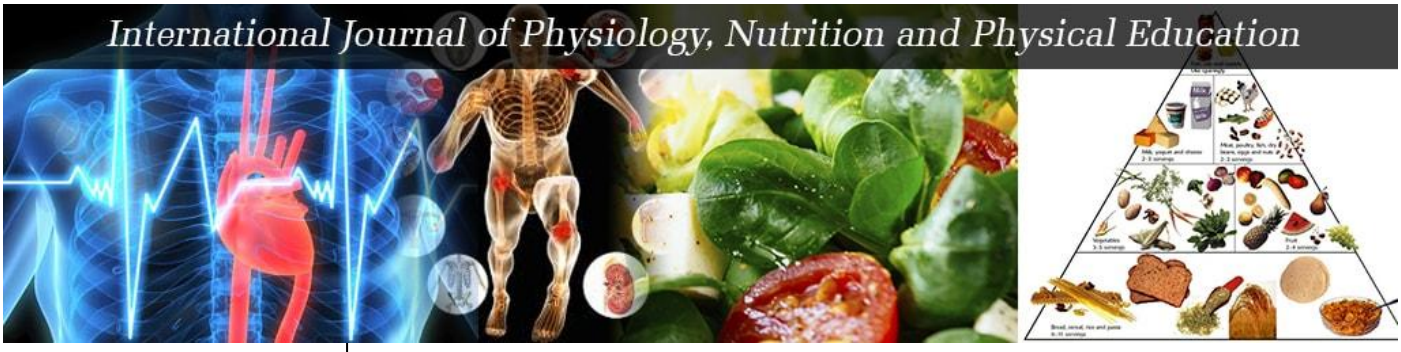

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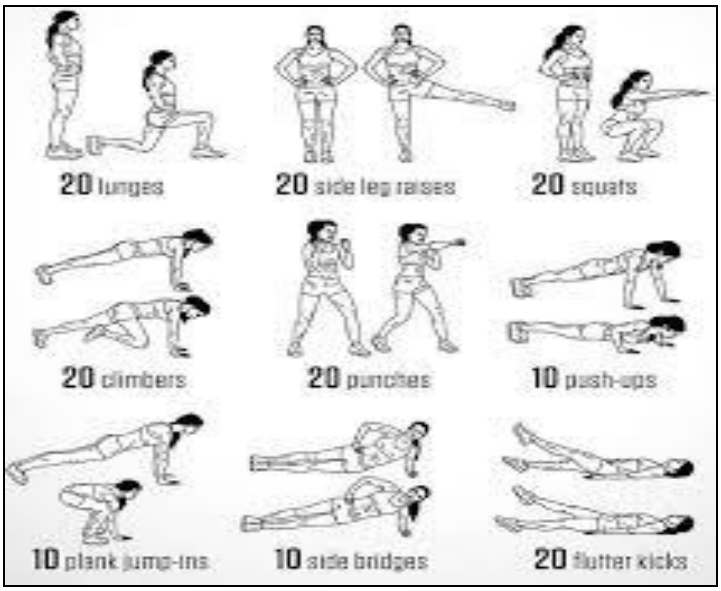
Effect of callisthenic, aerobics exercises and Yogasanas on vital capacity of primary school children

Kum Chennamma D Chilamur and Dr. DM Jyoti

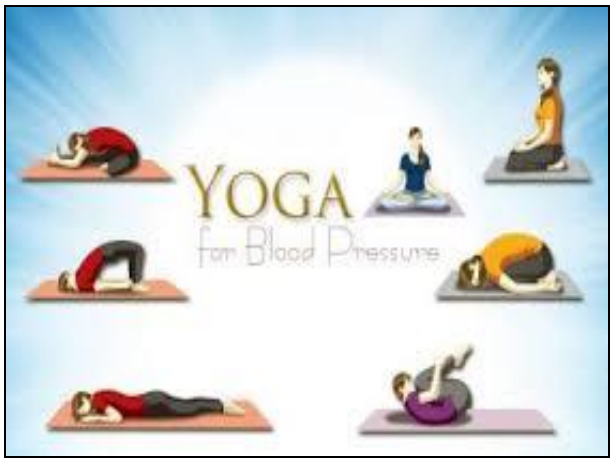
Abstract
The purpose of the present study was to find out the "Effect of Callisthenic Exercises, Aerobics and Yogasanas on Physical and Vital Capacity of Primary School Children's". The selected subjects 100 Girls and the Age Levels was 09 to 12 Years. Were divided into three Experimental Groups and a Control Group with Twenty-Five subjects in each (n=25) Experimental Group-I underwent Callisthenic Exercises, (n=25) Experimental Group-II underwent Aerobics Exercises, (n=25) Experimental Group-III underwent Yogasanas and (n=25) Control Group-IV served as Control Group for the training period of Twenty-One (21) Weeks.

