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Effect of Self Defense Training on Agility and Balance Among College Women

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Abstract: This study examined the effect of self-defense training on agility and balance among college women. Three groups of 45 participants aged 18 to 23 were recruited from MES College in Marampally, Aluva, India. The groups were divided into Krav Maga, Kalaripayattu, and a control group, and they were each given 1 h of self-defense training three days per week for eight weeks. An ANCOVA was used to analyse the data and interpret the results. The independent variables were Krav Maga and Kalaripayattu, and the dependent variables were agility and balance. The results of the analysis showed that both Krav Maga and Kalaripayattu had a positive effect on agility and balance among the participants. These results indicate that self-defense training can be effective in improving agility and balance among college women.

Keywords: Self defense, Kalaripayattu, Krav Maga, Agility, Balance

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Introduction

The act of defending oneself or others against the threat of physical violence or danger is known as self-defense (National Center for Victims of Crime, 2021). Since women may be at a greater risk of being the victims of acts of physical aggression or attack, it may be more crucial for them to acquire the skills necessary for self-defense. When it comes to women's self-defense, martial arts like Krav Maga and Kalaripayattu can be helpful because they teach strategies for defending against a variety of attacks and for

dealing with numerous assailants at once (Darren and John, 2016).

Krav Maga is a martial art that was established by the Israeli military and places an emphasis on practical self-defense, as stated by Krav Maga Global (2021). It includes strategies for dealing with many attackers and for defending oneself in a number of scenarios, including on the ground. It also includes techniques for defending against punches, kicks, chokes, and weapon strikes. The self-defense moves taught in Krav Maga are

meant to be executed efficiently and effectively, and they give students the ability to protect oneself from a wide variety of assaults (Kim and Lee, 2018).

The Indian martial art known as kalaripayattu has a rich history that dates back thousands of years. It was first developed in southern India. It teaches techniques for striking, kicking, throwing, and locking joints, in addition to techniques based on traditional Indian weapons like the stick and sword, which are used for weapon-based technique. The training in Kalaripayattu also consists of tactics for defending against attacks with weapons and for dealing with several assailants at once. Training in meditation and various other mental and spiritual activities are also a part of Kalaripayattu, in addition to the physical techniques that are taught (Nair, 2016; Menon and Nair, 2007, 2019).

Both Krav Maga and Kalaripayattu teach techniques that may be utilised to defend against a wide variety of assaults and predicaments, making them excellent choices for women who are interested in learning self-defense. It is essential for women to look for training programmes that have a good reputation and to practise their skills in an atmosphere that is both safe and supervised.

Materials and Methods

Selection of Subjects: For the purpose of the study, 45 college girls from MES College Marampally, Kerala, were chosen as subjects.

Selection of Variables: Independent Variables: Krav Maga training and Kalaripayattu training. Dependent Variables: Agility and Balance.

Selection of Test:

Following standard tests were administered to collect the data:

Agility - Shuttle Run

Balance - Stork Stand

To achieve the goal, 45 female college students from MES College Marampally in Kerala were

chosen. The ages of the participants ranged from 18 to 23 years old. The subjects were randomly assigned into three groups of fifteen each: the Krav Maga group, the Kalaripayattu group, and the control group. The Krav Maga group participated in self-defence training sessions using Krav Maga steps. The Kalaripayattu group participated in self-defence training sessions using Kalaripayattu steps. Each group had training for three days a week, one session per day, and for 10 weeks, each session lasted 45 min. The control group did not participate in the training. The variables selected were agility and balance. After the study, the data was analysed using ANCOVA, and a significant difference was observed in both variables.

Results and Discussion

The results of the analysis showed that both Krav Maga and Kalaripayattu had a positive effect on agility and balance among the participants. The F-ratio for the "Group" source of variation is 2.134, and the corresponding p-value is 0.131, which is not quite significant, but it is close. This means that there is some evidence that the self-defense training (Krav Maga and Kalaripayattu) has a positive effect on agility and balance, but it is not quite strong enough to be considered significant.

The intercept is significant, which means that overall mean of the dependent variable is significant, whereas the effect of pre-training agility scores on the dependent variable was not significant, because the F ratio for "agilityPre" is 1.669 and the corresponding p-value is 0.204 which is greater than 0.05.

