

Mixed Recreational Team Games Can Improve the Psychological Health in University Youth Post-COVID-19

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Abstract The study's goal was to determine how small-sided mixed recreational team sports can have an effect on exercise motivation, sleep, depression, overall well-being, self-esteem, and eating disorders in young male students. There were 26 male students in total, of whom 16 were placed in the experimental group and 9 were placed in the control group. Three times each week for 12 weeks, mixed recreational team games were provided to the experimental group. Small-sided basketball, handball, and football were among the mixed-gender activities. 30 minutes were allotted for the training. Using common questionnaires, all psychological factors were examined. Group differences were examined at the baseline and post-intervention levels using an Independent T-test. Analysis of data shows significant differences in the scores of depression in the experimental group compared to the control group. However, significant differences were not seen in the scores of self-esteem and motivation to exercise. We have observed a significant change in the eating disorder global score. Quality of sleep and improvement in general well-being were observed. Mixed recreational games were effective in reducing depression scores post-12 weeks of intervention. There is no improvement in the self-esteem of students which is not an encouraging sign in the post-COVID-19 scenario, especially among the young population. Quality of sleep and general well-being were

improved.

Keywords Recreation Games, Depression, COVID-19

1. Introduction

Staying active physically is unarguably important for general well-being and psychological health. Recreational games and sports can be effective in promoting exercise and an active lifestyle. To enjoy the benefits of exercise, these programs should be enjoyable for people of all ages. Many people prefer and like to do non-structured exercises in social settings and do not like to do exercise alone.

Almost fifty-eight percent of the adult population in the Kingdom of Saudi Arabia are likely to be physically inactive [1]. As per the survey, 90% of the population spend 2 hours daily sitting consecutively [2]. If we look at the statistic from another survey, physical activity levels were quite low in Saudi Arabia (men, 6.1%; women, 1.9%) [3]. It is evident from the literature that one cause of not exercising frequently is a lack of motivation [4]. Therefore, in view above, physical activity should become part of our lifestyle and we should find motivating and interesting

ways to exercise that not only bring health benefits but make activity enjoyable.

Recent studies have confirmed that recreational handball game is of high intensity as they can generate greater aerobic and anaerobic demands which may be the same as that of competitive situations [5]. As far as intensity in handball, it is more or less the same as that of recreational soccer [6]. Recreational soccer has shown a positive impact on the fitness and health of persons [7-9]. Team games are very encouraging and they induce long-lasting changes in the regular lifestyles of an individual. Team games appear to be more interesting as they can motivate more and more people from diverse populations [10].

There is a persistent amount of evidence that playing team games is linked to increased social and psychological health. The results suggest that team games may be more effective than solo games in promotion of health and assuring participation and continuance of exercise. However, due to innately competitive nature of games, care must be taken when using team games for the purpose of health [11].

Community sports are advised to improve physical health of teenagers and kids in light of issues like the obesity. It also improves both social and psychological health of individuals. Additionally, it is advised that the conceptual model of "Health through Sport" should be tested and that the causal relationship between engaging in sport and psychological and social health of individual should be further investigated [12].

1.1. Literature Review

In this section, we surveyed the literature related to the objectives of the present study. We found the studies that were focused on recreation, recreational sports, recreational basketball, small-sided football, and small-sided handball, and their effect on psychological and physiological variables.

Findings show the benefits and significance of teaching sports to kids from low-income homes, but they also point out the need for further efforts to remove remaining obstacles and maintain long-term involvement and advantages [13].

The correlation between sports involvement and general self-esteem was mediated by physical self-esteem, according to the results, which supported a mediational hypothesis. Specific indices of physical self-esteem showed significant sex differences [14].

According to the findings of hierarchical regression studies, early adolescent team sports success for females is positively correlated with middle adolescent self-esteem. Team sports self-evaluations serve as a partial medium for this interaction. Applications of these findings to the creation of programs that aimed at boosting young girls and women's self-esteem are explored [15].