Keywords: Callisthenic, aerobics exercises, Yogasanas and vital capacity

Introduction
Physical Education is that phase of education which is concerned, first, with the organization and leadership of children in big-muscle activities to gain the development and adjustment inherent in the activities according to social standards and second, with the control of health or growth, continues naturally, associated with the leadership of the activities so that the educational process may go on without growth handicaps. Physical education should aim to improve the mass of students and to give them as much health strength and stamina as possible them to perform the duties that awards them after they leave the college.



Callisthenic exercise is all time favorite means of developing physical condition. Exercises serves as a warm up routine for other activities and it generally provides an let for the need for something vigorous especially when a particular lesion requires the pupils to observe and listen more than usual.



Aerobic exercises can become anaerobic exercises if performed at a level of intensity that is too high. Aerobic exercise not only improves fitness; it also has known benefits for both physical and emotional health. Aerobic exercise can help prevent or reduce the chance of developing some cancers, diabetes, depression, cardiovascular disease, and osteoporosis. An aerobic exercise plan should be simple, practical, and realistic. Specific equipment (such as cardio machines) may be used but is not necessary for successful aerobic exercise. Imagine that you're exercising.

Yoga is one of the most ancient cultural heritages of India. The word yoga in Sanskrit means “to unite” and so yoga can be said to connote a unitive discipline.

Vital capacity refers to the ratio of maximum of air exhaled after the deepest possibility of inhalation

Methodology

The purpose of the present study was to find out the “Effect of Callisthenic Exercises, Aerobics and Yogasanas on Physical and Vital Capacity of Primary School Children’s”. The selected subjects 100 Girls and the Age Levels was 09 to 12 Years. Were divided into three Experimental Groups and a Control Group with Twenty-Five subjects in each (n=25) Experimental Group-I underwent Callisthenic Exercises, (n=25) Experimental Group-II underwent Aerobics Exercises, (n=25) Experimental Group-III underwent Yogasanas and (n=25) Control Group-IV served as Control Group for the training period of Twenty-One (21) Weeks.

Independent Variables

Callisthenic Exercises

1. Arm rotation
2. Trunk forward bending and back
3. Trunk bending – Sideways: Left and Right

Aerobics Exercises

1. V-Step
2. L-Step
3. Zig-Zag Step

Yogasanas

Standing Asanas: Suryanamaskar, Garudasana.

Sitting Asanas: Padmasana, Paschimottanasana.

Supine Asanas: Matsysana, Naukasna.

Proline Asanas: Bhujangasana, Dhanurasana.

Dependent Variable

SI. No	Variable	Tools	Measurement
1	Vital Capacity	Wet Spiro Meter	Seconds

Analysis and Interpretation of Data

Hypothesis: There is no significant differs between four Groups (Control, Callisthenic Exercise, Aerobics Exercise and Yogasana) with respect to pre-test and post-test Vital Capacity scores of Primary School Children.

To achieve this hypothesis, the Analysis of covariance (ANCOVA) (pre-test scores as covariate) technique has been applied and the results are presented in the following table.

Table 1: Mean of pre-test and Adjusted Mean of post-test Vital Capacity scores with Comparison between four Groups (Control, Callisthenic Exercise, Aerobics Exercise and Yogasana) with respect to pre-test and post-test Vital Capacity scores of Primary School Children by Analysis of covariance (ANCOVA).

