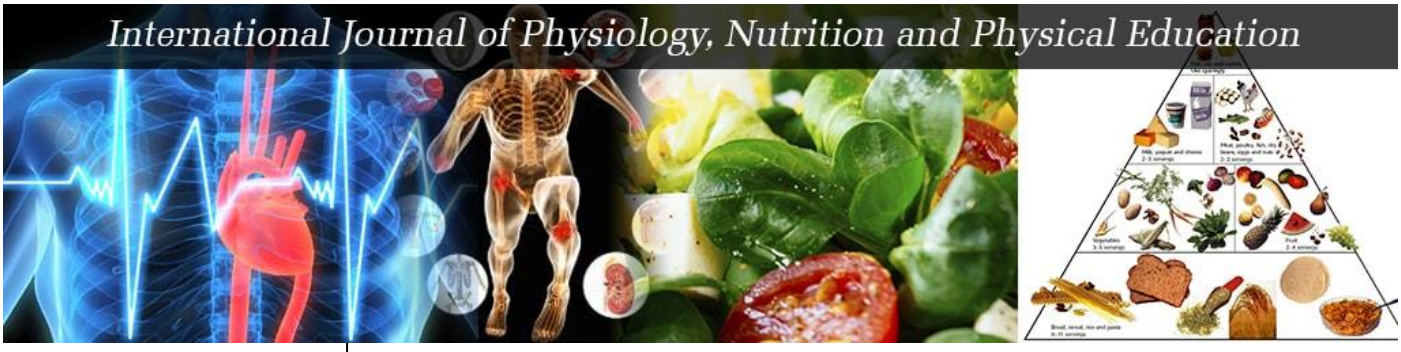

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A push for public health: Effect of cycling on selected psychological variables among adolescents online video gamers

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Abstract
Video gaming is a popular leisure activity among adolescents. Video gaming is known to have some benefits such as improving focus, multitasking and working memory, but it may also come with costs when it is used heavily. The degree of addictive video game use has been found to be related to personality traits such as depression, anxiety stress and aggression and low self-esteem in players, affecting them both psychologically and physically. Studies proved that aggression and anxiety were particularly prominent among adolescents addicted to electronic gaming and aerobic exercise is found to be worth encouraging for anxiety disorders. A growing body of evidence indicates that regular aerobic exercise improves psychological as well as physical health. Previous studies have confirmed that cycling can increase positive emotions and improve behavioral pattern. In this study the investigator analyze the effect of cycling on psychological variables such as stress and aggression. For the purpose of the study sixty subjects (N= 60) were randomly assigned to either experimental group or control group (mean age 17.7 ± 1.8 years). The experimental group (n=30) underwent outdoor cycling training programme for a period of sixteen weeks, whereas the control group (n=30) maintained their regular routine activities. The training load was gradually increased up to 10% per week. The subjects of both the group were tested their anxiety and aggression 24 hours before and after the period of experimentation. Data was collected from each subject before and after the training. The data was statistically analyzed by using analysis of covariance and data was analyzed in SPSS statistical computer package. To find out the significant difference between groups ANOVA was used. The results of the study showed that there was significant difference among the adjusted post-test mean of experimental group and control group.

Keywords: Cycling, anxiety, aggression, adolescents, video gaming

Introduction
Video gaming is an extremely popular leisure-time activity among adolescents, since 1970's. Video games are defined as interactive electronic games which aim primarily to entertain players. (Anderson, C. A., and Bushman, B. J. (2001) [1]. There are many types of video games that are played around the world like action, adventure, fighting, platform, racing, roleplaying, shooter, simulation, sports and strategy. Every video game has different characteristics from other video games, which make some of them more popular than the others. Video gaming is known to have some benefits such as improving focus, multitasking, and working memory, but it may also come with costs when it is used heavily. By spending a predominant part of the day gaming, excessive video gamers are at risk of showing lower educational and career attainment, problems with peers, and lower social skills. Several studies, literature reviews, and meta-analyses have underscored the potential dangers of excessive video gaming. (Anderson, C. A., & Dill, K. E. (2000) [2] The degree of addictive video game use has been found to be related to personality traits such as depression, anxiety stress and aggression and low self-esteem in players, affecting them both psychologically and physically. Excessive game playing caused physical ailments including cardiovascular stress, wrist pain, issues with sleep and the nervous system and reduced physical activity (DiLorenzo TM. *et al.* (1999) [4, 15]. The effects of violent video game play impact early, middle, and late adolescents, the influence of violent video games should be more pronounced in early adolescence than in middle and late adolescence.