According to the current research, some activities may have a greater capacity than others to control the

relationship between perceived stress and symptoms of depression among Swiss university students. Future studies should examine whether tailored exercise regimens designed to meet individuals' unique demands are more effective at reducing stress [16].

1.2. Research Questions

1. To find out the effect of mixed small-sided recreational team games on eating disorders, sleep, and overall well-being in young males.
2. Another purpose was to study the effect of mixed small-sided team games on self-esteem, exercise motivation, and depression in a post-COVID scenario.

Earlier we studied the effect of individual team games on health parameters; we would like to see the potential of various teams if combined. It is possible that people may not like to play just one game for weeks and months, and there is a chance of developing monotony, which may result in poor adherence to these programs. If we offer different recreational games on an alternate basis, this may create more interest in the population and may improve adherence.

We are of strong belief that recreational team games like football, basketball handball can attract and motivate young people to take part in regular exercises and stay active especially in the post COVID 19 scenario in Saudi Arabia.

2. Methods

2.1. Study Population

Samples were 26 university male students chosen randomly. Exclusion criteria were used to select participants based on the study's requirements. Before participating in the study, each participant signed a written consent form after being fully informed about it. Participants who regularly participated in handball, basketball, and football games as well as regular physical activity were excluded. Obese students and those on any medication, or who had cardiovascular disease were also excluded. The King Fahd University of Petroleum and Minerals Research Committee approved this study on March 31, 2021, as part of project SB201004.

2.2. Design of Study and Intervention

The study lasted for 12 weeks. The experimental group had 16 individuals, whereas the control group had 10 persons. The experimental group's members got access to a closely monitored four-a-side game of handball, basketball, and football. All individuals underwent testing prior to the intervention phase and again after 12 weeks. To maintain regularity, we recorded attendance daily. Since all of the

participants live on the university campus, we assume that their diet, exercise, and lifestyle were nearly identical. Experimental group members were required to play four-a-side supervised recreational handball, basketball, and football. Each session lasted 30 minutes and occurred three times per week. The different game was offered every other day. We provided participants with four-a-side recreational handball on the third day of each week, four-a-side recreational basketball on the second day, and four-a-side recreational football on the first day of each week. There were four players on each of the four teams. Games of handball and football were played on a 40x30-meter artificial court. The court size for basketball was a full court (28x15m). The sessions were uninterrupted. We stored enough balls to reduce game-time breaks. Since these were recreational games, fun, and enjoyment were given more attention than learning or developing skills. As a result, no coaching directives were given. The level of activity was continually monitored by measuring heart rate.

2.3. Measurement Tools

2.3.1. Depression

To examine depression, we used the PHQ-9 questionnaire [17]. Internal consistency ($\alpha = 0.84$) of PHQ-9 was very high [18]. It is easy to use and participants have to record their responses on a Likert scale (0 to 3). The final score is in the range of 0 to 27. If the score is high, depression is severe. The lower the score, the less severe the depression.

2.3.2. Exercise Motivation

Exercise motivation was measured by Behavioral Regulation in Exercise Questionnaire (BREQ-2), which is a 19-item self-report questionnaire (BREQ: Multan et al; 1997) [19].

2.3.3. Self Esteem

We used Rosenberg Scale to measure Self-Esteem. The student's response was recorded on a 4-point Likert scale. Overall scores ranged from 0-30. A high score denotes high self-esteem [20].

2.3.4. Sleep

The 19-item questionnaire (Pittsburgh Sleep Quality Index) was employed to measure the sleep quality [21]. There are 7 components. The score obtained from these components was added to get a global score. A higher score means the worst is the quality of sleep. Numerous research groups have evaluated the Pittsburgh Sleep

Quality Index [21-24]. The quality of sleep was evaluated using the cut-off of a global score of 5.

2.3.5. Well Being

Participants' well-being was evaluated using the WHO Well-being questionnaire. The WHO-5 questionnaire consists of 5 statements. The raw score ranges from 0-25. Then multiply the raw score by the number 4, which gives the final well-being score of an individual. The final score ranges from 0-100, 0 being worst and 100 representing best well-being [25].

