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Effect of Pranayam on Learning Ability of Adolescent Boys

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Abstract: ***The purpose of the study was to determine the effect of 12 weeks Pranayama programme on student's learning ability. Total 90 students were taken as subjects within the age group of 13 to 16 years. Three groups were formed having 30 subjects each. The Group A and Group B were served as experimental groups and Group C was treated as the Control Group. The experimental Group A and B were given pranayama treatment for 12 weeks. The pranayama programmes of Group A and B were different. The statistical analysis of research data revealed that the experimental groups, administered with different types of pranayama as allotted to their groups had showed significant gains in learning ability variables after administration of pranayama programmes for duration of 12 weeks.***
Keywords: Pranayama, Learning Ability

I. INTRODUCTION

The term Pranayama, a Sanskrit word, translates as 'control of prana' and prana is basically our life-force or energy. It is a separate 'arm' of yoga, intended to clear and cleanse the body and the mind. It makes a fantastic preparation for meditation, helping to center the focus the mind. The scientific study of learning was carried on primarily by psychologists. The skill to understand navigates learning. Responding to a situation basing on the earlier experiences depicts learning. Growth initiate the passage for learning as both physical and physiological aspects along with psychological status makes a leap in every stages of life till reaching adulthood. There are many activities which indicate that learning resembles with acquiring a language, memorizing a rhyme, operating a computer and like. There are many of activities which cannot be specified about their presence in the human being and is depicted on one's behaviour. These are mannerisms, sporting gestures and many more. This learning continues throughout life. Learning abilities are pre-requisites for every individual especially for the adolescent school students.

The purpose of the study was to determine whether participation in 12 weeks Pranayama programme effects the student's learning ability or not.

Methodology:

Total 90 students belonging to S R High School, Baliapal, Balasore of Odisha State were taken as subjects within the age group of 13 to 16 years. The selection of subjects was being done randomly and being divided into three groups having 30 numbers of subjects each. Among the three groups the Group A and Group B were served as experimental groups and Group C was treated as the Control Group. The experimental Group A and B were given pranayama treatment for 12 weeks. The pranayama programmes of Group A and B were different. Group A was given treatment of Ujjayi Pranayama, Shitali Pranayama, Kapalbhati pranayama and Bhramari Pranayama whereas Group B was treated with Anuloma Viloma Pranayama, Suryabhedam Pranyama, Bhastrika Pranyama and Shitkari Pranayama. The control group (Group C) did not practice in any type of pranayama and allowed to continue with the normal programme of the School.

Following learning ability variables were measured prior to the treatment of pranayama to both the experimental groups. After 12 weeks of treatment the post-test on the listed variables were measured for statistical analysis.

1) Memory: Word Series test, Digit Span test, Passage Comprehension test
2) Concentration: Listening Comprehension test, Number Detection test

Analysis of data was made through application of analysis of variance and analysis of covariance finding significant differences among groups along with finding out the inter-group variability towards comparison between initial and final scores with regard to individual parameters under study. Further, effect of initial score towards achieving final or terminal scores was estimated taking the initial score as covariate and then subjected to analysis to evaluate the effect of treatments concisely.

Table 1. Analysis of variance along with covariance of averages in word series test (points).

	Pranayam Group A	Pranayam Group B	Control	Sum of squares	df	Mean square	F ratio
Pre test means	11.35± 0.03	11.35± 0.03	11.42± 0.04	B 2.093 W 1300.98	2 87	0.048 0.042	0.323
Post test means	12.71[a]± 0.03	12.73[a]± 0.04	11.44[b]±0 .05	B 224.640 W 893.500	2 87	16.426 0.049	335.473**
Adjusted post test means	12.73[a]± 0.02	12.75[a]± 0.02	11.40[b]± 0.02	B 35.225 W 1.255	2 86	17.612 0.015	117.413**

* Significant ($p<0.05$), N = 90, B = Between group, W = Within group

ANOVA for word series test revealed that non-significant 'F' ratio of 0.323 was obtained in comparison of average pre test scores of three groups. Corresponding estimate for scores after experiment period was 335.473, showing its significance. Critical 'F' ratio for significance at $p<0.05$ (df 2, 87) was 3.07. As the pre test scores were different at the beginning, the same was used as covariate to obtain the adjusted post test scores and these were put for analysis of covariance to examine for any significance of differences among them. Thus the obtained 'F' ratio of 117.413 was found to be highly significant.

