

# A Study was Under taken to Assess the Effectiveness of Structured Teaching Program on Knowledge Regarding Various Methods to Check the Placement of Nasogastric Tube in Patients among Student Nurses

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**Abstract:** *The normal healthy adult can consumes food orally. Patients who are unconscious, surgery on throat, paralysis of soft palate, requires nasogastric tube feeding. In hospitals, nutrition may refer to the food requirements of patients, including nutritional solutions delivered via an IV (intravenous) or fluid food delivered by Nasogastric tube. It refers to the process of placing a soft plastic Nasogastric through a patient's nostril, past the pharynx down the esophagus in to the patient stomach.*

*The most common indication for inserting a Nasogastric tube is to deliver tube feeding to patients when they are unable to eat especially, Patient who have undergone neck or facial surgery or patient on mechanical ventilation. It is used to empty the stomach when accidental poisoning or drug overdose has occurred, and it is also used to remove air that accumulate in the stomach during cardio pulmonary Resuscitation. It is used to remove the stomach content after major trauma or surgery to prevent aspiration of the stomach content. Placing Nasogastric tube helps to prevent Nausea and vomiting by removing stomach contents and preventing distension of the stomach other a patient has a bleeding ulcer, bowel obstruction, or other gastrointestinal disease. It helps to be inserted to take samples of stomach contents for laboratory studies and to test for pressure of the gastrointestinal tract.*

## **Materials and Methods:**

*A quasi-experimental single group pre-test post-test design to evaluate the effectiveness of structured teaching program on knowledge regarding various methods to check the placement of nasogastric tube in patients. The study conducted on 50 student nurses. Data was collected in the month of August - September 2022. Data was collected using structured questionnaire to evaluate the effectiveness of structured teaching program on knowledge regarding various methods to check the placement of nasogastric tube in patients.*

## **Results:**

*The data revealed that, the significant level stated as  $P < 0.05$ . Overall pre-test mean score was 16.92. The overall post-test mean score was 26.32. The comparison was analyzed by using paired 't' test and value was 23.20. This was found statistically significant at  $< 0.05$  level of degree of freedom. Then final findings were associated with demographic variable in educational status was significant and other demographical variable such as age, gender, current residence, previous source of information was not significant.*

*Conclusion: After the detailed analysis of the study it shows that structured teaching program on knowledge regarding various methods to check the placement of nasogastric tube is effective in enhancing knowledge about same among student nurses. A relationship between the students and the teachers helps to empower the knowledge in the students to deal adequately with the patients with nutritional needs.*

**Keywords:** Nasogastric Tube, Structured Teaching Program

## I. INTRODUCTION

Nutrition is the science, that deals with all various factor of food is composed to many way in which proper nourishment is brought to provide material to all growth, and maintenance, repair, and reproduction of cells. The importance of feeding is to promote wound healing and normal immune response. Good nutrition means getting enough macronutrients and micronutrients. Macronutrients contain calories (energy): proteins, carbohydrates, and fats. They help you maintain our body weight. Micronutrients include vitamins and minerals. They keep our cells working properly, but will not prevent weight loss.

The importance of maintaining normal nutritional requirement is essential for maintaining healthy functioning of cells and tissue of the body. The common nutritional problem of adult it includes night blindness, anemia, and malnutrition, underweight. Malnutrition can also be defined as the insufficient, excessive or imbalanced consumption of nutrients.

The common practices of nurses in maintaining the correct placement is achieved by, after the insertion the nurse have the primary responsibility to check the placement of Ryle's tube before feeding.

Thousands of year before, Terri Schiavo started getting feed through a tube, people tried to find a ways to nourish those unable to eat. The type of feeding is oral feeding, nasogastric feeding, and oro-gastric feeding and intravenous feeding. Oral feeding is assisting the patient while taking feed; nasogastric feeding is administered fluid food through nose, mouth or stomach through nasogastric tube. Fluid food is administered through orogastric tube is called oro-gastric feeding. Intravenous feeding is the administration of total nutrition through intravenous route.<sup>1</sup>

The various methods employed to check the placement of nasogastric tube are auscultation it was introduced by Rene-Theophile- Hyac in the Laennec. Is a technical term for listening to the internal sound of the body, usually using a stethoscope. The various methods used to check the placement of feeding tube by placing stethoscope over the epigastric area first and from the right lower rib margin to the right mid auxiliary line to find out the placement of distal end of feeding tube.