2.3.6. Eating Disorder

"The Eating Disorder Examination Questionnaire (EDE-Q) [26] is a self-report instrument to assess the attitudinal and behavioral aspects of eating disorders over 28 days. The questionnaire is composed of 4 subscales: 1. Dietary Restraint, 2. Shape Concern, 3. Weight Concern, 4. Eating Concern. According to the appropriateness of the question, responses are given on a Likert scale from 0 (not at all) to 6 (markedly) or 0 (no days over the last 28) to 6 (every day over the previous 28 days). Other alternatives for replies show the number of days during the last 28 days that the participant has engaged in this activity for questions with response ratings ranging from no days to every day. The ratings for pertinent items are put together and divided by the total number of items that make up the subscale to generate subscale scores. Therefore, subscales are continuous variables".

2.4. Statistical Analysis

The Shapiro-Wilks test was used to find out if the data were normal. The independent t-test was used to examine any group differences at the baseline level. The T-Test was used to compare the delta values (posttest and pretest) between the experimental and control groups. The association between VO2 max and body fat was examined using Pearson product-moment correlation. The P-value indicated statistical significance and was 0.05.

3. Results

The mean age of the students in the experimental group was 18.62 +/- 0.88 and 18.60 +/- 0.08 in the control group. During the study duration, there were no adverse complications reported in the intervention group. There have been no reports of people leaving the experimental group. There were no baseline differences between the experimental and control groups (Table 1).

Table 1. Comparison of Psychological Characteristics at Baseline

| Psychological Characteristics | Experimental Group (n=16) | | Control Group (n=9) | | P Score |
|-------------------------------|---------------------------|------------|---------------------|------------|---------|
| | 0 Week | 12 Week | 0 Week | 12 Week | |
| Depression | 8.25±5.37 | 6.50±3.63 | 10.33±3.53 | 11.55±4.47 | 0.310 |
| Sleep | 7.68±3.04 | 5.87±1.92 | 7.11±3.14 | 7.88±2.26 | 0.658 |
| Self Esteem | 19.25±4.38 | 20.93±4.83 | 20.33±6.24 | 19.77±6.74 | 0.616 |
| Well Being | 13.06±4.07 | 15.62±4.97 | 15.44±4.18 | 15.22±4.68 | 0.178 |
| Restraint Subscale | 1.10±1.33 | 1.37±1.24 | 1.15±0.79 | 1.08±1.13 | 0.911 |
| Eating Concern Sub Scale | 1.08±1.04 | 1.10±1.06 | 0.60±0.64 | 0.92±0.92 | 0.218 |
| Shaping Concern Subscale | 1.89±1.47 | 2.00±1.32 | 1.90±1.39 | 1.78±1.20 | 0.994 |
| Weight Concern Subscale | 1.92±1.35 | 1.62±1.29 | 1.68±1.27 | 1.39±1.14 | 0.673 |
| EDE-Q Global Score | 1.50±1.12 | 1.52±1.04 | 1.33±0.81 | 1.29±0.92 | 0.701 |
| Amotivation | 0.59±0.66 | 0.45±0.45 | 0.13±0.25 | 0.37±0.43 | 0.062 |
| External Regulation | 0.75±0.93 | 0.70±0.80 | 0.30±0.48 | 0.55±0.71 | 0.197 |
| Introjected Regulation | 1.52±0.82 | 1.77±1.14 | 2.14±1.20 | 1.80±1.14 | 0.136 |
| Identified Regulation | 2.06±0.60 | 2.34±0.85 | 2.30±0.96 | 2.34±1.00 | 0.446 |
| Intrinsic Regulation | 1.93±0.78 | 2.08±0.90 | 2.53±0.54 | 2.08±0.88 | 0.057 |
| General Motivation Score | 1.37±0.40 | 1.47±0.59 | 1.48±0.40 | 1.42±0.57 | 0.512 |

Data, Means ± SD, *significant at .05 level

3.1. Depression

Data analysis showed a reduction in depression after 12 weeks of mixed recreational games between the two groups ($t_{23} = -2.197$, $P = 0.038$), with mean depression ratings in the experimental and control groups of 6.503.63 and 11.554.47, respectively (Table 2, Fig. 1).