Groups	Pre-test		Post-test		
	Mean	SD	Mean	SD	Adjusted Mean
Control Group	488.00	66.58	482.00	61.03	479.01
Callisthenic Exercise Group	489.00	40.23	654.00	72.05	650.22
Aerobics Exercise Group	486.00	58.67	724.00	143.70	722.61
Yogasana Group	474.00	77.89	682.00	59.30	690.16
F-test	0.3100@		50.0485#		
P-value	0.8180		0.0001*		
Pair wise comparison of four groups by Tukeys multiple post hoc procedures					
Control Vs Callisthenic Exercise			p=0.9999		p=0.0001*
Control Aerobics Exercise			p=0.9995		p=0.0001*
Control Vs Yogasana			p=0.8573		p=0.0001*
Callisthenic Exercise Vs Aerobics Exercise			p=0.9983		p=0.0091*
Callisthenic Exercise Vs Yogasana			p=0.8302		p=0.5699
Aerobics Exercise Vs Yogasana			p=0.9045		p=0.2190

*p<0.05, @one way ANOVA applied, # ANCOVA applied

The results of the above table clearly show the following:

From the results of the above table represents the mean of pre-test and adjusted mean of post-test Vital Capacity scores of Primary School Children in four Groups. The pre-test Mean Vital Capacity scores in Control Group is 488.00±66.58 as compared to 489.00±40.23 in Callisthenic Exercise Group 486.00±58.67 in Aerobics Exercise Group and 474.00±77.89 in Yogasana Group. But mean post-test Vital Capacity scores are higher in Aerobics Group (724.00±143.70) as compared to Yogasana Group (682.00±59.30) followed by Callisthenic Exercise Group (654.00±72.05) and Control Group (482.00±61.03). The adjusted mean of post-test Vital Capacity scores of Primary School Children are presented in the above table.

- The four groups (Control, Callisthenic Exercise, Aerobics Exercise and Yogasana) do not differencesignificantly with respect to pre-test Vital Capacity scores of Primary School Children (F=0.3100, p>0.05) at 5% level of significance. It means that, the pre-test Vital Capacity scores of Primary School Children are similar in Control Group, Callisthenic Exercise Group, Aerobics Exercise Group and Yogasana Group.
- A four groups (Control, Callisthenic Exercise, Aerobics Exercise and Yogasana) difference significantly with respect to post-test Vital Capacity scores of Primary School Children (F=50.0485, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the post-test Vital Capacity scores are different in four Groups (Control, Callisthenic Exercise, Aerobics Exercise and Yogasana). It means that, the post-test Vital Capacity scores of Primary School Children are significantly higher in Aerobics Exercise Group as compared to Callisthenic Exercise Group and Yogasana Group followed by control Group.

Further, if F is significant, to know the pair wise comparisons of four groups (Control, Callisthenic Exercise, Aerobics Exercise and Yogasana) of Primary School Children's by applying the Tukeys multiple post hoc procedures and the results are presented in the above table. It shows that,

- The Control Group and Callisthenic Exercise Group difference significantly with respect to post-test Vital Capacity scores of Primary School Children (p<0.05) at 5% level of significance. It means that, the post-test Vital Capacity scores of Primary School Children are significantly smaller in Control Group as compared to Callisthenic Exercise Group.
- The Control Group and Aerobics Exercise Group difference significantly with respect to post-test Vital Capacity scores of Primary School Children (p<0.05) at 5% level of significance. It means that, the post-test Vital Capacity scores of Primary School Children are significantly smaller in Control Group as compared to Aerobics Exercise Group.
- The Control Group and Yogasana Group difference significantly with respect to post-test Vital Capacity scores of Primary School Children (p<0.05) at 5% level of significance. It means that, the post-test Vital Capacity scores of Primary School Children are significantly smaller in Control Group as compared to Yogasana Group.
- The Callisthenic Exercise Group and Aerobics Exercise Group difference significantly with respect to post-test Vital Capacity scores of Primary School Children (p<0.05) at 5% level of significance. It means that, the post-test Vital Capacity scores of Primary School Children are higher in Aerobics Exercise Group as compared to Callisthenic Exercise Group.
- The Callisthenic Exercise Group and Yogasana Group do not difference significantly with respect to post-test Vital Capacity scores of Primary School Children (p>0.05) at 5% level of significance. It means that, the post-test Vital Capacity scores of Primary School Children are similar in Callisthenic Exercise Group and Yogasana Group.
- The Aerobics Exercise Group and Yogasana Group do not difference significantly with respect to post-test Vital Capacity scores of Primary School Children (p>0.05) at 5% level of significance. It means that, the post-test Vital Capacity scores are similar in Aerobics Exercise Group and Yogasana Group. The mean scores of pre-test and post-testVital Capacity scores of Primary School Children in four Groups (Control, Callisthenic Exercise, Aerobics Exercise and Yogasana) are also presented in the following figure.

