



Research article

Effect of Karate Exercises on Irregular Menstrual Cycles in College Going Girls- A Pre and Post Experimental Study

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ABSTRACT

Studies which are done worldwide, have stated that 74% of adult women suffer from irregular menstrual cycles and other associated symptoms. They have also found that there is association between quality of life and irregular menstrual cycles and distress related to menstrual irregularities. This study was a pre and post experimental study, where 45 college going girls were screened for irregular menstrual cycles, followed by that, demographic details were taken and pre intervention BMI was calculated and menstrual distress questionnaire scores were analyzed. The Karate exercises included, 15 minutes of Running, 15 minutes of 100 punches, 100 kicks for 15 minutes, 15 minutes of Karate techniques and 10 minutes of Katas and 5 minutes of cool down exercises and breathing exercises. The results of pre and post interventions showed that the Karate exercises were effective on irregular menstrual cycles along with decrease in BMI levels and menstrual distress questionnaire scores including domains. Based on the results, the study can be concluded that, the Karate exercises are effective on irregular menstrual cycles along with reduction in BMI levels and menstrual distress questionnaire scores. In addition it showed the improvement in pain, negative thoughts, concentration related to menstrual irregularities. The study found that the karate exercises are mostly effective on menstrual distress than BMI levels.

Keywords: Irregular menstrual cycles, Karate, BMI, Menstrual distress questionnaire.

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INTRODUCTION

Menarche is the stage, which is marker of puberty and it is considered as important stage of human life. The menstruation is normal physiological process that is a periodic and cyclic shedding of pro-gestational endometrium along with loss of blood. The duration of flow normally occurs from 2 to 7 days [1]. It is considered as important sign which shows the normal development. The menstruation is normal physiological process that is a periodic and cyclic shedding of pro-gestational endometrium along with loss of blood. It is considered as important sign which shows the normal development [2]. Menstruation is managed by two ovarian hormones oestrogen and progesterone. Estrogen affects different tissues on various levels. There by it begins or mediates a loads of biological processes [3]. It is natural that in all the time of the reproductive stage, the women experience, 30 to 50ml blood loss with or without any symptoms. A women undergo 400 menstrual cycles throughout her reproductive age. In India 75% of women undergo menstrual abnormalities. Namely, irregular menstrual cycles, delayed menstrual cycles, dysmenorrhea, and severe menstrual

blood flow. The menstrual cycle is affected by the environmental factors and life style negligence. The increasing rate of unhealthy life style is because of consumption of Junk food, fast food, carbonated drinks and less physical activity, this lifestyle is the major cause of menstrual irregularities [4]. According to statistics 44.1% of women experienced fear on attaining menarche, while 26.1% feel anxious during menstrual cycles 56.8% of women felt that menstruation gives a large amount of physical and psychological weight on woman's life [5].

High BMI (obesity) in children has been linked to the risk of early onset of puberty and menarche this has been identified as the important factor in the decreases in the onset of puberty and eventually menarche in industrialized nations and other regions with improving nutritional and socioeconomic status. In adults High BMI and sedentary behaviour's will affect the level and balance between endogenous hormones which are important for proper menstrual function which are resulting in irregular menstruation. BMI is significantly co-related with prolong menstrual cycle's menses. Girls

with High BMI experience significantly longer menstrual cycles and menses compared to their normal weight counterparts [6]. Women with increased or decreased BMI are prone to have a greater frequency of menstrual disturbances. Because women with high or low BMI may be less physically active. The invention of a Menstrual Distress Questionnaire (MDQ) also known as MOOS, which was to use as a high quality standard method for investigate the menstrual cycle abnormalities, To add the information on prevalence of the symptoms and its risk on this questionnaire in a sample of normal married adult women, to know the possible correlation between the risk of symptoms as evaluated in the questionnaire, the evaluation of the effect of age and reproductive history on symptom risks, the assessment of the effects of memory and the menstrual phase, a woman is in, when she is answering the questionnaire on re-occurrence of the symptoms.