3.2. Self Esteem

After data analysis, there we did not see any evidence of a difference in self-esteem between the experimental and control groups, with mean self-esteem scores of 20.934.83 and 19.776.74 respectively (Fig. 2, Table 2).

3.3. Sleep and Well Being

We found a significant change in the quality of sleep compared to the control group post-intervention ($t_{23} = -2.520$, $P = 0.019$), with mean sleep scores (of 5.87±1.92 and 7.88±2.26) in experimental and control groups respectively. The general well-being of participants also improved significantly ($t_{23} = 2.341$, $P = 0.028$), with a mean well-being score (15.62±4.97 and 15.22±4.68) in the experimental and control groups (Table 2, Fig.3, Fig.4).

Table 2. Comparison of Psychological Characteristic Post Intervention Mean Difference (Posttest and Pretest)

| Psychological Variable | Experimental Group (n=16) | Control Group (n=9) | P Score |
|--------------------------|---------------------------|---------------------|---------|
| Depression | -1.75±2.97 | 1.22±3.70 | 0.038* |
| Sleep | 1.81±2.61 | 0.77±2.16 | 0.019* |
| Self Esteem | 1.68±4.26 | -0.55±5.05 | 0.250 |
| Well Being | 2.56±3.01 | -0.22±2.53 | 0.028* |
| Restraint | 0.27±0.97 | -0.57±1.08 | 0.056 |
| Eating Concern | 0.01±0.78 | 0.02±0.73 | 0.976 |
| Weight Concern | -0.30±0.95 | -0.71±0.98 | 0.318 |
| EDE-Q Global Score | 0.02±0.47 | -0.44±0.59 | 0.043* |
| Amotivation | -0.14±0.54 | 0.08±0.37 | 0.288 |
| External Regulation | -0.04±0.72 | -0.02±0.23 | 0.940 |
| Introjected Regulation | 0.25±1.25 | -0.29±0.97 | 0.271 |
| Identified Regulation | 0.28±0.67 | 0.02±0.65 | 0.373 |
| Intrinsic Regulation | 0.15±0.73 | -0.44±0.65 | 0.055 |
| General Motivation Score | 0.09±0.50 | -0.13±0.32 | 0.230 |

