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BODY MASS INDEX: EFFECTS OF MEDITATION AND PRANAYAMA PRACTICE PROGRAM

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Abstract: The primary objective of the study is to determine the effects of meditation and pranayama on body mass index (BMI). The forty five female collegiate students selected for the present study were divided into three equal groups called, Experimental group I (Meditation Group), experimental II (Pranayama group) and Control group, consisting of 15 Female students in each group. They were the students of graduate Course and their age ranged from 18 to 25 years during the academic year 2016-17. The entire sample were directed to assemble in a multipurpose hall Padmpani College of Physical education to seek their willingness, to act as subjects. The result of the study reveals that there were significant difference were found in Body Mass Index (BMI) (F= P<.05) among Meditation , Pranayama and Control group .

Keywords: Meditation, Pranayama, BMI

I. INTRODUCTION

BMI stands for Body Mass Index is also known as the Quetelet index, is the ratio of body weight to height. It has become the old method to determine the prevalence of overweight and obesity and to set standards (Heiberg,2006). It is a measure of a person's weight relative to his height. It is not a direct measurement of a person's total body fat, but rather an indicator. In most cases BMI is related to total body fat, which means that as someone's BMI score increases, so does their total body fat. While BMI is an accurate estimate of total body fat in most people, there are some exceptions , (Nuttall,2015). Yoga is one such intervention, with studies reporting long-term adherence and benefits in various health conditions, including obesity. A 2021 study found that continuous yoga practice significantly decreased BMI and body fat mass (BFM) in an intervention group after eight and 12 weeks. The study also found that the yoga group's muscle mass increased at a rate of 0.515 per week (Poomiphak 2021).

Yoga can help in weight loss in many ways. A 2022 review of Diseases found 22 studies that indicated that yoga helped reduce total body weight, body mass index (BMI), body fat percentage, and waist circumference in participants with obesity. A 2016 review of 30 randomized trials found that yoga can reduce BMI in overweight and obese people, but doesn't affect weight, body fat percentage, or waist circumference. Research interest on meditation back to the 1960s, the breakthrough in the scientific evidence on health benefits of meditation largely took place during the 1980s and 1990s. There is a tremendous amount of scientific evidence on the positive effects of meditation as part of a healthy lifestyle. Study results demonstrate that there is a significant decrease in Body Mass Index (BMI), in the study group after 45 minutes of *Suryanamaskara* and heating *Pranayama* practice for 4 weeks, while there is no improvement in the control group (Geetarani et.al.2024). The engaging in regular meditation practices is particularly apparent in the prevention of several chronic diseases, including: obesity, depression and cardiovascular disease.

II. METHODS

Three groups were targeted viz.Meditation group, Pranayama Group and control . Forty five college girls selected for the study . Training was given to Meditation group, Pranayama Group separately. Purposive sampling method was used, as the researcher selected young girls with a specific purpose.

Target Group

The subjects selected for the present study were divided into three equal groups called, Experimental group I (Meditation Group), experimental II (Pranayama group) and Control group, consisting of 15 Female students in each group. They were the students of graduate Course and their age ranged from 18 to 25 years during the academic year 2016-17. The entire sample were directed to assemble in a multipurpose hall Padmpani College of Physical education to seek their willingness, to act as subjects.

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Pranayama and Meditation Practice program

The yogic Pranayama includes Kapalbhati ,Anulom Vilom and Bhastrika .Yogic Pranayama the demonstration was given to the subjects . Pranayama and meditation programme was planned for 12 weeks, 5 days a week and 60 minutes a day. Meditation programme was prepared by the investigator on consultation with experts. It consists of meaning, types, uses and techniques of meditation including **Basic** (Agna, Moolathara and Thuria) and **Nine Centres Meditation** (Moolathara, Swathitana, Maniporaga, Anagatha, Vishukthi, Agna , Thuria, Thurithedha and Thuvathasangam). They were explained through video presentation which was of 20 minutes in duration in local language . Then it was enacted by the subjects under the supervision of the investigator. The result computed also crosschecked by using following statistical variables. Mean, standard deviation, ANOVA and LSD post hoc test.