NG tube placement can be checked by pH test. The term pH was first introduced by Danish Chemist Soren Peder Lauritz Sorensen at the Carlsberg laboratory in 1909. And used to check pH of aspirant's. This is common bed side method used to find out the placement of feeding tube.<sup>2</sup> Nasogastric tube misplacement into the airways is one type of complication of feeding tube.

Over the past 30 to 40 years of advancement in feeding tube techniques, nutritional formula have been made the provisional of nutritional support possible for most intensive care unit patients. It is assumed that nutrient depletion is associated with increased morbidity and mortality.<sup>4</sup> The placement of feeding tube is a common practice in most surgical unit. Proper feeding tube placement is essential to achieve the successive administration of fluid food and incorrect placement can have devastating result.<sup>5</sup> Avoiding incorrect placement is important, as serious morbidity or mortality could result if a nasogastric tube is placed improperly. Accidental placement of feeding tube into the trachea can cause direct injury to the lungs, including bleeding or lung puncture. Infusing fluids, feeding into the lungs could result in pneumonitis and infection, Nausea, vomiting, constipation, lung aspiration, tube clogging, hyperglycemia and electrolyte alteration.<sup>6</sup> So the Importance of using various methods for checking the placement of feeding tube is necessary.

The most popular method of confirming feeding tube placement continues to be auscultation of insufflates air over the stomach. Although commonly used, there is abundant evidence that the Auscultatory method alone is unreliable and another method to find out the placement of feeding tube by aspiration of gastric content check the pH with the help of pH strip.

Tube feeding has been widely preferred over parental nutrition in adult with functioning of gastro intestinal tract, when the need for the tube feeding is expected to be 6 week or less. It is estimated that between 7500000 and 1,000,000 Nasogastric tube are used in adult per year in India.<sup>6</sup>

A Study was conducted in surgical unit for assessing the placement of feeding tube by auscultation and testing of pH method. This study describes gastro intestinal aspirates for pH were obtained from 52 critically ill patient age from 38 to 85 years. Auscultatory and testing pH were compared. The location of NG tube is determined by radiography were investigated using the auscultatory and pH method and concurrently researches aspirates fluid from the feeding tube pH within 5 minutes of radiographs taken to determine the NG tube location. pH measured with pH strip, check pH by using litmus paper also. The result of this study mean pH level in the gastro intestinal aspirates was 4.23.

Approximately 89 percentage of this pH fluid were between 0.5 the pH of less than 5 successfully identified 90.4 percentage of correct placement of feeding tube cases. The conclusion of this study revealed that the pH method is effective in determining the feeding tube position, but the auscultation method is not effective to find out the feeding tube position.<sup>2</sup>

The importance of Nurses to learn the correct insertion and placement of feeding tube because, it is a common and necessary procedure performed in surgical unit. In Surgical unit almost 75 percent of patient nutrition is achieved by nasogastric feeding. The tube feeding method is first one is nasal intubations is the simplest and most commonly used route for gaining access to the gastro intestinal tract. So the Nurses have to learn skillfully about the insertion and placement of feeding tube in order to save the life of the patient by administering fluid-food through the Nasogastric tube. Before feeding the Nurses have to ensure the Nasogastric tube placement in order to avoid complication.<sup>3</sup>

At present, the Nurses using common bedside method for ensuring the placement of feeding tube is auscultation, but only by using auscultation for confirming the feeding tube placement the result showing is unreliable. With the help of aspirated gastric content, check the pH with strip is a substitute method of auscultation for confirming the correct placement of feeding tube. The use of Radiographic is considered as a golden method for assessing the placement of feeding tube. So the Nurses have to learn thoroughly about a detection of correct placement of feeding tube by using other methods like visualizing gastric aspirations, measuring length of NG tube, auscultation, checking bubbling, pH testing, radiography, capnometry out of this methods, checking pH method for the verification of NG tube among the student nurse knowledge should be refreshed for the future advancement.