Information about the effects of memory and menstrual cycle stage to report the menstrual symptoms are essential for proper assessment of a questionnaire method to gather a data in terms of abnormal menstruation [7]. Karate is one of the physical exercises which involve basic techniques, katas and sparring. The basic exercises contains punching kicking, blocking and striking practiced in stationary position or with minimal body movement. The growing research pointed out regular physical activities like karate, Taekwondo or any other martial art has effect on biological reactions on musculoskeletal systems, and neurological systems. The basic techniques like punches, kicking, and blocking are used to train participants for their strength and flexibility. Katas is characterized by sequences and forms of techniques which are gathered together and used for training against imaginary antagonists.⁸ Studies which are done worldwide, have stated that 74% of adult women suffer from irregular menstrual cycles and other associated symptoms. They have also found that there is association between quality of life and irregular menstrual cycles.

Various studies have shown the association between thyroid dysfunction, abnormal BMI and irregular menstrual cycles which cause miscarriage and infertility in young women. Many studies have shown the medical management for irregular menstrual cycles are effective. But they have also stated that the adverse effect of synthetic progesterone treatment are various which cause metabolic, haematological and endocrine dysfunctions. Many studies have found the association between BMI levels and menstrual irregularities But, There are very less studies which have shown the effect of Karate exercises on irregular menstrual cycles in college going girls The present study aims to see the effect of Karate exercises as physical activity on irregular menstrual cycles in terms of BMI and Menstrual Distress Questionnaire in college going girls of Belagavi city.

METHODOLOGY

Source of data was taken from Colleges of Belagavi city the

study was conducted for 12 months from February 2019 to March 2020. The study was a pre and post experimental study. A 44 College going girls with irregular menstrual cycles between the age group of 18 to 25 years were included in the study ($n = \frac{sd^2(z_{\beta} + z_{\alpha/2})^2}{d^2} = 44$) Menstrual distress questionnaire and BMI was used as an outcome measure Inclusion Criteria for study was College girls between age group of 18 to 25 years with irregular menstrual cycles and Exclusion criteria was College going girls having fresh injuries, fracture and trauma and undergoing medical management for menstrual irregularities.

The subjects were asked to rate each menstrual distress questionnaire items on a scale of 1-6 where 1 is no experience of symptoms, 2 is barely noticeable, 3 is present but mild, 4 is moderately present, 5 is strongly present and 6 is acute or partially disabling, the score will be calculated by adding all the symptoms related scores and the mean score will be obtained [8]. BMI is defined as, investigation of the nutritional status in human being. It is stated as weight of the person in kilograms divided by the square of a height of a person in meters (kg/m^2). For example, an adult who weighs 80 kg and whose height is 1.65 m will have a BMI of 29.41. The BMI is divided in to 6 categories the first one is underweight that is below 18.5, normal BMI ranges from 18.5 to 24.9, followed by that pre obesity ranges from 25.0 to 29.9, class 1 obesity ranges from 30.0 to 34.9, class 2 obesity ranges from 35.0 to 39.9, and class 3 obesity is above 40.0 The BMI ranges are dependent on the impact of excessive body fat, which causes disease and death. And these ranges are also well related to adiposity.

Institutional Ethical Committee will provide the ethical clearance for study to conduct. All participants will be screened for inclusion and exclusion criteria before their recruitment in the study. The procedure will be explained to the subjects in their vernacular language and a written Informed consent will be obtained from the study participants. Demographic characteristics will be noted. All subjects will be screened for menstrual distress questionnaire [9], and BMI score before the intervention [10].

15 minutes- Running and warm up exercises which included The warm up exercises included, neck movements, shoulder movements, lumbar movements, high leg raises in standing, high leg rotations in standing 15 minutes of 100 punches The punches included upper punch, lower punch, middle punch, single punch, double punch, triple punch. It also contains blocks such as, upper block, front block, outer block and inner blocks these punches and blocks were performed in horse stance. 15 minutes- 100 kicks the kicks included, front kick, side kick face kick and turn kick these kicks were initiated in defence stance, horse stance, and cat stance. 15 minutes of Techniques, these included the combination of kicks and punches. 10 minutes of Katas. These katas are usually used to increase the endurance and muscle strength. These katas includes sequence of karate techniques. in 5

minutes of Cool down exercises and breathing exercises. The cool down exercises included stretching exercises of all upper limb and lower limb muscles and lumbar muscles in combination with deep breathing exercises.