Roberts, Foehr, Rideout, and Brodie (1999) found that older children and adolescents (8- to 18-year-olds) play video games, on average, between 1.2 and 7.5 hours per week.

Video games can impact on developing certain human behaviors, whether these behaviors are good or bad. Due to the continuous needs of development in the video games and their techniques, the concerns of using these games are increased. (Cesarone, B. (1998) [3].

Many video games are violent in nature and feature death and destruction. In addition, it is shown that the majority of players are children or adolescents, which leads to change the assumption about video games to be just for entertaining or for time-consuming. Dietz (1998) found that 80% of the most popular video games on the market today are violent in nature**.**

Griffiths (1999) [14] identified nine different types of video games sport simulations, racers, adventures, puzzlers, plat formers, platform blasters, beat 'em ups, shoot'em ups and weird games. Although not all video games contain violence, research by Funk and Buchman (1996) suggests that adolescent boys and girls both prefer violent video games. Violent video games negatively influence socio-emotional functioning during the adolescent period and the excessive exposure to violent video games directly leads to an increase of aggression (Anderson & Bushman, 2001) [1].

Similarly great concern has been raised that video game violence may have a greater adverse effect than television violence on children because of the child's active involvement; i.e. television watching is only a passive, one-way communicative medium whereas video game playing is a two-way active communicative medium. On the one hand, video game use is widespread, and it may come with certain precursors as well as consequences. On the other hand, little is known about the relations between various video gaming habits and psychological functioning.

Impact of video games have been studied by many researchers in the fields of computer science, psychology, education and youth studies. These studies also investigate whether the video games have an effect on the player behaviors and emotions during playing the game or after completing the game, for either short time or long time. Anxiety and aggression are the greatest problems of modern trends in scientific knowledge. Anxiety refers to that emotional state of mind where a fear of danger of loss of suffering is a prominent feature.

It generally arises as result of fear for something unknown which creates tension and disturbance. Aggression is the international response of a person to inflict pain or harm a person. (Gustafson R. (1989) [8] Over the years two basic kind of aggression have been identified hostile aggression and instrumental aggression.

These two types of aggression are distinguished in terms of their primary reinforces or in terms of the goal being sought. Mr. Weaker, in both cases says the intension is to harm another human being. If this is not the case then the behavior is aggression. For individual engaged in hostile aggression, the primary goal is the injury of other human being. Individual engaged in instrumental aggression also intend to harm target. So both the psychological variables effect in the performance of human beings. (Sherry, J. L. (2001) [13].

Sports psychology is concerned with the total wellbeing and personal adjustment of those involved in sports. Studies conducted to find the relationship between physical exercise and mental health have recently become extremely popular in the research area of health psychology. Regular exercise aerobic exercise can have a profoundly positive impact on depression, anxiety, and ADHD. It also relieves stress, improves memory, helps you sleep better, and boosts your overall mood (Salmon, P. (2001) [12]. Aerobic exercise has been defined as "physical work sustained for long periods (e.g., cycling, distance running or swimming), with training designed to increase the efficiency of the oxygen transport system" (de Coverley Veale, 1987) [5].

The aerobic exercise can be good for the brain as it helps to maintain blood flow to the organ providing it with a supply of nutrients and oxygen. People who exercise regularly often find that their judgment, learning and thinking remains sharp as they age. Research accumulated over the past two decades indicates that regular aerobic exercise is associated with a variety of positive physical and mental health outcomes, including reductions in anxiety and depressive disorders (de Moor, Beem, Stubbe, Boomsma, & de Geus, 2006; Fremont & Craighead, 1987) [6].

Several studies also have reported the psychosocial benefits such as reduced anxiety, feeling of stress, depression, fatigue; improved alertness, concentration, mood, energy level and resistance to infection; improved appearance confidence, self-esteem; as well as increasing social contact and enjoyment associated with moderate aerobic exercises like walking cycling, slow jogging.

Studies have found that the combination of exercise and exposure to the outdoors is a bit of a magic combination for emotional and mental health (Salmon, P. (2001) [12]. Aerobic exercise like outdoor cycling is considered to be an effective treatment for anxiety and other psychological disorders. Stationary cycling exercise has been shown to decrease the amount of anxiety in obese adults.

It appears that low- to moderate-intensity exercise is best for overall anxiety reduction, while an exercise intensity level that is too high may not be of as much benefit. (Mehroof, M., and Griffiths, M. D. (2010) [14]. Previous studies have confirmed that cycling can increase positive emotions and improve brain wave patterns are worth encouraging for anxiety disorders. (Thomas M. DiLorenzo. *et al*. (1999) [4, 15]. The rhythmic, aerobic and low impact nature of cycling has known brain boosting benefits.

