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Presumptive General Physical Activity, Psychological Distress and Autonomic Activity

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The present investigation aims at studying the effect of presumptive general physical activity pattern on the general well being, including psychological component. The sample consists 60 male students (3 groups of 20 students each) having age range from 19 to 23 years. In order to vary the variable of general physical activity (motor), a sub sample of sportsmen, regular exercisers and an age matched control group (with routine activity pattern) were selected. A battery of psychometric and physiological measures was administered on the subjects. The measures were Activity as Temperamental trait (Tempo and Vigor), Psychological Distress measures (General health, Anxiety and Depression) and Physiological measures (B.P., Pulse rate, Skin and Body temperature and Body Mass Index). The measures were administered in a relaxed wakeful condition in the evening hours. Physiological measures were obtained with the help of digital/electronic instruments. The findings revealed that the presumptive general physical activity significantly affected the anxiety component of general well being. However, on rest of the measures, the groups did not differ among each other. Regular exercise group was found to be having the least anxiety in comparison to sportsmen and control group. The groups were comparable on temperamental activity, basal autonomic measures and body mass index. It is concluded that health maintaining exercise (voluntary) reduces the general anxiety, whereas motivated practice of the sportsmen was comparable to the control group.

***Keywords**:* Psychological Distress, Anxiety, Autonomic Activity, Physical Activity (Motor).

Activity is defined as the amount of energy expanded in body movements, e.g., climbing ropes, pumping vigorously on a swing, riding bicycles etc. The energy expanded is physical involving prolonged concentration that may induce fatigue (Buss, 1995). Exercise is the performance of movements in order to develop or maintain physical fitness and overall health. Frequent and regular physical exercise is an important component in the prevention of some of the diseases of affluence, i.e., cancer, heart disease, cardiovascular disease, diabetes, obesity, etc. Exercises are generally grouped into three types on the basis of their global effect on the human body. These are : (i) Flexibility exercises such as stretching improve the range of motion of muscles and joints. (ii) Aerobic exercises such as walking and running focus on increasing cardiovascular endurance and muscle density. (iii) Anaerobic exercises such as weight training or sprinting increase muscle mass and strength.

Physical exercise is considered important for maintaining physical fitness including healthy weight, building and maintaining healthy bones, muscles and joints, promoting physiological well-being, reducing surgical risks and strengthening the immune system.

Activity encompasses two components in terms of expanding energy, i.e., Tempo and Vigor. Tempo. It involves a rapid rate of

responding. People at the low end of this trait tend to speak deliberately and maintain a slow pace of life. They are labelled as lethargic, sluggish and dull by high tempo people. Vigor : An alternative means of expanding energy is through vigor. Vigorous responses are of greater amplitude or intensity e.g. talking loudly, pushing open doors with great force. Vigorous people prefer sports that involve great strength or endurance such as weight lifting, swimming etc.

Highly active people need to exp and energy, whether through tempo or vigor. In brief, there is a motivational component at the high end of the activity dimension; active people become frustrated if they cannot release their profligated energy.

Achieving a state of health is an important goal at the individual as well as societal levels of human functioning. However, the meaning of health is construed dif ferently across different cultures (Da sen, Berry & Sartrius, 1987; Sinha, 1987). Majority of practitioners describe meaning of health in terms of well being, fitness and healthy condition of an individual. Though the amount of energy expanded is physical whenever performing some vigorous physical exercise but its prolonged concentration induces the mental fatigue too affecting the general well being of a person.

The World Health Organisation (WHO) (1990) defines health as a st ate of complete physical, social and mental well being and not merely the absence of disease or infirmity. Mental health is about a sense of well being and living a life as fully as possible. Combination of physical, social , economic, psychological and emotional factors influences well being throughout life. Viney & King (1998) quoted William James views that our muscular vigor will always be needed to furnish the background of sanity and cheerfulness to life, to give moral elasticity to our dispositions, to round off the wiry edge of our fretfulness and make us good humoured.

Distress as a construct in terms of it s conceptual meaning refers to the negative component of p sychological well being as relatively easily assessed though self reports of anxiety, depression, frustration etc. In the present investigation, this construct of 'Psychological Distress' has been measured operationally by General Health Questionnaire (GHQ-12) developed by Goldberg and Hillier (1979). It has three components, i.e., anxiety, depression and general health.