Data, Means ± SD, *significant at .05

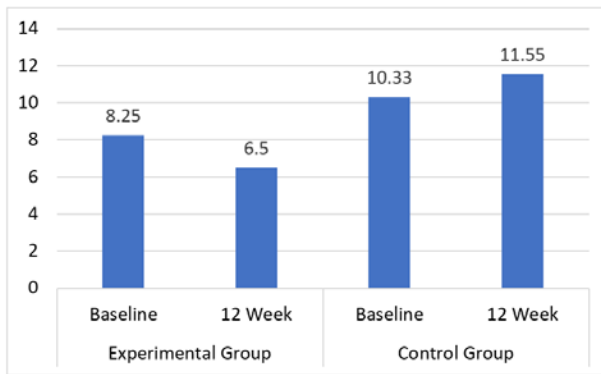


Figure 1. Depression Scores Post Intervention

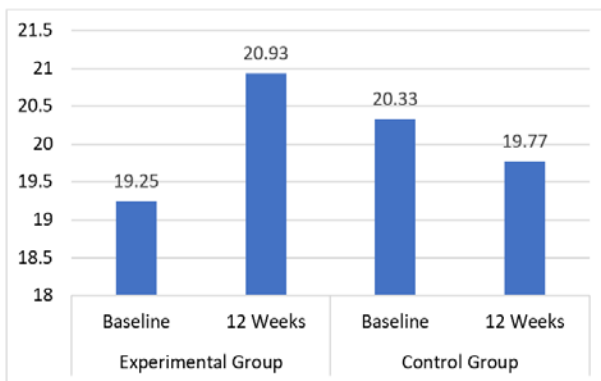


Figure 2. Self-Esteem Scores Post Intervention

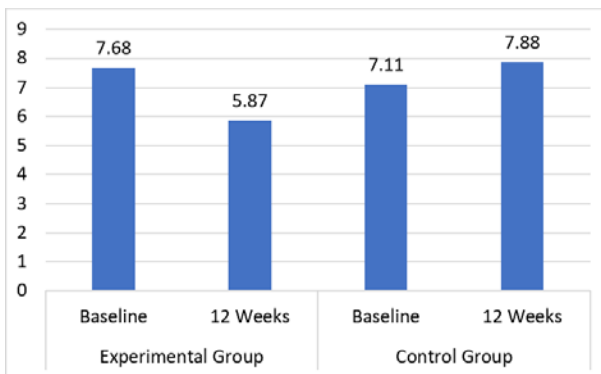


Figure 3. Sleep Quality Scores Post Intervention

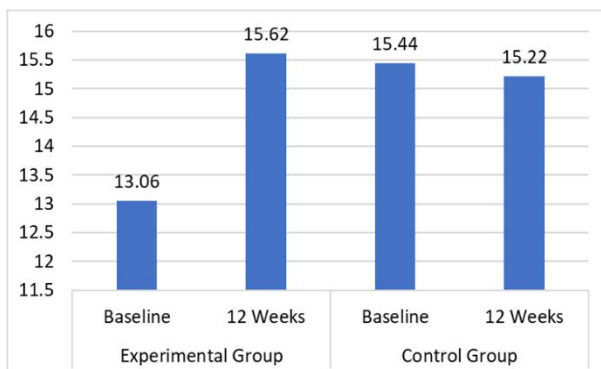


Figure 4. General Well-Being Scores Post Intervention

3.4. Eating Disorder

We have observed a significant change in EDE-Q global Score ($t_{23} = 2.147$, $P = 0.043$). Whereas, a significant difference was not seen in any of the EDE-Q sub-scales. Restraint subscale ($t_{23} = 2.014$, $P = 0.056$), eating concern sub scale ($t_{23} = -0.030$, $P = 0.976$); shaping concern sub scale ($t_{23} = 1.818$, $P = 0.082$) and weight concern ($t_{23} = 1.020$, $P = 0.318$).

3.5. Exercise Motivation

Analysis of data did not reveal any significant effect on motivation to exercise. The significant difference was not seen in any of its sub-scales. Amotivation ($t_{23} = -1.087$, $P = 0.288$), where mean amotivation was 0.45 ± 0.45 and 0.37 ± 0.43 in the experimental and control groups. External regulation sub-scale ($t_{23} = -0.077$, $P = 0.940$), where mean external regulation was 0.70 ± 0.80 and 0.55 ± 0.71 in the experimental and control groups respectively. Introjected regulation ($t_{23} = 1.128$, $P = 0.271$), with mean introjected regulation scores of 1.77 ± 1.14 and 1.80 ± 1.14 in the experimental and control groups. Identified regulation ($t_{23} = 0.909$, $P = 0.373$), with mean identified regulation score of 2.34 ± 0.85 and 2.34 ± 1.00 in experimental and control groups respectively. Intrinsic regulation ($t_{23} = 2.021$, $P = 0.055$), with mean intrinsic regulation score of 2.08 ± 0.90 and 2.08 ± 0.88 in the experimental and control groups respectively. General motivation score ($t_{23} = 1.234$, $P = 0.230$).

4. Discussion

There was a mixed outcome from the findings of this study. We have seen improvement in overall scores of depression, and sleep, self-esteem and general well-being in the participants after playing 12 weeks of recreational games. There is not much change in sub-scales of eating disorders except that of the EDE-Q Global score. This study failed to see any improvement in motivation to exercise. Students involve in this study are from engineering universities where there is a lot of academic pressure and commitments, despite playing recreational games for 2 days, the study failed to motivate students to exercise. Results from this study should be interpreted keeping this in mind. One of the positive outcomes of this study is the overall attendance of the participants which is 92.69%. This shows the interest of students in physical activities post-COVID-19. Attendance has increased compared to a similar study done previously [27].