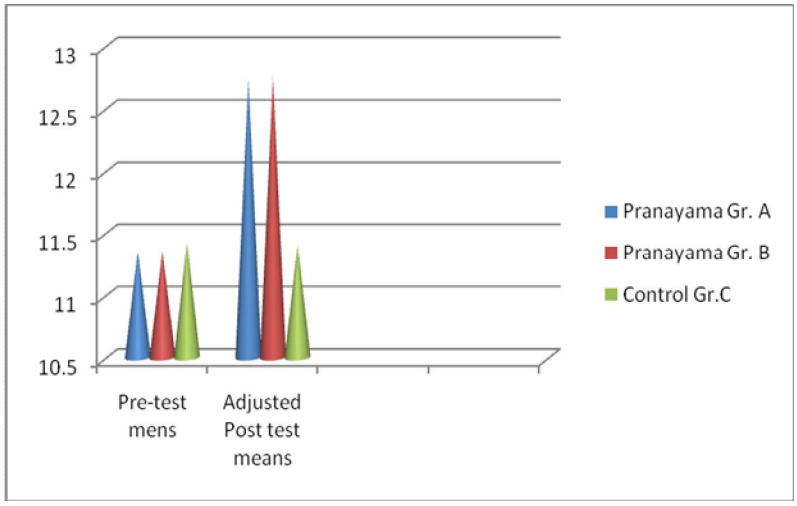


Fig 1. Comparison of word series test (points) among groups

Table 2. Analysis of variance along with covariance of averages in digit span test (points).

	Pranayam Group A	Pranayam Group B	Control	Sum of squares	df	Mean square	F ratio
Pre test means	17.38± 0.16	17.57± 0.18	17.58± 0.19	B 0.720 W 82.425	2 87	0.360 0.947	0.380
Post test means	19.97[a]± 0.10	20.06[a]± 0.11	17.62[b]± 0.18	B 114.647 W 45.011	2 87	57.323 0.517	110.799**
Adjusted post test means	20.06[a]± 0.04	20.02[a]± 0.04	17.58[b]± 0.04	B 121.329 W 3.564	2 86	60.664 0.041	147.961**

* Significant ($p<0.05$), N = 90, B = Between group, W = Within group

ANOVA for digit span test revealed that non-significant 'F' ratio of 0.380 was obtained in comparison of average pre test scores of three groups. Corresponding estimate for scores after experiment period was 110.799, showing its high significance. Critical 'F' ratio for significance at $p<0.05$ (df 2, 87) was 3.07. As the pre test scores were different at the beginning, the same was used as covariate to obtain the adjusted post test scores and these were put for analysis of covariance to examine for any significance of differences among them. Thus the obtained 'F' ratio of 147.961 was found to be significant.

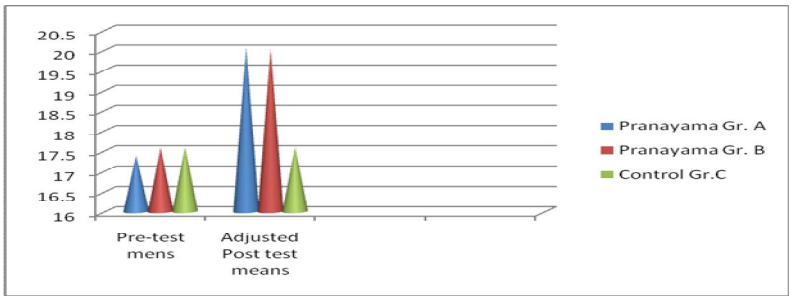


Fig 2. Comparison of digit span test (points) among groups

Table 3. Analysis of variance along with covariance of averages in comprehension test (points).

	Pranayam Group A	Pranayam Group B	Control	Sum of squares	df	Mean square	F ratio
Pre test means	34.42± 0.11	34.36± 0.08	34.27± 0.08	B 0.337 W 21.027	2 87	0.168 0.242	0.696
Post test means	36.58^{a}± 0.31	36.42^{a}± 0.13	34.47^{b}±0. 08	B 82.531 W 104.181	2 87	41.265 1.197	34.460**
Adjusted post test means	36.47^{a}± 0.04	36.41^{a}± 0.04	34.60^{b}± 0.04	B 66.497 W 48.003	2 86	33.248 0.558	59.566**

* Significant ($p<0.05$), N = 90, B = Between group, W = Within group

ANOVA for comprehension test revealed that non-significant 'F' ratio of 0.696 was obtained in comparison of average pre test scores of three groups. Corresponding estimate for scores after experiment period was 34.460, showing its significance. Critical 'F' ratio for significance at $p<0.05$ (df 2, 87) was 3.07. As the pre test scores were different at the beginning, the same was used as covariate to obtain the adjusted post test scores and these were put for analysis of covariance to examine for any significance of differences among them. Thus the obtained 'F' ratio of 59.566 was found to be significant.