Anxiety is a general feeling of apprehension about possible danger. Sometimes it seems evident in those who are obviously fearful and nervous. It is more concerned with the cognitive and behavioural components. Depression measures the feelings of unhappiness, worthlessness, helplessness and disappointment.

Depression is also a major problem in today's scenario. In general, depression is a basic affective state characterized by symptoms such as lower self esteem and feelings of being rejected or being unloved, which can be found in all age groups.

Beck and Beamesdefer (1974) suggest that characteristic s of depression include pessimism, sense of failure, self dislike, social withdrawal and somatic and somatic pre-occupation. Depression, anxiety and self-esteem have been closely related in clinical, empirical and theoretical studies of psychopathology (Gurney, Roth & Gorside, 1970).

A depressed person lacks confidence, courage, liveliness and is u nable to enjoy . People with severe depression have suicidal ideas and keep thinking about death. General health deals with the person's emphasis to the psychological, physical and social problems over the past few weeks.

Landers & Petruzzello (1994) examined the results of 27 narrative reviews conducted between 1960 to 1991 and found that 81% of scientists concluded that physical activity was

related to anxiety reduction. Rest 19% of investigators found some divergent results. Number of other social scientist s (Calfas & Taylor, 1994; Kugler, Seelback & Kruskemper, 1994; McDonald & Hogdon, 1991) made meta-analyses and found the larger effects of exercise on anxiety reduction. Similarly number of empirical evidence (Katon & Schulberg, 1992; Craft, 1997; Meyer, Broocks, Vogee & Ruther, 2005) show the buffering impact of physical exercise on lowering down the depression. Though the review of literature of these variables show the relationship between physical activity and anxiety reduction; and physical exercise and depression. But there is a dearth of empirical evidence of the relationship between physical activity, psychological distress and autonomic activity.

Taking these variables into account, the objective of the present study is to investigate the impact of presumptive general physical activity pattern on the psychological distress and autonomic activity. Presumptive general physical activity was taken as experiential in regular way at least for a year in terms of some exercise/sports activity.

Method

Design:

It is a multi-group design study where the variable of physical activity was varied at three levels, i.e., motivated physical activity practice group, regular exercise group and control group.

Sample:

The sample consisted of 60 male students, having age-group of 19 to 23 years. The sample was divided into three equal groups (each group having n=20) i.e., Group-I constituting sports persons, Group-II encompassing regular exercisers and Group-III an age matched control group.

Measures:

Buss and Plomin's (1998) Temperamental Questionnaire : It measures four different components of temperament, i.e. Emotionality (E), Activity (A), Sociability (S) and Impulsivity (I). The component of activity involves further two parameters, i.e. Vigor and Tempo. Each of parameter has five items separately in the questionnaire.

General Health Questionnaire (GHQ, 1979) : GHQ developed by Goldberg & Hillier was used to measure psychological distress. The scale consisted of 23 items (7 items for anxiety, 7 items for depression and 12 items of GHQ (3 items overlapping). It is a foupoint rating scale with scores 0 to 3 giving due weightage to positive and negative connotations. It is a self administered screening test, designed for detecting non-psychotic psychiatric disorders.

General Physiological Measures such as height, body weight, blood pressure, skin temperature, body temperature and pulse rate were taken with the help of digital/electronic instruments. Body Mass Index (BMI) was calculated by the following formula (Bray , 1987).

Results and Discussion

The scores obtained on the questionnaire were processed for more meaningful results by calculating the respective means and SDs (Descriptive) separately for three different groups, i.e., Motivated Performance Group (G-I), Regular Exercise Group (G-II) and Control Group (G-III) on thirteen different psycho-physiological measures, i.e., Activity, Tempo, Vigor, Pulse rate, Diastolic Blood Pressure, Systolic Blood Pressure, Skin conductance, Body temperature, Body Mass Index (BMI), General health, Anxiety, Depression and Global Psychological Distress. These results are given in Table 1. t-test was applied to find out the difference in means amongst these groups varying in nature of physical activity.

Table 1 Mean and SD of Performance Motivated Group (G I), Regular Exercise Group (G-II) and Control Group (G-III).

