

## HOME BASED PHYSICAL ACTIVITY INTERVENTION PROGRAMME IN WAR-TORN COUNTRY LIKE IRAQ

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### ABSTRACT

The unsuitable conditions as the result of a decade of war had made it difficult to raise the level of physical activity among the youth in Iraq. Lack of awareness, as well as misconceptions about diets and the concept of physical activity among young people and the society in general especially pertaining women involvement in sports had made this matter worsen. Hence, designing home-based intervention program to enhance the physical activity level among the sedentary undergraduate female students in Iraq is crucial. The home based intervention program consists of simple exercises to be carried out at home and some nutrition information on balance diet. Forty-four sedentary undergraduate female students aged 18-22 years old were selected as subjects in this study. They were randomly selected from Northern Region of Iraq. The subjects completed a 12-weeks home based intervention program that combining simple exercises and diet information. Their daily physical activity level was measured using a pedometer. The results showed that there were a significant difference between the steps counts from pre-test to post-test1 (6-weeks) and pre-test to post-test2 (12-weeks) ( $p < 0.001$ ) in the experimental group. The mean steps increased by 6825.73 steps from pre-test to post-test1, and 9007.71 steps from pre-test to post-test2. Additionally, the results of these two groups were different in test (time) pre, post1 and post2 ( $F(2, 84) = 713.00, P < 0.05, \eta^2 = .944$ ). Based on these results, it was concluded the 12-weeks home based intervention program was effective in enhancing physical activity level among sedentary undergraduate female students in Iraq.

*Keywords: Home based intervention program, Physical activity, Undergraduate, Female.*

### INTRODUCTION

Physical inactivity has been identified as one of the important public health concerns for the youth [1]. Al-Tamimi [2], mentioned that decreased level of physical activity in life is among the most important causes of increase in the percentage of global deaths from non-infectious diseases which are estimated at 60%. Low physical activity cause 310,000 to 580,000 deaths per year and is the main contributor to disabilities resulting from diabetes, osteoporosis, obesity, and stroke [3]. The rate of physical activity begins to decline noticeably in adolescence [4], [5] and continues throughout adulthood [5]-[6]. This trend of declining in physical activity has continued among college students especially in recent years, wherein up to 50% of college students are found to be not physically active at the recommended levels [7]-[8]. In tracking physical activity participation in early college years, Racette, Deusinger, Strube, Highstein, and Deusinger [9] found that 30% of students did not report any exercise during their freshman year. Furthermore, Sengupta, Chaudhuri, and Bhattacharya

[10] conducted obesity screening of undergraduate female students and found that almost one of four female students (24 out of 100 participants) was overweight/ obese which was associated with poor to moderate physical activity and higher energy expenditure. This phenomenon has raised a serious concern among the educators because it is associated with the incidence of diseases [11]-[12].

Mirkin [13] indicated that Iraq has about 50% of the population under the age of 19. However, poor security conditions and the instability have made maintenance of health and active life a difficult task to achieve". Despite a significant number of evidence regarding the benefits of being physically active, unfortunately, insecure society forces students to stay at home most of the time which contributes to students' poor participation in sports activities in the university. As a result, parents do not usually encourage their daughters to engage in sports teams and social clubs due to the security situation which could endanger the lives of their children. The other key factors are lack of adequate academic- attributed encouragement and heavy load of academic work. In addition, United Nations

Assistance Mission for Iraq (UNAMI) has repeatedly reported that in society's perception, women's involvement in sport is an indecent phenomenon [14]. This negative society image of women involved in sport has further hindered women participation in sport in Iraq. Furthermore, the World Health Organization (WHO) indicated in its report that the percentages of physically inactive and overweight females in Iraq are 51.3% and 65.1%, respectively [15].

Walking programs are considered safe and effective ways to increase physical activity, decrease body weight, body mass index, and percentage of body fat and resting diastolic blood pressure in previously sedentary adults [16]-[17]-[18]. Physical activity is important in everyday life and low levels of physical activity are independent risk factors for chronic diseases and premature mortality among adults [19]. According to Adams [14], regular physical activity is associated with prevention of morbidity because low level of physical activity increases the risk of cardiovascular, stroke, and coronary events. Sugiyama, Healy, Dunstan, Salmon, and Owen [20] demonstrated that engaging in 150 minutes (2 ½ hours) of moderate intensity physical activity in a weekly basis consistently reduces the risk of many chronic diseases and other adverse health outcomes such as heart disease, coronary heart disease, stroke, some cancers, type 2 diabetes, osteoporosis, and depression and even death". Therefore, introducing walking as an important and easily accessible fitness activity to individuals' daily activities seems to be appropriate and helpful in improving the overall physical activity level and health of an individual especially if it has done at home. The walking activity is easy, fun and will be more acceptable than jogging or other hard activities. Therefore, it will be a suitable way for sedentary people who want to increase their physical activity level. Indeed, the protective effects of physical activity on cardiovascular disease start at moderate levels of this regular activity [21]-[22].