Measurement of BMI

The **body mass index** (**BMI**), or **Quetelet index**, is a measure for human body shape based on an individual's mass and height. It was devised between 1830 and 1850 by the Belgian polymath Adolphe Quetelet during the course of developing "social physics".

Formula oBMI

The formulae universally used in medicine produce a unit of measure of kg/m^2. BMI can also be determined using a BMI chart,which displays BMI as a function of mass (horizontal axis) and height (vertical axis) using contour lines for different values of BMI or colors for different BMI categories.

$$\text{BMI} = \frac{\text{mass(kg)}}{(\text{height(m)})^2}$$

$$= \frac{\text{mass(lb)}}{(\text{height(in)})^2} \times 703 \quad \dagger$$

Procedures

Height was measured with a wall-mounted stadiometer (SECA). The subjects stood erect, without shoes, and with their hands to their sides. All values for height were rounded to the nearest 0.1 cm. Body weight was measured to the nearest 0.1 kg with a calibrated digital scale (TANITA BWB-800A).

Soring

Body mass index was calculated as weight (kg) divided by height (m^2). All values for BMI were rounded to the nearest 0.1 $kg{\cdot}m^{-}$.

III. RESULTS

TABLE -1
PRE-TEST MEAN SCORES AND STANDARD DEVIATION OF BODY MASS INDEX (BMI) AMONGMEDITATION GROUP PRANAYAMA GROUP AND CONTROL GROUP

COMPONENTS	GROUP	SAMPLE SIZE	MEAN	S.DS
Body Mass Index (BMI)	Meditation group	15	18.67	2.25
	Pranayama group	15	21.07	2.02
	Control group	15	18.67	1.55

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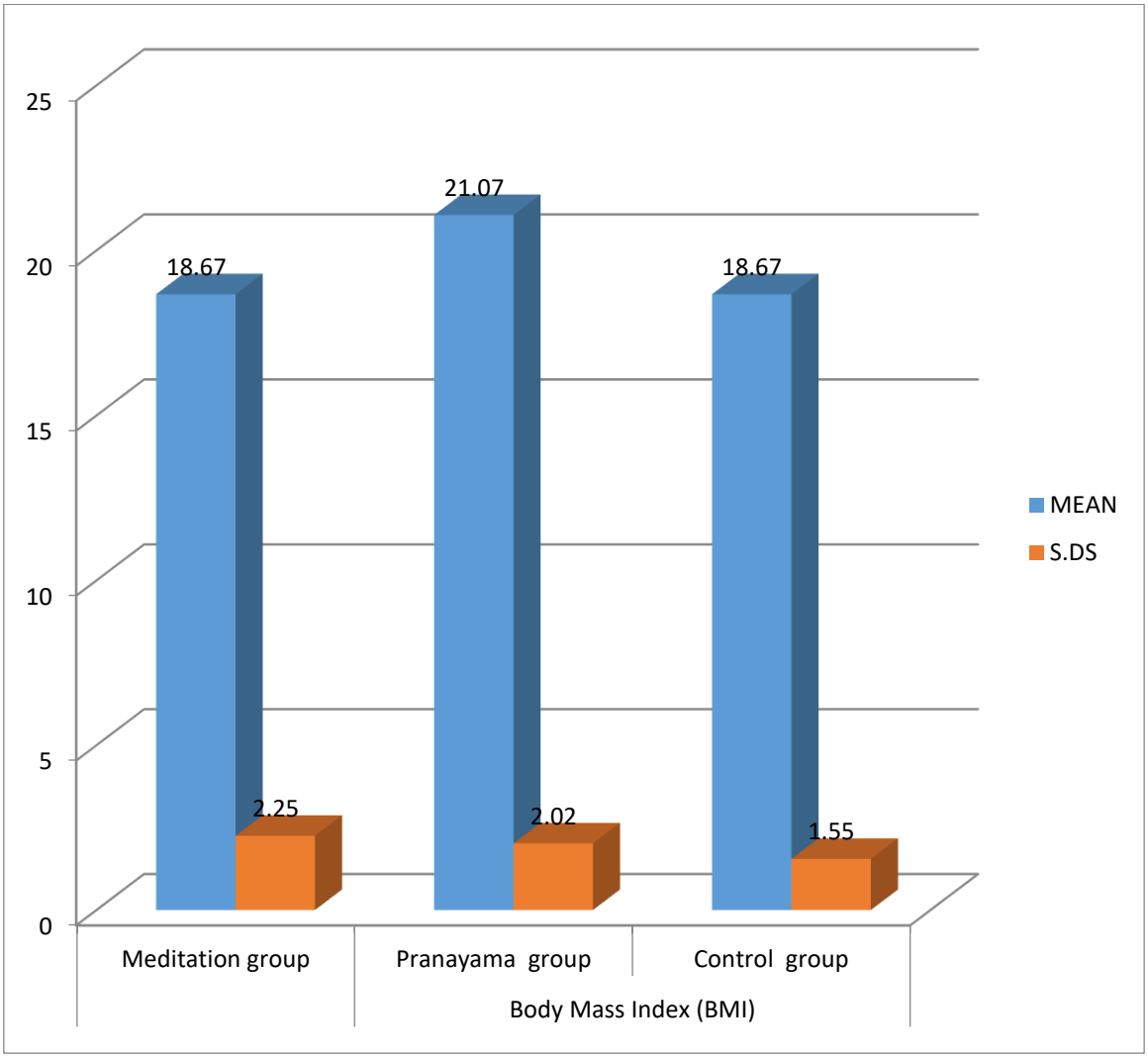
Table-1 shows that the Pre-Test mean scores, standard deviation of Meditation, Pranayama and Control with respect to Body Mass Index (BMI). With regards to Pre-Test mean score of Body Mass Index (BMI) of Meditation group was obtained 18.67