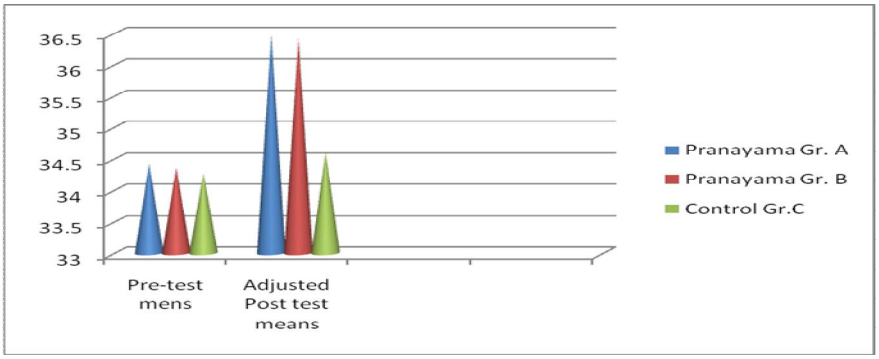


Fig 3. Comparison of comprehension test (points) among groups

Table 4. Analysis of variance along with covariance of averages in listening comprehension test (points).

	Pranayam Group A	Pranayam Group B	Control	Sum of squares	df	Mean square	F ratio
Pre test means	9.30±0.01	9.31±0.01	9.31±0.0 1	B 0.003 W 0.438	2 87	0.002 0.005	0.313
Post test means	9.63^{a}±0.02	9.63^{a}±0.02	9.30^{b}±0. 02	B 2.113 W 1.031	2 87	1.056 0.012	89.123**
Adjusted post test means	9.64^{a}±0.01	9.63^{a}±0.01	9.30^{b}±0. 01	B 2.279 W 0.236	2 86	1.140 0.003	415.735**

* Significant (p<0.05), N = 90, B = Between group, W = Within group

ANOVA for sit up revealed that non-significant 'F' ratio of 0.313 was obtained in comparison of average pre test scores of three groups. Corresponding estimate for scores after experiment period was 89.123, showing its significance. Critical 'F' ratio for significance at p<0.05 (df 2, 87) was 3.07. As the pre test scores were different at the beginning, the same was used as covariate to obtain the adjusted post test scores and these were put for analysis of covariance to examine for any significance of differences among them. Thus the obtained 'F' ratio of 415.735 was found to be significant.

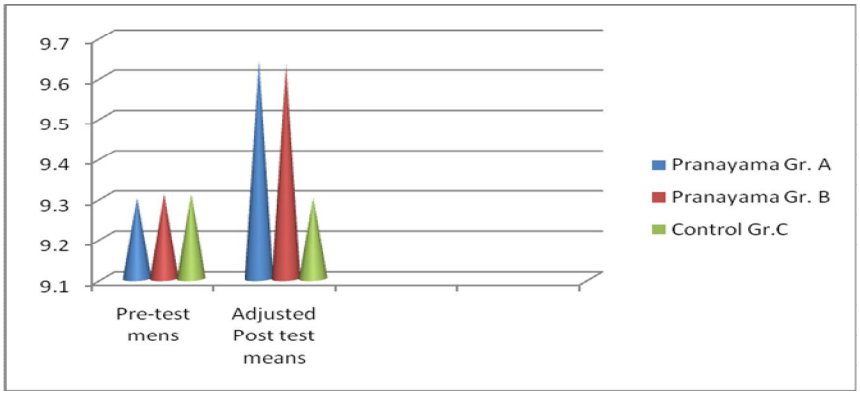


Fig 4. Comparison of listening comprehension test (points) among groups

Table 5. Analysis of variance along with covariance of averages in number detection test (points).

	Pranayam Group A	Pranayam Group B	Control	Sum of squares	df	Mean square	F ratio
Pre test means	73.65±0.25	73.73±0.24	73.70±0.24	B 0.098 W 159.272	2 87	0.049 1.831	0.027
Post test means	76.92[a]±0.26	76.30[a]±0.25	73.65[b]±0.24	B 181.109 W 125.934	2 87	90.555 1.448	62.558**
Adjusted post test means	76.95[a]±0.15	76.28[a]±0.15	73.64[b]±0.15	B 183.288 W 57.79	2 86	91.644 0.672	136.379**

* Significant (p<0.05), N = 90, B = Between group, W = Within group

ANOVA for number detection test revealed that non-significant 'F' ratio of 0.027 was obtained in comparison of average pre test scores of three groups. Corresponding estimate for scores after experiment period was 62.558, showing its significance. Critical 'F' ratio for significance at p<0.05 (df 2, 87) was 3.07. As the pre test scores were different at the beginning, the same was used as covariate to obtain the adjusted post test scores and these were put for analysis of covariance to examine for any significance of differences among them. Thus the obtained 'F' ratio of 136.379 was found to be highly significant.