Statement of the Problem

The purpose of the present investigation is to find the effect of outdoor cycling on selected psychological variables among adolescent video gamers.

Objective of the Study

1. To study the effect of outdoor cycling on the anxiety level of adolescent male and video gamers
2. To study the impact of outdoor cycling on aggression among adolescent male and female video gamers.

Methodology

Sixty boys and girls with an age group ranging from 16-19 years were conveniently selected from Alapuzha district, Kerala as subject. To establish the nature of relationship between the outdoor cycling and the study variables, the following methodology was used.

Selection of the Subjects

Participants were 60 adolescents studying at different schools in Alapuzha district, Kerala. A convenient sampling method was used for the selection of participants. All the participants were male students. A total of 60 of the participants (32.4%)

were in plus one classes, (27.4%) plus two classes, and (40.2%) in degree classes. The age ranged from 16 to 19 years and the mean (±SD) was 18.89 (±1.05) years. In all, (28.3%) students preferred sport games,(7.2%) preferred strategy and intelligence games, (18.7%) preferred adventure and action games,(9.4%) preferred war and shooting games, and (5.9%) students preferred card games.

Selection of the variables for the Study

After a thorough review of literature relevant to the electronic games found in books, journals, periodicals, and research articles besides detailed discussion with the experts and keeping in view feasibility of the study in terms of availability of subjects and the relevance of the variables to the present study, the following dependent variables selected for the present study are Anxiety and Aggression.

Instruments

1. To find out the anxiety of the experimental and control group, a standardized test devised by R. Martens and D. Gill was used.
2. To find out the aggression of Experimental and control group a test which was devised by Tiwari and Chauhan was used

Procedure

Permission for conduct was obtained from school authorities. Participation was anonymous and voluntary. The researchers applied the scale and if any question from students arose about the questionnaire, the investigator gave information and assisted the participants.

For the statistical analyses, analysis of covariance was applied to evaluate how well variables predict the effect of outdoor cycling among the subjects. These analyses were performed via SPSS 20.

Methodology

Sixty sedentary boys aged from 16 to 19 were selected as subjects. The (n=60) subjects were randomly assigned to either Control group (n= 30) or Experimental group, (n=30). Anxiety and aggression were tested 24 hours prior and 24 hours after the training programme.

The experimental training (outdoor cycling) for a period of sixteen weeks, whereas the Control group maintained their regular routine activities. The subjects of both groups were tested by Questionnaires on selected psychological variables before and after the periods of experimentation.

The criterion variables selected for this study were anxiety and aggression. The experimental group underwent an endurance training programme for sixteen weeks. The training duration was increased from 30 minutes to 55 minutes per session including a 5 minute warm up and flexibility routine and a 5 minutes warm down phase.

The volume rather than the intensity of the training programme was considered of prime importance to induce beneficial changes in the subjects. It is recommended a frequency of 3 training sessions per week to evoke significant training effects. But to achieve positive response the activity was extended up to 5 sessions per week during the latter half of the training programme.

The duration of exercise sessions and frequency of training were expressed by the term 'Bi weekly Load Training'(BWLT) time spent at the prescribed activity at the prescribed intensity per week.

The number of sessions per week, duration of the sessions and the corresponding WLT are given in table I

Table 1: Training schedule with weekly load of training

Weeks	No. of Training Sessions	Training duration of the session(min)	Biweekly load of Training (BWLT)
1&2	6	30	180
3&4	6	35	210
5&6	6	40	240
7&8	8	40	320
9&10	8	45	360
11&12	8	50	400
13&14	10	50	500
15&16	10	55	550
TOTAL	56		2760 min

Mean training duration per session = 49.29 min.

To find out the anxiety of the experimental and control group, a standardized test devised by R. Martens and D. Gill was used. It consisted of 15 statements among which 5 statements were not scored. The statements 2, 3, 5,8,9,12,14 and 15 were scored as 1,2,3 for hardly ever, sometimes and often respectively. And the statement numbers 6 and 11 were scored as 3,2 and 1for hardly ever, sometimes and often respectively. The statement numbers 1, 4,7,10 and 13 were not scored.