There are many types of intervention that can help to improve individuals' health but a combination of physical activity and dietary intervention programs were found to be more effective to maintain regular physical activity and diet [23]. Good intervention program consisting of a combination of physical activity and dietary awareness can enhance the level of physical activity during daily life behavior [23]-[24]-[25]-[26]-[27]-[28]-[29]. These studies differed according to whether the implementation of the intervention program were at home or outside. However, they were similar to each other in that they were conducted in countries that were safe and secure focusing on patients as the participants of the study. Thus, the current study was conducted to address the gap in the literature on the effect of home based

intervention with the combination of physical activity and dietary awareness on sedentary undergraduate female students in Iraq.

## **METHODS**

### **Ethics Statement**

This study was approved by the ethical approval committees in University Putra Malaysia-Malaysia, and the Scientific Committee in the College of Education in Soran University - Kurdistan Regional - Iraq, and all participants provided their written informed consent prior to the intervention.

### **Participants**

One hundred and six freshman female students in the academic year 2014-2015 agreed to participate in this study. They were demographically screened and their physical activity level and health were assessed based on inclusion and exclusion criteria (i.e., being healthy, not associated with any medication or treatment, not pregnant, willing and able to adhere to the intervention program). At the end of the screening, 44 individuals were randomly chosen and were equally divided into 2 groups: an experimental group and a control group.

### **Assessments Pre, Post1, Post2-Intervention**

Physical activity level was measured by the Yamax Digi-Walker® SW-200 pedometer (Yamax Corp. Tokyo, Japan). The SW-200 is a small (2.0 in. x 1.5 in. x 0.75 in.), lightweight (0.75 oz.) pedometer worn on a waistband or belt to measure the daily level of physical activity based on step count. The number of steps was recorded for 3 days a week and the average was calculated for pre-test (week 1), post-test1 (week 6), and post-test2 (week 12) respectively.

## **THE INTERVENTION PROGRAM**

Duration of the treatment for this study was 12 weeks. Five weekly sessions of exercise and 2 weekly sessions of food awareness were conducted. The students allocated to the control group maintained their regular and daily activities during the 12 normal week intervention. At the end of week- 6 and week- 12 intervention, the same test was offered to the experimental and control groups again.

### **Exercise Intervention**

The students were required to practice some of the simple and easy exercises at home. This exercises involved activities like using home

equipment (chair, table, stairs (to move. Besides movement such as walking and walking at a place adapted from well-known physical activity guidelines [16] was also included. The students practised the schedule as follows: each session was 150 minute from week 1 to 4 (Brisk walk exercises, muscle strengthening, 5 times per week), which increased to 225 minutes from week 5 to 8 (brisk walk exercises, muscle strengthening, 5 times per week) which increasing in time practising for each day from 30 minutes to 45 minutes. Finally the progression from week 9 to 12 was 250 minutes (brisk walk exercises, muscle strengthening, 5 times per week) in which practice time for each day gradually increased from 45 minutes to 50 minutes and the distance for physical activity program was extended from 3 miles to 4 miles.

**Nutritional Intervention**

Two- time- per - week sessions were included in the intervention, emphasis was given to increase the knowledge of the importance and the effect of good diet on life. Students had nutritional lessons during their free time through the 12-week duration of the experiment. Lesson included a variety of topics such as food pyramid, healthy food and a balanced diet, 5 most important points that they must know in dietary, weight control, and food should increase and food should reduce. This information was adapted from the dietary guidelines for Americans, 2010 [30].

**RESULTS**

No significant differences were found in pre-test between the experimental group, M= 3905.25, SD =483.73 and the control group, M =4136.37, SD =631.54. The results of repeated measures ANOVA on PA showed that the interaction between group and test was statistically significant (F(2, 84) =731.01, P<0.05, η<sup>2</sup>=0.944) therefore to test the related hypothesis, post hoc test (Bonferroni) was applied to compare the mean scores. After the 12 week home-based intervention, significant differences were found between the groups at post-test1 and post-test2 (Table II).

In order to show the efficacy of home based intervention, pre, post1 and post-test2 in both the experimental and control groups were compared. The result of post hoc test (Bonferroni) revealed that the difference between pre-test and post-test1, post1and post-test2 in physical activity score among experimental group was significant. The mean score of physical activity in experimental group increased to 9007.71 steps. While the result for the control group did not show a significant result. The mean score in control group increased to 386.31 steps and there was not a significant difference in physical activity between post-test1 and post-test2 in control

group as shown in Table III.

Table II: Physical activity difference between experimental and control groups in pre-test, post-test1 and post-test2

Time	(I) Group	(J) Group	Mean Difference (I-J)	SE	P value	η <sup>2</sup>
Pre-test	EXP	CON	-231.12	169.60	0.180	0.04
Post-test1	EXP	CON	6832.33*	206.25	0.001	0.96
Post-test2	EXP	CON	9162.91*	180.15	0.001	0.98

Based on estimated marginal means

\* The mean difference is significant at 0 .05 level.