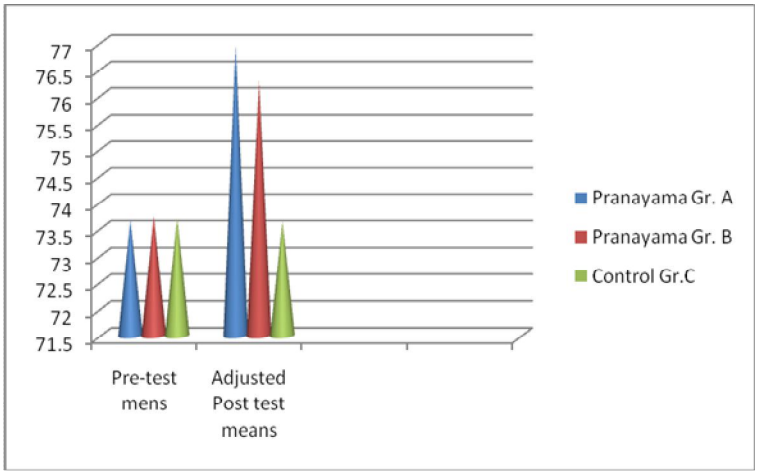


Fig 5. Comparison of number detection test (points) among groups

Table 6. Analysis of variance along with covariance of averages in number detection test (score).

	Pranayam Group A	Pranayam Group B	Control	Sum of squares	df	Mean square	F ratio
Pre test means	235.18±0.17	235.22±0.16	235.10±0.22	B 0.222 W 88.158	2 87	0.111 1.013	0.109
Post test means	232.77^{a}±0.19	232.90^{a}±0.17	235.14^{b}± 0.17	B 106.399 W 82.547	2 87	53.199 0.949	56.070**
Adjusted post test means	232.82^{a}±0.07	232.94^{a}±0.07	235.25^{b}± 0.07	B 114.618 W 11.652	2 86	57.309 0.135	422.985**

* Significant ($p<0.05$), N = 90, B = Between group, W = Within group

ANOVA for number detection test revealed that non-significant 'F' ratio of 0.109 was obtained in comparison of average pre test scores of three groups. Corresponding estimate for scores after experiment period was 56.070, showing its significance. Critical 'F' ratio for significance at $p<0.05$ (df 2, 87) was 3.07. As the pre test scores were different at the beginning, the same was used as covariate to obtain the adjusted post test scores and these were put for analysis of covariance to examine for any significance of differences among them. Thus the obtained 'F' ratio of 422.985 was found to be non-significant.