Study was conducted to assess the malposition of insertion of nasogastric tube is common with 32% of patients who had intra-bronchial misplacement ultimately having nasogastric tubes wrongly placed multiple times. In 1978, farmstead and martin 15 reported the complication of intracranial passage when a nasogastric tube was inserted in patient with a basal skull fracture. Advanced trauma life support (atls) guidelines now advise against insertion of Nasopharyngeal airways or nasogastric tubes in these circumstances.

## **II. OBJECTIVES OF STUDY**

1. To assess the pre-test knowledge on various methods to check the placement of nasogastric tube in patients among student nurses.
2. To assess the post-test knowledge on various methods to check the placement of nasogastric tube in patients among student nurses.
3. To compare the pre and post- test knowledge on various methods to check the placement of nasogastric tube in patients among student nurses.
4. To find association in the pre-test knowledge score level with selected socio-demographic variable among student nurses.

## **III. MATERIALS AND METHODS**

A quasi-experimental single group pre-test post-test design to evaluate the effectiveness of structured teaching program on knowledge regarding various methods to check the placement of nasogastric tube in patients. The study conducted on 50 student nurses. Data was collected in the month of August – September 2022. Data was collected using structured questionnaire to evaluate the effectiveness of structured teaching program on knowledge regarding various methods to check the placement of nasogastric tube in patients.

Phase (1) -A descriptive survey approach was adopted to assess the depression among patients.

Phase (2) -In Phase II of the study an evaluative approach was used to measure the effectiveness of structured teaching program on knowledge regarding various methods to check the placement of nasogastric tube in patients among student nurses. A quasi-experimental single group pre-test post-test design to evaluate the effectiveness of structured teaching program on knowledge regarding various methods to check the placement of nasogastric tube in patients among student nurses. The study conducted on 50 student nurses. Data was collected using structured questionnaire. A questionnaire included socio demographic data and knowledge questionnaire to assess the knowledge about methods to check the placement of nasogastric tube in patients among student nurses.

Structured teaching program was introduced was and later post-test was conducted.

### Section A: Socio Demographic Data

It includes 6 items such as age, gender, qualification, and current residence etc.

**Section B: Knowledge questionnaire** on various methods to check the placement of nasogastric tube.

### Section C: structured teaching program on knowledge regarding various methods to check the placement of nasogastric tube.

The content validity of questionnaire was established by experts. The experts were selected on the basis of their expertise, experience and interest in the problem being studied. They were from different specialties i.e. Nursing, Psychology, Education, Research, and Statistics. They were requested to give their opinions on the appropriateness and relevance of the items in the tool. Necessary modifications were made as per the expert's advice. The reliability of the questionnaire was established by Split Half method and was found to be  $r=0.87$ .

Final study was conducted on 50 student nurses. Data was collected in the month of August – September 2022. The sample for the study comprised of student nurses, who met the designated criteria were selected through convenient sampling technique. Objectives of study was discussed and obtained consent for participation in study. Existing knowledge of student nurses about methods to check nasogastric tube in position was assessed by administering a structured assessment questionnaire, followed by administration of STP and Post-test was taken. Based on the objective and the hypothesis the data was analyzed by using various statistical tests i.e. percentage, mean, and standard deviation.

### Statistical Methods

The significance was calculated by using mean, standard deviation, unpaired t statistics, paired t statistics for comparison and the Chi-square statistics is used to find the independence of difference. Significance was accepted at 0.01 and 0.05 level of probability.

## IV. RESULTS

### Section I: Description of Socio demographic data of Student Nurses

Findings of section I table 1 shows that out of 50 Samples Majority of the Student nurses belonged to age group 26-30 years i.e. 21(42%) and 20(40%) between 31-35 years and followed by 09(18%) to 20–25 years. With regard gender 36(72%) were female and 14(28%) were male. With respect to educational status, 14(28%) were GNM and 36(72%) were B. Sc. (N) With regard to current residence, 38(76%) were residing at rented homes and 12(24%) were residing at their own house. The most of the Student nurses 28(56%) were Hindu, 22(44%) were Christian. Previous source of information 36(74%) were got during the class period and 14(26%) were got information through in service education.