The Pre-Test mean score of Body Mass Index (BMI) of Pranayama group was 21.077 and Pre-Test mean score of Body Mass Index (BMI) of Control group was 18.67 respectively. However the standard deviation of Pre-Test Body Mass Index (BMI) of meditation group was 2.25, Pre-Test Body Mass Index (BMI) of Pranayama group was obtained 2.02 and standard deviation of Pre-Test Body Mass Index (BMI) of control group was obtained 1.55 respectively,

Pre-Test mean scores, standard deviation of Meditation, Pranayama and Control group with respect to Body Mass Index (BMI) are presented graphically in figure-1

FIGURE – 1
SHOWS THAT THE PRE TEST MEAN SCORES, STANDARD DEVIATION OF MEDITATION, PRANAYAMA AND CONTROL GROUPWITH RESPECT TO BODY MASS INDEX (BMI) .



In order to find out the significant difference of pre-test Body Mass Index (BMI) among Meditation, Pranayama and Control group, one way analysis of variance was used to compare the Body Mass Index (BMI) of pre-test .

The results of one way Analysis of variance of pre-test Body Mass Index (BMI) among three group of sample is presented in Table 54

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TABLE – 2
ONE WAY ANALYSIS OF VARIANCE SHOWS THE COMPARISON OF PRE-TEST BODY MASS INDEX (BMI) AMONG MEDITATION , PRANAYAMA AND CONTROL GROUP

Sr. No.	Components	Source of Variance	DF	SS	MSS	F-ratio
1.	Body Mass Index (BMI)	Between group	2	3.08	1.54	1.18 NS
		Within group	42	54.67	1.30	

Table-2 shows the statistical comparison of pre-test Body Mass Index (BMI) among Meditation, Pranayama and Control group.

The result of the study reveals that there were no significant difference were found in pre-test Body Mass Index (BMI) (F= 1.18) among Meditation , Pranayama and Control group .

Post-test mean scores and standard deviation of Body Mass Index (BMI) among meditation group ,pranayama group and control group has been presented in table-2

TABLE 3
POST-TEST MEAN SCORES AND STANDARD DEVIATION OF BODY MASS INDEX (BMI) AMONGMEDITATION GROUP PRANAYAMA GROUP AND CONTROL GROUP

COMPONENTS	GROUP	SAMPLE SIZE	MEANS	S.DS
Body Mass Index (BMI)	Meditation group	15	18.47	1.84
	Pranayama group	15	20.41	1.67
	Control group	15	18.53	1.63

Table 3 shows that the Post-Test mean scores, standard deviation of Meditation, Pranayama and Control with respect to Body Mass Index (BMI).