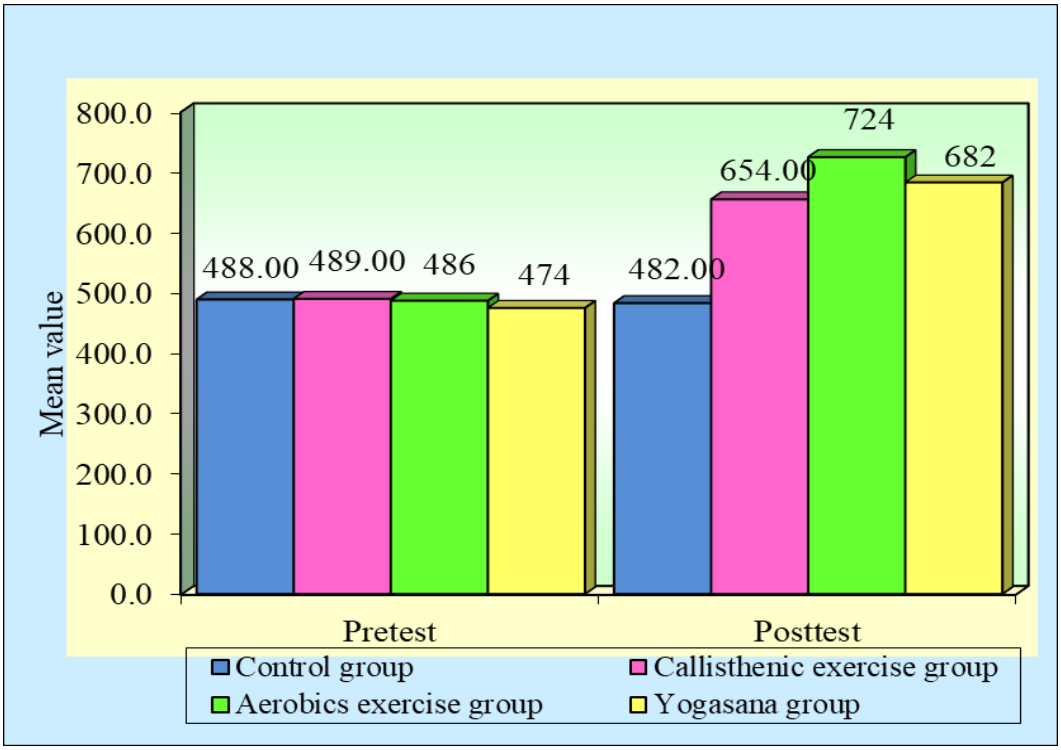


Fig 1: Comparison of four Groups with respect to pre-test and post-test Vital Capacity scores of Primary School Children.

The above figure 1 Indicates that the Comparison of four Groups with respect to pre-test and post-test Vital Capacity scores of Primary School Children.

Discussion on the Hypothesis

The Hypothesis was formulated on the reasoning that practices of Callisthenic, Aerobics and Yogasanas leads to increase the Physical and Physiological Fitness among the practitioners, because regular involvement in Callisthenic, Aerobics and Yogasanas activates develops Vital Capacity in muscle and joints. Experimental and Control indicates the influence of Callisthenic, Aerobics and Yogasanas more on Control Group, in pre-test Mean was 488.00 and post-test mean 482.00, Experimental Callisthenic Exercises Group in pre-test Mean was 489.00 and post-test 654.00, Aerobics Exercises Group pre-test Mean was 486 and post-test 724, and Yogasanas Group pre-test Mean was 474 and post-test 682. The Aerobics Group has higher Vital Capacity than by Callisthenic and Yogasanas Group.