To find out the aggression of Experimental and control group a test which was devised by Tiwari and Chauhan was used. It consist of 10 statements and each item has five answers from very much" to "not at all" a score of 5 was given to the response every much, 4 for "much" 3 for "ordinary", 2 for "less", 1 for "very less" and 0 for "not at all". The high score indicates that the score present of more aggression and the lowest score indicates no aggression. The items that measure aggression are 4, 8, 12, 16, 20, 24, 28, 32,36 and 40.

The score obtained for anxiety and aggression were added together and considered for the statistical treatment. The questionnaire one contains 15 statements regarding the way one behaves, feels and act in sports competition. Each statement is given with three responses namely hardly ever, sometimes and often. The questions are detailed. 1. competing against others is socially enjoyable. 2. Before I compete I feel uneasy.3, before I compete I worry about not performing well 4. I am a good sportsman when compete .5, When I compete, I worry about making mistakes. 6. Before l competes I am calm.7. Setting a goal is important whencompeting.8. Before I compete, I get an uneasy feeling in my stomach.9. Just before competing I notice my heart beats faster than usual 10. I like to compete in games that demand considerable physical energy.11.Before I compete feel relaxed. 12. Before I compete I am nervous.13, Tea am sports are more exciting than individual sport. 14. I get nervous wanting to start the game. 15. Before I compete I usually getup tight.

The questionnaire two contains 10 statements, each question contains six answers. The questions are detailed.

1. How far is it good to break social tradition when need arises? 2. How much anger do you experience when people do not except even reasonable things? 3. How much do I like to be a dashing and fearless leader? 4. How much do I like bloody warriors fighting in a pitched battle? 5. How far do I believe in the policy of tit for tat? 6. How much do I find myself possessed with incidence of anger in day-to-day life situation? 7. How much do I like to keep in my room, a picture in comparison to others depicting a warrior soldier with a naked sword ? 8. How much do I like to have pitched discussions? 9. How much would I like to contest in

elections? 10. How much do l like reading biographies of revolutionaries? The data collected from experimental and control groups prior to and after completion of training period on selected variables were statistically examined for significant differences if any, by applying analysis of covariance. The data was analysed in the computer using 'SPSS' statistical package. The level of confidence
was fixed at 0.05 level of significance as the numbers of subjects were limited and also as the selected variables might fluctuate due to various extraneous factors.

Analysis of the data and result of the study

1able-1 shows the anxiety and aggression among experimental and control group before and after the training period. There was significant reduction in anxiety and increase aggression ($P< 0.05$).

Table 2: Analysis of covariance for the selected psychological variables among experimental and control group

		Exp Group	Con Group	SOV	SOS	df	MS	F-ratio
Aggression	Pre-test	19.10 (3.24)	19.63 (2.80)	B	4.27	1	4.27	.46
				W	531.6	58	9.17	
	Post –test	17.90 (2.47)	19.50 (2.69)	B	38.40	1	38.40	5.77
				W	386.2	58	6.66	
	AD-PO TEST	56.89	56.34	B	20.80	1	20.80	19.76
				W	59.99	57	1.05	
Anxiety	Pre-test	26.20 (4.86)	26.80 (4.61)	B	5.40	1	5.40	.24
				W	1301.6	58	22.44	
	Post-test	27.00 (4.23)	26.80 (4.44)	B	.60	1	.60	.03
				W	1000.8	58	18.81	
	AD PO Test	26.09	26.90	B	9.84	1	9.84	
				W	98.03	57	1.72	

Significant at 0.05 level.

Table-1 shows that the pre-test means of anxiety among experimental group (19.10+3.24) and control group (19.63+2.80)resulted in an T-ratio of 46 which indicates no significant difference The post-test means of anxiety among experimental group (17.90+2.47) and Control group (19.50 +2.69) resulted in an f-ratio of 5.77 which significant at 0.05 level of confidence, whereas as the adjusted post means of Experimental (19.98) and control groups (18.75) resulted in an 'f-ratio of 19.76 which was significant. This indicated that there was a significant change in Anxiety among experimental group when compared with the control group.

Table-I shows that the pre-test means of aggression among experimental group (26.20 +4.86) and Control group of 26.80 + 4.61 resulted in an f ratio of .24 which indicates no significant difference. The post-test means of aggression among experimental group (27.00+4.23) and control group 26.80+4.44) resulted in an f ratio of .03 which was significant whereas the adjusted post-test means of experimental (26.09) and control group (26.90) resulted in an ‘f’ –ratio of 5.72 which was significant at 0.05 level of confidence. This indicates that there were significant changes in aggression among experimental group when compared with the control group.

Conclusion

The outdoor cycling resulted in a significant reduction in anxiety and also a significant increase in aggression in the Experimental group when compared with the control group.

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