**Table 1:** Description of Socio demographic data of Student Nurses

N=50

S. No	Socio Demographic Variable	Respondents	
		Frequency (f)	Percentage (%)
1	<b>Age in Years</b>		
	20-25	09	18
	26-30	21	42
	31-35	20	40
2	<b>Gender</b>		
	Male	14	28
	Female	36	72
3	<b>Educational Status</b>		
	GNM	14	28
	B. Sc. (N)	36	72

4	<b>Current Residence</b>		
	Hospital	00	00
	Rented	38	76
	Own	12	24
5	<b>Religion</b>		
	Hindu	28	56
	Christian	22	44
	Muslim	00	00
6	<b>Previous Source of Information</b>		
	During class period	36	74
	In service education	14	26

**SECTION B: Assessment of the effectiveness of structured teaching programme by comparing pre and post-test mean knowledge score on various methods to check the placement of feeding tube in patients among Student nurses**

**Table 2:** Comparison between aspect wise pre-test and post-test mean knowledge score  
N=50

Aspect wise analysis of knowledge	Max score	Pre-test		Post-test		Enhancement in mean %	t value	p value	inference
		Mean ( $\bar{x}$ )	Mean %	Mean ( $\bar{x}$ )	Mean %				
Anatomy and physiology	06	2.4	48	4.2	84	36	9.428	<0.001	HS
General information	09	6.06	54.54	7.8	70.2	15.66	12.109	<0.001	HS
Placement of NG Tube	11	7.26	61.4	9.2	88.75	27.35	19.576	<0.001	HS
Management and complications	04	2.4	49	3.2	74	25	13.9	<0.001	HS

Table 2 shows overall knowledge the statistical paired 't' test value reflects enhancement of mean knowledge score for all selected knowledge aspects at 0.05 level of significance. In the pre-test knowledge score was considered less compared to post-test performance in all aspects of knowledge under study. The findings showed that maximum mean score found in the aspect of knowledge on placement of NG tube was 7.26 (61.45%) and that in post-test was 9.2(88.75%) and general information (7.8)70.2% anatomy and physiology (4.2)84% management and complication (3.2)74% of NG tube.

**SECTION C: Comparison pretest and posttest knowledge scores on various methods to check the placement of feeding tube in patients among student nurses.**

**Table 3:** Depicts the Comparison pretest and posttest knowledge scores on various methods to check the placement of feeding tube in patients among student nurses.

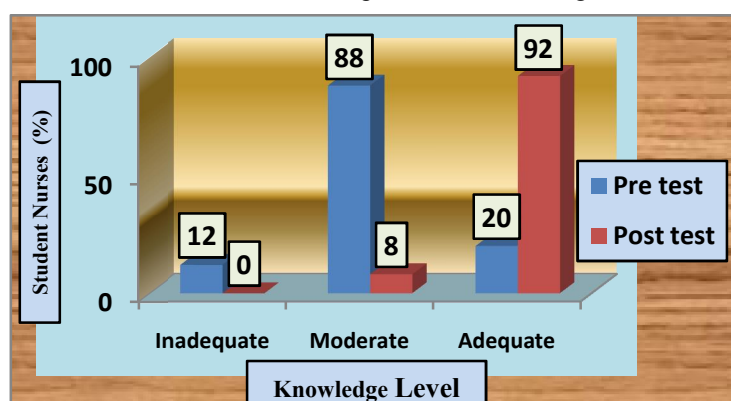
N=50

Sl .	Knowledge Levels	Range of Score	Respondents			
			Pre test		Post test	
			Freq (f)	(%)	Freq(f)	(%)
1	Inadequate	≤ 50 %	06	12	0	0.0

2	Moderately adequate	51-75 %	34	88	04	08
3	Adequate	> 75 %	10	20	46	92
	<b>Total</b>		<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>

Table 3 shows that the levels of knowledge scores of student nurses regarding various method to check the placement of feeding tube, in the pre-test 34(88%) respondents were having Moderately adequate knowledge, 06(12%) were having inadequate knowledge and 10(20%) were had adequate knowledge. Where as in the posttest 46(92%) respondents were having adequate knowledge regarding various methods to check the placement of feeding tube, 04(08%) had moderately adequate knowledge and there was no respondent with inadequate knowledge in the post test.