Hypothesis: There is no significant difference between pre-test and post-testVital Capacity scores of Primary School Children in four Groups (Control, Callisthenic Exercise, Aerobics Exercise and Yogasana).

To achieve this hypothesis, the paired t-test was applied and the results are presented in the following table.

Table 2: Comparison pre-test and post-test Vital Capacity scores of Primary School Children in four Groups (Control, Callisthenic Exercise, Aerobics Exercise and Yogasana).

Group	Test	Mean	Std. Dv.	Mean Diff.	SD Diff.	Paired- t	P-value
Control Group	Pre-test	488.00	66.58	6.00	36.29	0.8268	0.4165
	Post-test	482.00	61.03				
Callisthenic Exercise Group	Pre-test	489.00	40.23	-165.00	78.06	-10.5685	0.0001*
	Post-test	654.00	72.05				
Aerobics Exercise Group	Pre-test	486.00	58.67	-238.00	121.86	-9.7653	0.0001*
	Post-test	724.00	143.70				
Yogasana Group	Pre-test	474.00	77.89	-208.00	40.00	-26.0000	0.0001*
	Post-test	682.00	59.30				

*$p<0.05$

The results of the above table, it can be seen that the following:

- No significant difference was observed between pre-test and post-test Vital Capacity scores of Primary School Children in Control Group (t=0.8268, p>0.05) at 5% level of significance. Hence, the null hypothesis is accepted and alternative hypothesis is rejected. It means that, the pre-test and post-test Vital Capacity scores of Primary School Children in Control Group are similar.
- A significant difference was observed between pre-test and post-test Vital Capacity scores of Primary School Children in Callisthenic Exercise Group (t=-10.5685, $p<0.05$) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the post-test Vital Capacity scores are significantly higher as compared to pre-test Vital Capacity scores of Primary School Children in Callisthenic Exercise Group.
- A significant difference was observed between pre-test and post-testVital Capacity scores of Primary School Children in Aerobics Exercise Group (t=-9.7653, $p<0.05$) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the post-test Vital Capacity scores are significantly

higher as compared to pre-test Vital Capacity scores of Primary School Children in Aerobics Exercise Group.

- A significant difference was observed between pre-test and post-test Vital Capacity scores of Primary School Children in Yogasana Group (t=-26.0000, $p<0.05$) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the post-test Vital Capacity scores are significantly higher as compared to pre-test Vital Capacity scores of Primary School Children in Yogasana Group.

Further, the effect size of each group after intervention programme was calculated by using Wilks Lambda and partial eta and the results are presented in the following table.