	Variables	G-I		G-II		G-III	
		Mean	SD	Mean	SD	Mean	SD
1	Activity	31.18	7.41	31.85	9.1	29.1	5.74
2	Tempo	15.83	4.29	16.05	4.38	14.5	4.75
3	Vigor	15.35	4.49	15.8	5.68	14.6	3.39
4	Pulse Rate	74.88	9.27	72.75	10.89	75.95	5.76
5	Diastolic Blood Pressure (D)	127.83	24.22	134.15	29.55	120.55	19.94
6	Systolic Blood Pressure (S)	84.91	16.84	88.2	22	87.1	15.63
7	Skin Temp (C)	27.83	1.5	28.27	2.02	27.38	0.6
8	Body Temp.	98.34	0.39	98.36	0.4	98.31	0.15
9	Body Mass Index	22.58	3.01	22.1	2.82	23.21	3.88
10	General Health	11.43	5.36	10.8	6.2	11.35	5.53
11	Anxiety	6.6	4.26	4.95	3.64	9.3	5.52
12	Depression	3.38	2.4	2.8	2.04	3.8	2.54
13	Global Psycho-logical Distress	18.8	10	15.65	12.77	21.5	6.21

Table 2 shows the F-ratios of these respective parameters. Table 3 shows their t-values along with their respective means and SDs. Simple ANOVA was done to analyze the source of variance in those thirteen p sycho-physiological measures.

The results in Table 1 showing descriptive i.e., and s did not show much difference in their means values in relation to the parameter of activity as the regular exercise group showed highest mean, followed by motivated performance group (motivated for state sports level) and lowest mean value of control group who is not involved in any kind of physical activity. Their respective means were 31.85, 31.18 and 29.10. The same trend was observed in case of their standard deviation scores also.

Further, the dimension of anxiety showed different trends in case of three different groups as control group showed highest anxiety mean scores, i.e., 9.30, followed by motivated performance group, i.e., 6.60 and the lowest anxiety score in regular exercisers, i.e., 4.95. Similar trend had been found in their respective SD's also, i.e., 5.52, 4.26 and 4.95. Thus control group showed highest anxiety while least anxiety was exhibited by the regular exercise group. The same differences in the means and SDs were found on the parameter of global psychological distress, i.e., 21.50 for control group, 18.80 for motivated performance group and 15.65 for the regular exercise group.

Table 2 exhibited the F-ratio along with their level of significance.

Measures	ANOVA (F-value)
Activity	1.287
Tempo	1.705
Vigor	0.416
Pulse Rate	0.788
Diastolic Blood Pressure (D)	1.634
Systolic Blood Pressure (S)	1.636
Skin Temp (C)	1.785
Body Temp.	0.188
Body Mass Index	0.718
General Health	0.313
Anxiety	4.66**
Depression	0.937
Global Psychological Distress	1.787

Table 3 Mean, Anxiety Score and t-value for Group Comparisons

S. No.	Nature of Physical Activitys	Comparison amongst groups		t-value (df=38)	
1	Motivated Group Performance	6.6	4.26	I vs. II	1.22
2	Regular Exercise Group	4.95	3.65	II vs. III	3.00**
3	Control Group	9.3	5.53	I vs. III	1.81

Table 3 shows the means and t-values for group comparisons (G-I vs. G-II, G-II vs. G-III and G-I vs. G-III) on the dimension of anxiety. The highest anxiety had been found in Control Group while Regular Exercise Group showed the lowest anxiety . The rationale behind this was that the controlgroup did not involve in any kind of physical activity which made them tensed and stress prone. On the other hand, the regular exercisers were doing physical exercise regularly to maintain their appropriate physical make up and vent off their anxiety. Donker (2000), Sharkley & Williams (2000) reported that regular exercise leads to better psychological well being. Even a light daily activity such as walking has been found to reduce hypertension (Nieman, 1998; Hyashi, 1999) reported that moderate exercise provides a short term boost, reducing the risk of infection over the long term. On the other hand, the motivated group had higher anxiety than regular exercisers because they had targets to meet, leading to sports anxiety as to achieve higher and higher . Moreover, the empirical studies reporting relationship between exercise and p sychological health also partly support the present findings. Kremer & Dudgeon (1998) reported that even short bursts of 5 minutes of aerobic exercise stimulate anti-anxiety effects. Similarly, exercise helped individuals to manage stress more effectively. Therefore, exercise had been reported as a preventive intervention in managing stress and reducing anxiety (Pollock & Gaesser, 1998). Butcher (1998) also found that health/fitness exercises promote the psychological benefits in addition to the physiological assets.

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