**Figure 1:** Comparison of pretest knowledge with posttest levels of knowledge of Student nurses regarding various methods to check the placement of feeding tube.



#### SECTION-D: To find the association between the level of knowledge with selected socio- demographic variables of Student nurses

**Table 4:** Association of socio-demographic variables and pretest mean Knowledge scores regarding various methods to check the placement of feeding tube among Student nurses.

N=50

SL	Demographic variables	Respondents	Knowledge of Student Nurses.						$\chi$ Value <sup>2</sup>	P value
			Inadequate Knowledge		Moderately adequate		Adequate			
		N	N 06	%	N 34	%	N10	%		
1.	Age in Years								2.4 NS df= 2	> 0.05
	20-25	09	1	11.1	5	55.5	03	33.3		
	26-30	21	2	9.52	15	71.4	04	19.0		
	31-35	20	3	15	14	70	03	15		
2.	Gender								1.2, NS, df=1	< 0.05
	Male	14	02	14.2	10	71.4	02	14.2		
	Female	36	04	11.1	24	66.6	08	22.2		
3.	Educational Status								4.8 S* df=1	< 0.05
	GNM	14	02	14.2	10	71.4	02	14.2		
	B. Sc. (N)	36	04	11.1	24	66.6	08	22.2		
4.	Current residence								0.89 NS, df=1	
	Hospital	00	00		00		00			
	Rented	38	04	10.5	26	68.4	08	21.0		
	Own	12	02	16.6	08	66.6	02	16.6		



<b>5.</b>	<b>Religion</b>								<b>2.3 NS Df=1</b>	> 0.05
	Hindu	28	02	7.14	22	78.5	04	14.2		
	Christian	22	04	18.1	12	54.5	06	27.2		
	Muslim	00	00		00		00			
<b>6.</b>	<b>Previous Source of information</b>								<b>2.3 NS, df=1</b>	> 0.05
	During training period	37	03	8.10	30	81.0	04	10.8		
	In service	13	03	23.0	04	30.7	06	46.1		
	1- 5 years	09	1	11.1	5	55.5	03	33.3		
	6-10 Years	21	2	9.5	15	71.4	04	19.0		
	11-15 Years	20	3	15	14	70	03	15		

The above table 4 shows the association of level of knowledge with demographic variables of Student nurses on various methods to check the placement of feeding tube. To associate the level of knowledge with demographic variables of Student Nurses the chi-square test has been used.

The obtained chi-square value shows significant association between the pretest level of knowledge educational status 4.8 ( $p < 0.05$ ). But the chi-square value did not show any significant association between the levels of knowledge with other socio- demographic variables.

Hence, the  $H_2$  is accepted only for the educational status. So there will be significant association between level of knowledge scores and selected socio- demographic variables in pretest.

## V. DISCUSSION

Majority of the Student nurses belonged to age group 26-30 years i. e 21(42%) and 20(40%) between 20– 25 years and followed by 09(18%) to 20-25 years. Majority of the Student nurses, 36(72%) were female and 14(28%) were male. With respect to educational status, 14(28%) were GNM and 36(72%) were B. Sc.(N) Majority of the Student nurses, 38(76%) were residing at rented homes and 12(24%) were residing at their own house. The most of the Student nurses 28(56%) were Hindu, 22(44%) were Christian. Previous source of information 36(74%) were got during the training period and 14(26%) were got information through in service education. In the pretest, 34(88%) Student nurses were having Moderately adequate knowledge, 06(12%) were having inadequate knowledge and 10(20%) were had adequate knowledge on various methods to check the placement of feeding tube, mean percentage of respondents pretest level of knowledge on various methods to check the placement NG tube was 56.4%, the mean level of knowledge was 16.92 with standard deviation of 2.04. The findings of post-test level of knowledge was 46(92%) respondents were having adequate knowledge regarding various methods to check the placement of feeding tube, 04(08%) had moderately Adequate knowledge and there was no respondents with inadequate knowledge in the post-test. The means percentage of respondents posttest level of knowledge on various methods to check the placement of feeding tube was 87.32%, the mean level of knowledge was 26.32 with standard deviation of 2.4. The level of knowledge scores of Student nurses regarding various method to check the placement of feeding tube, in the pretest 34(88%) respondents were having Moderately adequate knowledge, 06(12%) were having inadequate knowledge and 10(20%) were had adequate knowledge. Where as in the posttest 46(92%) respondents were having adequate knowledge regarding various methods to check the placement of feeding tube, 04(08%) had moderately adequate knowledge and there was no respondents with inadequate knowledge in the post test.