With regards to Post-Test mean score of Body Mass Index (BMI) of Meditation group was obtained 18.47 The Post-Test mean score of Body Mass Index (BMI) of Pranayama group was 20.41 and Post-Test mean score of Body Mass Index (BMI) of Control group was 18.53 respectively.

However the standard deviation of Post-Test Body Mass Index (BMI) of meditation group was 1.84, Post-Test Body Mass Index (BMI) of Pranayama group was obtained 1.67 and standard deviation of Post-Test Body Mass Index (BMI) of control group was obtained 1.63 respectively,

Post-Test mean scores, standard deviation of Meditation, Pranayama and Control group with respect to Body Mass Index (BMI) are presented graphically in figure-2

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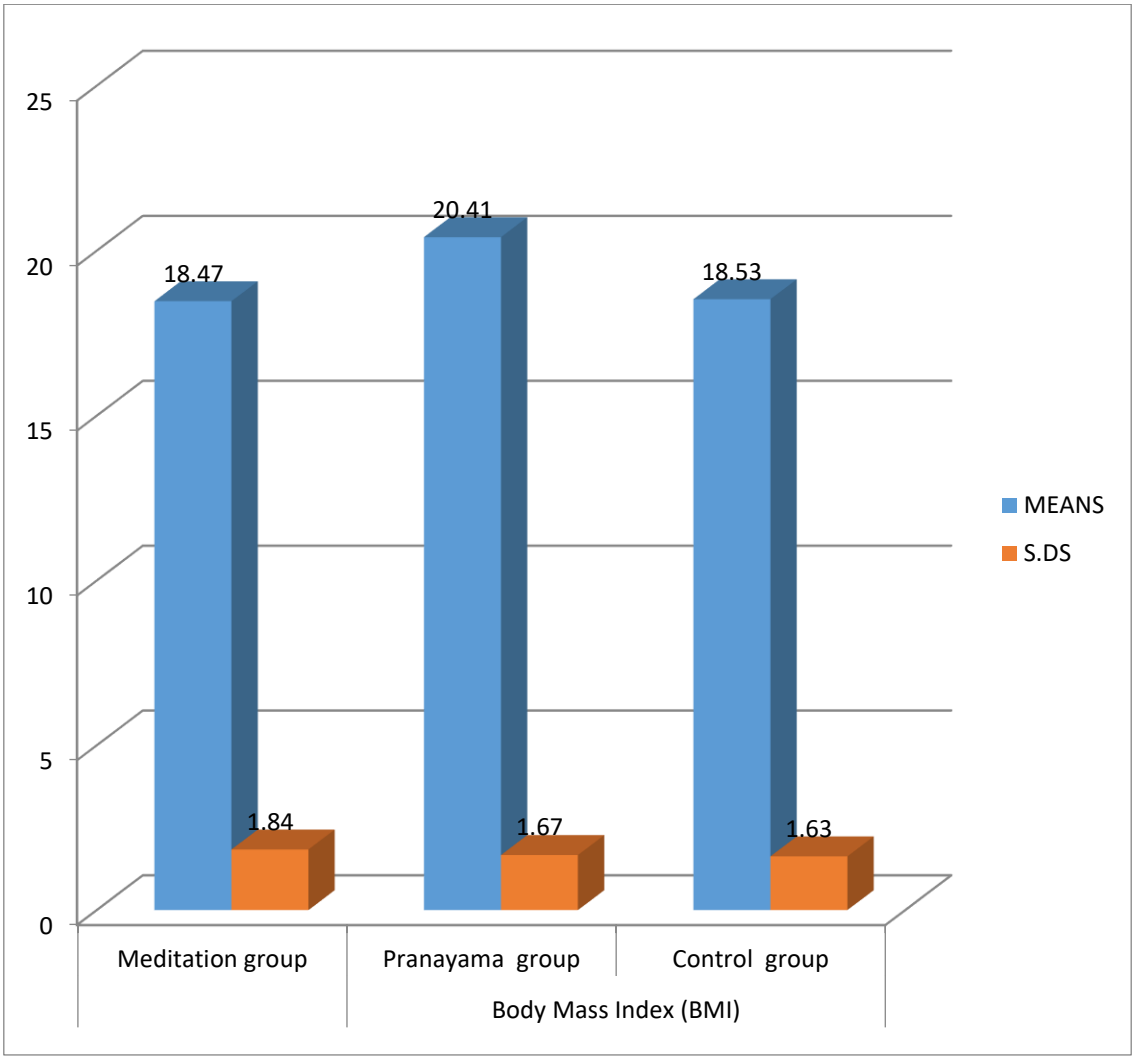
FIGURE – 2
SHOWS THAT THE PRE TEST MEAN SCORES, STANDARD DEVIATION OF MEDITATION, PRANAYAMA AND CONTROL GROUP WITH RESPECT TO BODY MASS INDEX (BMI).