Depression symptoms were reduced with post-intervention as evidenced by the overall depression scores. In the past many studies have studied the effect of exercise on depression in the clinical population and reported a reduction in the severity of depression [28, 29], but there are not many studies that examined the effects of small-sided recreational games on depression. Recently a

study on small-sided handball games has also depicted similar results where depression was reduced after 12 weeks of recreational handball [27]. Another study also reported decreased depression symptoms [30]. In a study on sedentary employees with inactive lifestyles, the risk of depression was reduced after 10 weeks of supervised exercise [31]. Another study done on university employees at the workplace found reduced symptoms of depression after 12 weeks of a non-supervised exercise program [32].

There was no improvement in the self-esteem of male students after 12 weeks of mixed recreational games, which was not a positive outcome especially post-COVID-19. Previous studies on self-esteem did not support our findings [33, 34]. All these studies have shown improvement in self-esteem as a result of sport participation. In another study, self-esteem of the participant improved after 10 weeks of the recreational program [35]. Another study demonstrated a positive effect of recreational physical activities on self-esteem and problem-solving skills among university male students [36]. High self-esteem was seen in people who are psychologically healthy [37] whereas low self-esteem was seen in psychologically depressed people [38].

The surprisingly present study did not show any improvement in eating disorders. There was a positive change only in restraint subscale. However, the overall EDE -Q score has improved significantly after 12 weeks of mixed reaction games training. These findings differ from earlier studies done on recreational handball where improvement was seen in eating disorder characteristics [27]. Our findings differ from the popular belief that sports participation motivates people to indulge in regular exercise. In the present study, we did not see any significant change in exercise motivation post-intervention. Our findings are contrary to a similar study done on recreational handball where positive change was seen in amotivation, external regulation, and introjected regulation [27]. A previous study suggests that sports participation is a more desirable activity for motivation [39]. The only positive change in the current study was some improvement in intrinsic motivation. A study on recreation has also shown some improvement in intrinsic motivation in university students [27]. It was suggested that undergraduate students were motivated to do exercises for improvement in competence [34].

Sleep quality was improved after 12 weeks of mixed recreational games training, this is another interesting outcome especially post-COVID-19. Deprivation in sleep can alter mood [40]. Tomar et al, in their study on recreational handball, found improvement in sleep post-intervention [27]. Sleep is an important factor for both the psychological and physical health of a person. Any reduction of deterioration in sleep quality can affect mood, motor, and other cognitive functions in young athletes and also increase the risk of injuries [41, 42]. Physical activity if done systematically and regularly can

improve the quality and quantity of sleep [43]. A bidirectional relationship was seen between physical activity and sleep [44].

Playful forms of exercise are recommended when compared to competitive forms for the overall enhancement of well-being [45]. Findings from our study also indicate that recreational forms of games can enhance general well-being in young males. A similar finding was reported by a study on recreational handball [27]. The findings of our study were further supported by a study suggesting the positive effects of high-intensity aerobic training on the well-being of adolescents. In our study also, the intensity of the training is on the higher side [46].

4.1. Future Research and Implications

There are limitations in the present study and therefore results of the current study should not be generalized to a larger population. The sample size in our study was small. We recommend conducting future research with a larger sample size including both males and females. We further suggest designing a study that includes the increased duration of intervention. Our study has the potential to provide insight into how recreational games can overcome the problem of physical inactivity in students.

5. Conclusions

Mixed recreational games were effective in reducing depression scores with post-12 weeks of intervention. There was no improvement in the self-esteem of individuals which is not an encouraging sign in the post-COVID-19 scenario, especially among the young population. Quality of sleep and general well-being were improved. However, no significant change was seen in eating disorders. Exercise motivation was not significantly improved after the intervention. However, there was some improvement in intrinsic motivation.

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