RESULTS

18 to 25 years age group participants were included in the study, the mean age was 21.63 years with standard deviation 1.49. The mean BMI calculated in pre-test was 25.27 with standard deviation 4.25 and in post-test was 25.06 with standard deviation 4.29, so mean difference was 0.21 with standard deviation 0.60. The percentage of effect size indicates 0.83% improvement, with p-value of 0.025*. Hence there is significant statistical reliable difference between the pre and post treatment values with p-value is less than the 5% significance level ($0.025^* < 0.05$). This indicates that there was reduction in BMI levels. The mean MDQ score, pre-test was 71.13 with standard deviation 30.03 and post-test was 42.90 with standard deviation 11.61. Hence mean difference was 28.22 with standard deviation 26.01.

The percentage of effect size indicates 39.67% improvement, with p-value of 0.001*. Hence there is a significant statistical reliable difference between pre and post treatment value with p-value is less than the 5% significant level ($0.001 > 0.05$). The mean pain score pre-test was 23.02 and post-test 17.82 with mean difference 5.2 which was greater than concentration scores, followed by that mean concentration score pre-test was 18.25 and post-test 13.50 with mean difference 4.75. the mean Behavioural change score pre-test was 17.55 and post-test was 11.68 with mean difference 5.86, here behavioural changes were lesser than the concentration scores. The arousal score pre-test was 16.16 and post test score was 11.20 which was greater than negative effects scores. The mean negative effect pre-test score were 14.39 and post-test 9.07 with mean difference 5.32. The mean pre-test score for autonomic reactions were 10.55 and post-test 6.86 with mean difference 3.62 which is lesser than scores of negative effects. The mean water retention was 9.30 and post test scores were 6.07 with mean difference 3.23, which was greater than the scores of control. The mean scores of control for pre-test were 4.84 and post-test were 2.89 with mean difference of 1.94.

Table 1. Pre and Post Scores Paired sample t test for BMI

Variable	Pre Test		Post Test		Difference		% of effect	t-value	p-value
	Mean	SD	Mean	SD	Mean	SD			
BMI	25.27	4.25	25.06	4.29	0.21	0.60	0.83	2.330	0.025*

*Significant at 5% level

Table 2. Pre and Post Scores Paired sample t test for MDQ

Variable	Pre Test		Post Test		Difference		% of effect	t-value	p-value
	Mean	SD	Mean	SD	Mean	SD			
MDQ	71.13	30.03	42.90	11.61	28.22	26.01	39.67	7.201	0.001*

*Significant at 5% level

Table 3. Pre and Post Scores Paired sample t test for Domains

Variable	Pre Test		Post Test		Difference		% of effect	t-value	p-value
	Mean	SD	Mean	SD	Mean	SD			
Pain	23.02	7.21	17.82	6.67	5.20	2.38	22.59%	14.518	0.001*
Concentration	18.25	7.76	13.50	6.72	4.75	3.07	26.03%	10.276	0.001*
Behavioral change	17.55	8.44	11.68	6.37	5.86	3.77	33.39%	10.317	0.001*
AUTONIMIC	10.55	6.58	6.86	5.28	3.68	2.27	34.88%	10.759	0.001*
Water retention	9.30	6.62	6.07	5.02	3.23	2.59	34.73%	8.276	0.001*
Negative effect	14.39	7.16	9.07	5.28	5.32	4.47	36.97%	7.890	0.001*
Arousal	16.16	9.12	11.20	7.39	4.95	3.44	30.63%	9.544	0.001*
Control	4.84	3.55	2.89	2.34	1.95	1.90	40.29%	6.809	0.001*