In order to find out the significant difference of post-test Body Mass Index (BMI) among Meditation, Pranayama and Control group, one way analysis of variance was used to compare the Body Mass Index (BMI) of post-test .

The results of one way Analysis of variance of post-test Body Mass Index (BMI) among three group of sample is presented in Table 4

TABLE – 4
ONE WAY ANALYSIS OF VARIANCE SHOWS THE COMPARISON OF Post-Test BODY MASS INDEX (BMI) AMONG MEDITATION GROUP, PRANAYAMA GROUP AND Control GROUP

Sr. No.	Components	Source of Variance	DF	SS	MSS	F-ratio
1.	Body Mass Index (BMI)	Between group	2	6.91	3.45	3.28*
		Within group	42	44.12	1.05	

Table-4 shows the statistical comparison of pots-test Body Mass Index (BMI) among Meditation , Pranayama and Control group.

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The result of the study reveals that there were significant difference were found in Body Mass Index (BMI) (F= 3.28,P<.05) among Meditation , Pranayama and Control group .

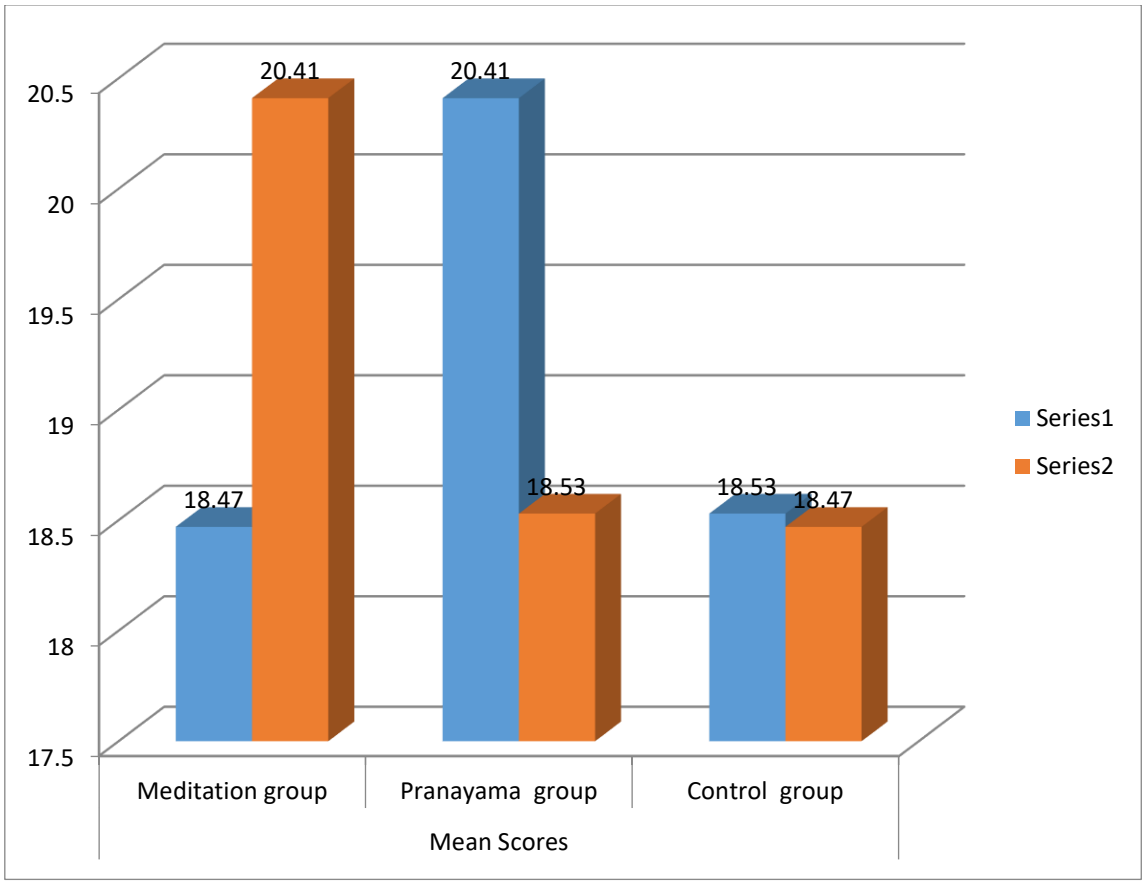
TABLE – 5
L.S.D. POST HOC STATISTICAL COMPARISON FOR BODY MASS INDEX (BMI) OF MEDITATION GROUP, PRANAYAMA GROUP AND CONTROL GROUP .