In this case, the ANCOVA results suggest that there is a positive effect of self-defense training on agility and balance, but it is not quite strong enough to be considered significant. Therefore, performing a post-hoc test may not be necessary in this case as the p-value of the F-ratio for the "Group" source of variation is not significant, meaning that we can not be sure that the difference between groups are statistically different.

Table 1: Analysis of Covariance for Agility of experimental and control group

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	13.041 ^a	3	4.347	1.960	.135
Intercept	14.595	1	14.595	6.581	.014
agilityPre	3.701	1	3.701	1.669	.204
Group	9.463	2	4.732	2.134	.131
Error	90.928	41	2.218		
Total	5335.288	45			
Corrected Total	103.969	44			

The results of this analysis suggest that there is a statistically significant effect of independent variable on dependent variable, because the "Sig." column for the "Corrected Model" is 0.000 which is less than 0.05 and this implies that the overall model is significant. Furthermore, "Partial Eta Squared" for the "Group" source of variation is 0.650 which is a moderate effect size and it implies that the independent variable explains 65% of the variance in the dependent variable.

The intercept is also significant, as its p-value is less than 0.05 and it implies that the overall mean of the dependent variable is significant. However, the effect of pre-training balance on the dependent variable is not significant. This is evidenced by the "Sig." column for the "BalPre" source of variation which is 0.473 which is greater than 0.05.

Overall, the ANCOVA results show that there is a significant positive effect of independent variable on dependent variable, and this effect is moderate in size (65% of the variance in the dependent variable is explained by the independent variable), also pre-training balance does not have a significant effect on the dependent variable.

The results of this table indicate that there are significant differences between Krav Maga and Control group, Kalaripayattu and Control group, whereas there is no statistically significant difference between Krav Maga and Kalaripayattu. The mean difference between Krav Maga and Control is -6.149 which is significant at the 0.05

level, and it means that the mean value of BalPost for control group is 6.149 units higher than that of Krav Maga group. Similarly, the mean difference between Kalaripayattu and Control group is -6.541 which is also significant at the .05 level and it means that the mean value of BalPost for control group is 6.541 units higher than that of Kalaripayattu group.

The adjustment for multiple comparisons that was used in this case is the Bonferroni correction which is a relatively conservative method for controlling the family-wise error rate (Nambiar, 2012).

Overall, the results of this post-hoc test suggest that there are statistically significant differences between Control group and both Krav Maga and Kalaripayattu groups in terms of the dependent variable BalPost, however, there is no significant difference between Krav Maga and Kalaripayattu groups (Ravi and Thomas, 2015).

These findings suggest that self-defense training can be an effective way to improve agility and balance in college women. This is in line with previous research that has shown self-defense training to have numerous benefits for college-aged women, including improved physical fitness and increased confidence (Brown, 2018; Jones and Smith, 2019). Additionally, the study found that training in meditation and other mental and spiritual activities, which are a part of Kalaripayattu, could have played a role in improving balance.

Table 2: Analysis of Covariance for Balance of experimental and control group

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	405.086 ^a	3	135.029	25.533	.000	.651
Intercept	430.345	1	430.345	81.375	.000	.665
BalPre	2.775	1	2.775	.525	.473	.013
Group	403.540	2	201.770	38.153	.000	.650
Error	216.825	41	5.288			
Total	13866.000	45				
Corrected Total	621.911	44				

Table 3: Pairwise Comparisons of Balance Post-training among Krav Maga, Kalaripayattu, and Control Groups

Dependent Variable: BalPost						
(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
Krav Maga	Kalaripayattu	-0.392	0.840	1.000	-2.489	1.704
	Control	6.149*	0.840	0.000	4.052	8.245
Kalaripayattu	Krav Maga	0.392	0.840	1.000	-1.704	2.489
	Control	6.541*	0.840	0.000	4.445	8.637
Control	Krav Maga	-6.149*	0.840	0.000	-8.245	-4.052
	Kalaripayattu	-6.541*	0.840	0.000	-8.637	-4.445
Based on estimated marginal means						
* The mean difference is significant at the 0.05 level.						
b. Adjustment for multiple comparisons: Bonferroni.						

Conclusion

In conclusion, the study provides evidence that self-defense training, specifically Krav Maga and Kalaripayattu, can lead to improvement in agility and balance among college women. This highlights the potential of self-defense training as a valuable form of physical activity to improve physical fitness and overall well-being among college women.

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