DISCUSSION

The very important indicator of the women reproductive system and endocrine system, is her menstrual cycles or menstruation which is very important to regulate. The menstruation shows different types is characteristics in three categories such as in volume, pattern and regularity. The present study shows the association of menstrual distress with irregular menstrual cycles it shows that, there is increase in menstrual distress with increase in irregular menstrual cycles. Another Indian study showed the similar observation, where they conducted a study on menstrual cycle patterns, symptoms related to menstrual cycles in women of Amravati city, India. They concluded that, there was a higher percentage of females in Amravati city, who experienced problems during menstrual cycle. The Most of the females are suffered from oligomenorrhea and menorrhagia, due to hormonal issues. They also suggested that an exercise program should be conducted for life style problems and awareness programs should be conducted among girls with menstrual problems and their parents to minimize the infertility in young girls [11]. The most important health problems in developing countries like India is infertility. The prevalence rate ranging from 6.6% to 32.6% for life time. Infertility can affect the whole life which is also associated with dysthymia, anxiety and other psychological symptoms. A retrospective study was conducted in 1080 Iranian women, who were complaining of irregular menstrual cycles. The international physical activity questionnaire short form was used to assess the physical activity.

The life style factors were compared between those who experienced infertility. The study concluded with, obesity and infertility are increasing public health issues, more attention should be paid to life style behaviours, especially gaining weight in women who experienced irregular menstrual cycles and infertility [12]. The present study shows the relation between BMI, physical activity, irregular menstrual cycles and distress related to irregular menstrual cycles, it shows that physical activity reduced the distress related to irregular menstrual cycles and BMI. As per the study done, researcher say that many women engage in karate training, their understanding was the metabolic demands of karate training is mostly related only to men because most of the karate studies have done on male subjects, but

some studies have given Karate exercises to female subject also. In many previous studies, researchers have used male subjects and reported that heart rate (HR) responses during performing 1,000 punches and 1,000 kicks were moderate. So these researchers investigated oxygen uptake (VO₂), HR and blood lactate responses and rate of perceived exertion (RPE) during 1,000 punches and 1,000 kicks in females who got black belt in Karate. The study concluded that VO₂ Max, heart rate and blood lactate responses during 1,000 punches and 1,000 kicks are moderate. In present study we have used moderate intensity Karate exercises to see the effects on menstrual irregularities and distress related to menstrual cycle irregularities in young adults between the age group of 18 - 25, the study has shown the significant changes in post intervention on menstrual distress and BMI levels and improvement in menstrual irregularities.

The present study proves that Karate Exercises were effective on distress symptoms related to irregular menstrual cycles. In addition it shows the significant improvement in all the domains of menstrual distress questionnaire, such as pain, concentration, behavioural changes, arousal symptoms, negative effects Autonomic reactions, Water retention and control. Participants mostly marked scoring related to pain, behavioural changes, concentration compare to other symptoms. The karate exercises mainly improved the symptoms like pain (headaches, cramps, Lower back pain etc.) and concentration in academic work in students. Participants showed a positive changes in their behaviour, towards life and education. If we compare the improvement in BMI with distress symptoms, BMI did not show much difference compared to MDQ scores. The reason could be, the intervention was given for very less duration, which did not cause any improvement in BMI levels. As many studies have quoted that, to see the improvement in BMI levels, the exercise interventions should be for longer period. Another reason could be dietary intakes, the study did not concentrate on dietary changes in girls with irregular menstrual cycles. So, this study concludes that Karate exercises are effective on irregular menstrual cycles along with decrease in distress symptoms compare to improvement in BMI levels

CONCLUSION

The present study proves that Karate Exercises were effective on reducing BMI levels and distress symptoms related to irregular menstrual cycles. This study concludes that Karate exercises are effective on irregular menstrual cycles along with decrease in distress symptoms compare to BMI levels. The future study can be done using serum ferritin to see specific cause of irregular menstrual cycles and to investigate the effect of Karate exercises on irregular menstrual cycles and in terms of serum ferritin levels for longer duration and intervention follow up.

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