Adjustment for multiple comparisons: Bonferroni

Table III: The difference of physical activity scores between tests in experimental and control groups

Group	(I) time	(J) time	Mean Difference (I-J)	SE	P value	η <sup>2</sup>
EXP	Pre	Post1	-6825.73*	156.53	0.001	0.99
	Pre	Post2	-9007.71*	183.04	0.001	
	Post1	Post2	-2181.96*	206.58	0.001	
CON	Pre	Post1	237.73	156.53	0.409	0.12
	Pre	Post2	386.32	183.04	0.122	
	Post1	Post2	148.59	206.58	1.000	

Based on estimated marginal means

\* The mean difference is significant at 0.05 level.

Adjustment for multiple comparisons: Bonferroni

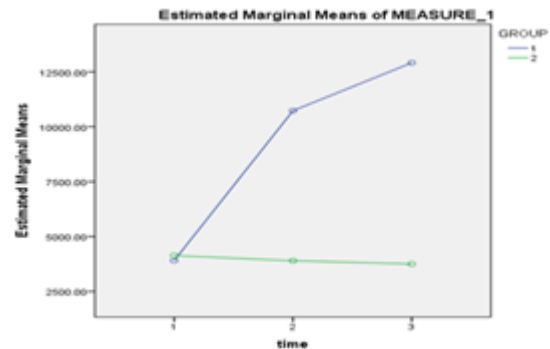


Figure I: Plot of physical activity score in both experimental (1) and control (2) groups

As it can be seen in (Figure I) for experimental group the score of physical activity increased from week 1to week 12, in post-test1 (week 6) and the post-test2 (week 12), however, for control group it did not increase in post-test1 and post-test2. This shows that home-based intervention positively affected physical activity level. In another word, for the control group deterioration in physical activity level was reported during post-test1 (week 6) and further deterioration was reported in the end of post-test2 (week 12). The results indicate that in reality, Iraqi women will remain inactive if they are not encouraged to exercise.

**DISCUSSION**

Several studies demonstrated that intervention program with moderate intensity of physical activity such as walking, cycling, or participating in sports and diet has significant benefits for health. For

instance, it can reduce the risk of cardiovascular diseases, diabetes, colon and breast cancer, and depression [31]-[32]-[33]-[34]. Low physical activity and dietary awareness contributes to health risks among female undergraduates in Iraq highlighting the importance of physical activity and dietary awareness indicators to find out the humans physical improvement. This study demonstrated significant differences between the experimental and control groups after 6 weeks and 12 weeks of the combined home- based physical activity and diet intervention program, post-test1 ( $p < 0.05$ ,  $\eta^2 = 0.963$ ) and post-test2 ( $p < 0.001$ ,  $\eta^2 = 0.984$ ). Many studies confirm that intervention program with the combination of physical activity and diet can make significant differences in physical activity level [25]-[35]-[36]. Likewise, the physical activity level increased for the experimental group from week1 to week 6 (6825.72 steps), from week 7 to week 12 (2181.98 steps) which is supported by previous studies [7]-[28]-[37]. Thus, increasing the level of physical activity could be regarded as an intervention effect. The results showed that moderate to vigorous physical activity increased the physical activity level for the experimental group compared with the control group.

According to Ferreira et al. [28], physically active women significantly increased their physical activity level after engaging in (physical activity and diet) intervention program for 12 weeks. Accordingly Burke et al. [25], confirmed that physical activity level increased following changes in daily life behavior adopting a low-cost, accessible, home- based physical activity and nutrition intervention program. The results showed that both groups differed significantly in physical activity level. The same results somehow repeated in this study which show the effectiveness of the 12 -week dietary awareness home- based intervention program to increase the physical activity level for sedentary undergraduate female students. The increase in physical activity level suggests that home- based physical activity and diet interventions program and their strategy is an affective way and appropriate means to improve individual's physical activity and eliminate inactive lifestyle.

On another hand, Mostert and Kesselring [38] reported that the physical activity level did not improve during a short-term exercise training intervention program". The intervention in their study consisted of 30-minute bicycle exercise sessions with individualized intensity 5 days per week over 3–4 weeks. They attributed these contradictory findings to two reasons: First, the intervention strategies such as the compliance to the training program were quite low, which affected the

result of the research. While, in the current study the subjects were very energetic, however, they could not exercise due to security issues in Iraq. Second, the level of physical activity was recorded lower than it was expected, which was due to the short period of training that lasted four weeks compared with 12 weeks in the current study. Panel of researchers emphasized that when intervention programs were conducted for longer duration it would show positive result regarding physical activity despite the difference in the type of the intervention program [39]-[40]-[41]-[42]. This study also indicated that there were significant differences in physical activity between pre-test, post-test1, and post-test 2 after 12 weeks home- based intervention for the experimental group ( $p < 0.001$ ) as well as significant differences in physical activity between experimental and control groups ( $p < 0.001$ ).

## CONCLUSION

In summary, this study suggested that 12-week home-based physical activity and dietary awareness intervention program was effective in enhancing and improving physical activity level among sedentary undergraduate female students in Iraq. The improvement of the level of physical activity in the experimental group at post-test2 reveals the importance of home- based intervention program and it is a positive step toward a change in the sedentary undergraduate female students' life.

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