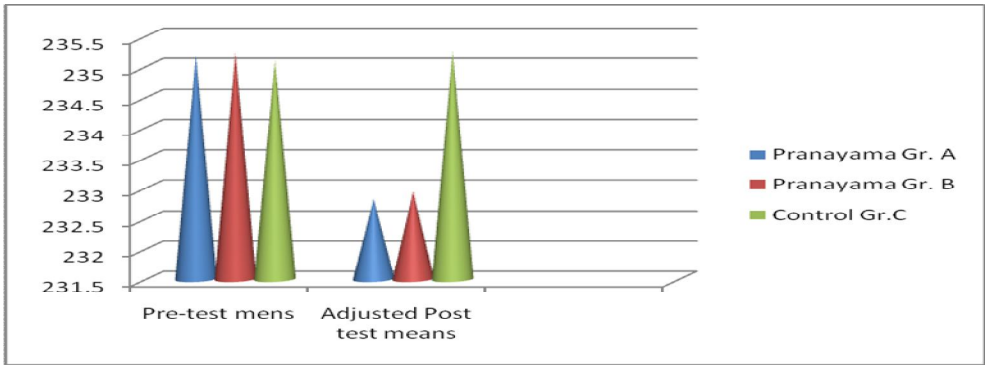


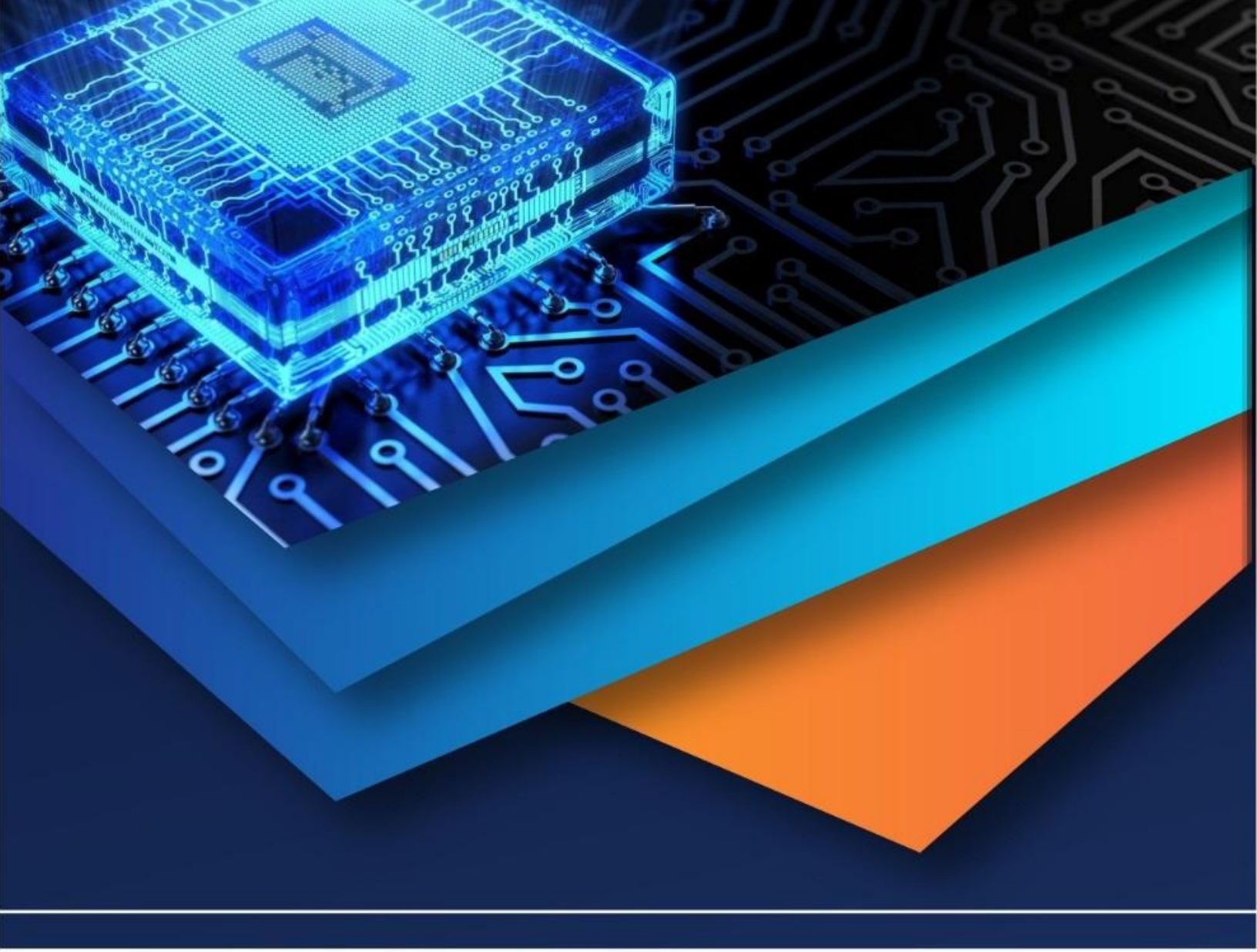
Fig 6. Comparison of number detection test (score) among groups

II. DISCUSSION ON FINDINGS

The statistical analysis of research data revealed that the experimental groups, administered with different types of pranayama as allotted to their groups had showed significant gains in learning ability variables after administration of pranayama programmes for duration of 12 weeks. The control group did not show any significant increase on the performance of any variable under study. Precisely, the experimental groups (pranayama group A and B) compared with that of control group showed significant gain in performance of learning ability variables, under memory such as word series test, digit span test, passage comprehension test, under concentration which includes listening comprehension test and number detection test subjects.

III. CONCLUSION

Summing up the results in the present study it may be concluded that, non-pharmacological interventions like pranayama along with some modification in life style may be encouraged to improve leaning ability in adolescent boys, which is the primary influencing factor for building the career afterwards.



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