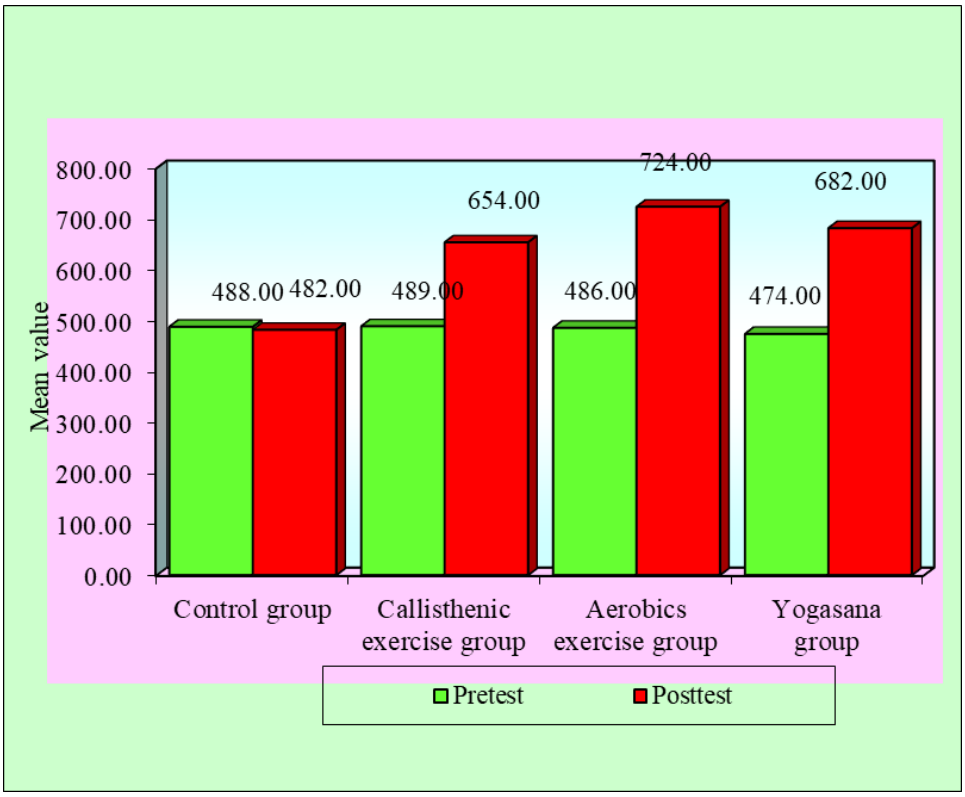


Fig 2: Comparison Mean of pre-test and post-test Vital Capacity scores of Primary School Children in Control, Callisthenic Exercise, Aerobics Exercise and Yogasana Group.

The above figure 2 Indicates that the Comparison of Mean of pre-test and post-test Vital Capacity scores of Primary School Children in Control, Callisthenic Exercise, Aerobics Exercise and Yogasana Group.

Discussion on the Hypothesis

The Hypothesis was formulated on the reasoning that practices of Callisthenic, Aerobics and Yogasanas leads to increase the Physical and Physiological Fitness among the practitioners, because regular involvement in Callisthenic, Aerobics and Yogasanas activates develops Vital Capacity in muscle and joints. Experimental and Control indicates the influence of Callisthenic, Aerobics and Yogasanas more on Control Group, in pre-test Mean was 488.00 and post-test mean 482.00, Experimental Callisthenic Exercises Group in pre-test Mean was 489.00 and post-test 654.00, Aerobics Exercises Group pre-test Mean was 486 and post-test 724, and Yogasanas Group pre-test Mean was 474 and post-test 682. The Aerobics Group has higher Vital Capacity than by Callisthenic and Yogasanas Group.

Table 3: Effect size of treatment in four Groups (Control, Callisthenic Exercise, Aerobics Exercise and Yogasana) by repeated measures of ANOVA.

Summary	Control Group	Callisthenic Exercise Group	Aerobics Exercise Group	Yogasana Group
Wilks Lambda	0.6840	111.6920	95.3600	676.0000
P-value	0.4170	0.0001*	0.0001*	0.0001*
Effect size by partial Eta	0.0280	0.8230	0.7990	0.9660

*$p<0.05$

The results of the above table reveal the following:

- The effect size of the intervention program me on Vital Capacity scores of Primary School Children in Control Group is 0.0280, which was found to be not significant (Wilks lambda=0.6840, $p>0.05$) at 5% level of significance.
- The effect size of the intervention program me on Vital Capacity scores of Primary School Children in Callisthenic Exercise Group is 0.8230, which was found to significant (Wilks lambda=111.6920, $p<0.05$) at 5% level of significance.
- The effect size of the intervention program me on Vital Capacity scores of Primary School Children in Aerobics Exercise Group is 0.7990, which was found to significant (Wilks lambda=95.3600, p<0.05) at 5% level of significance.
- The effect size of the intervention program me on Vital Capacity scores of Primary School Children in Yogasana

Group is 0.9660, which was found to significant (Wilks lambda=676.0000, $p<0.05$) at 5% level of significance. The mean of pre-test and post-test Vital Capacity scores of Primary School Children in Control, Callisthenic Exercise, Aerobics Exercise and Yogasana Groups are also presented in the following figure.

Conclusions

The pre-test Vital Capacity scores of Primary School Children are similar in Control Group, Callisthenic Exercise Group, Aerobics Exercise Group and Yogasana Group. The post post-test Vital Capacity scores are different in four Groups (Control, Callisthenic Exercise, Aerobics Exercise and Yogasana). The post-test Vital Capacity scores of Primary School Children are similar in Control Group and Callisthenic Exercise Group. The post-test Vital Capacity scores are similar in Aerobics Exercise Group and Yogasana Group. The post-test Vital Capacity scores are significantly smaller as compared to pre-test Vital Capacity scores of Primary School Children in Yogasana Group.

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