Mean Scores			Mean difference.	C.D. at 5% level
Meditation group	Pranayama group	Control group		
18.47	20.41		1.94	1.78*
18.47		18.53	0.06	1.78 NS
	20.41	18.53	1.88	1.78*

*Significant at .05 level

Table 57 shows that the L.S.D. post hoc statistical comparison for Body Mass Index of Meditation , Pranayama and Control group.

FIGURE-3
L.S.D. POST HOC STATISTICAL COMPARISON FOR BODY MASS INDEX (BMI) OF MEDITATION , PRANAYAMA AND CONTROL GROUP



IV. DISCUSSION

It had been hypothesised that , there would be significant differences of the effect of the Meditation and Pranayama on Body Mass Index among college women . With regards to Pre-Test mean score (Table-1) of Body Mass Index (BMI) of Meditation group was obtained 18.67 The Pre-Test mean score of Body Mass Index (BMI) of Pranayama group was 21.077 and Pre-Test mean score of Body Mass Index (BMI) of Control group was 18.67 respectively.

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However the standard deviation of Pre-Test Body Mass Index (BMI) of meditation group was 2.25, Pre-Test Body Mass Index (BMI) of Pranayama group was obtained 2.02 and standard deviation of Pre-Test Body Mass Index (BMI) of control group was obtained 1.55 respectively, The result of the study (Table-2) reveals that there were no significant difference were found in pre-test Body Mass Index (BMI) (F= 1.18) among Meditation , Pranayama and Control group . In addition, the Post-Test mean score(Table-3) of Body Mass Index (BMI) of Meditation group was obtained 18.47 The Post-Test mean score of Body Mass Index (BMI) of Pranayama group was 20.41 and Post-Test mean score of Body Mass Index (BMI) of Control group was 18.53 respectively. However the standard deviation of Post-Test Body Mass Index (BMI) of meditation group was 1.84, Post-Test Body Mass Index (BMI) of Pranayama group was obtained 1.67 and standard deviation of Post-Test Body Mass Index (BMI) of control group was obtained 1.63 respectively, The result of the study (Table-4) reveals that there were significant difference were found in Body Mass Index (BMI) (F= 3.28,P<.05) among Meditation , Pranayama and Control group .

The findings of the study , (Table 5) illustrates that, Statistically significant difference of post-test Body Mass Index was found between meditation group and pranayama group, the meditation group was less Body Mass Index as compare than pranayama group, However, No significant difference of post-test Body Mass Index was found between meditation group and control group whereas, Statistically significant difference of post-test Body Mass Index was found between pranayama group and control group , the pranayama group was control more Body Mass Index as compare than control group . Thus the hypothesis regarding, there would be significant differences of the effect of the Meditation and Pranayama on Body Mass Index among college women was accepted.

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