The mean percentage of posttest score was 87.32% which was significantly higher than the mean percentage of pretest score of 56.4%, the difference in the mean enhancement score was 30.92%. Further, paired “t” value 23.20 of pretest and posttest of the respondents were find to be significant at  $p < 0.05$ . Therefore the findings revealed that the structured teaching programme was effective.

The chi-square value shows significant association between the pre-test level of knowledge educational status 4.8 ( $p < 0.05$ ). But the chi-square value did not show any significant association between the levels of knowledge with other demographic variables.

at 0.05 level.

The Student nurses pretest knowledge score was 34(88%) Student nurses were having moderately adequate knowledge, 06(12%) were having inadequate knowledge and 10(20%) were had adequate knowledge. In the post-test level of knowledge was 46(92%) respondents were having adequate knowledge regarding various methods to check the placement of feeding tube, 04(08%) had moderately adequate knowledge and there was no respondents with inadequate knowledge in the post test.

Hence the stated  $H_1$  is accepted. So there will be significant difference between pretest and posttest knowledge scores on various methods to check the placement of feeding tube Student nurses among at 0.05 levels.

To findings of the study were supported by study on “ implementation of an evidence based clinical protocol for checking various methods to check the placement of feeding tube the methods used to evidence based implementation project” with the pretest and posttest measures by means of questionnaire was selected subjects were interviewed in detail using a structured questionnaire. It is mentionable among the Student nurses believed checking feeding tube placement only by using single method it is causing feeding tube misplacement. Approximately 75% those survive were unaware of using PH method for the placement of feeding tube so we should encourage the nurses to learn new measures for assessing the placement of feeding tube.

Findings of this study were supported by a study on Nutrition Support Nurse Clinicians on 2011.National Health Interview survey, were used to analyze Nasogastric feeding tube placement that minimizes the potential feeding tube misplacement. The first 90% of Student nurses are inserting feeding tube safely. And the placement checked accurately before feeding.

## VI. CONCLUSION

The conclusions were drawn on the basis of the findings of the study on effectiveness of structured teaching program on knowledge regarding various methods to check the placement of nasogastric tube in patientsamong student nurses is effective.

### 6.1 Implications

The findings of the study have certain important implications for the nursing profession in the field of Nursing Practice, Nursing Education, Nursing Administration, Nursing Research and Community Health Nursing.

The Nursing Practice Act (NPA) defines the practice of nursing as those functions including "basic health care, that help people cope with difficulties in daily living that are associated with their actual or potential health or illness problems or the treatment thereof, and that require a substantial amount of scientific knowledge or technical skill including all of the following: direct and indirect patient care services." These direct and indirect patient services include the competence of nurses to provide information about complementary and alternative therapies like Yoga therapy, and to perform complementary and alternative procedures in accordance with the Standards of Competent Performance.

### 6.2 Nursing Education

The nursing personal are challenged to provide standard nursing care, which can be met only by keeping abstract technology. The nurse should know about the newer technologies and measures available for protecting the patient. The nurse also a teacher should educate the junior nurses about the various new methods available to check the placement of the feeding tube accurately. The nurse educator should educate the student in nursing profession so to make them ready to take care of the patients.

### 6.3 Nursing Practice

The current concept of expanded role in nursing practice indicates changing the role and function of the nurses, expanded practice demands increase skills and knowledge that result in significant patient outcome.

The concept of nursing practitioner and nurse clinicians are becoming very popular in western countries who have prospective authority, Such dramatic changes in the nursing profession that is, being more physician hand maiden to independent professional accountability demands that nurses are not only meant for daily care of patient with nasogastric tube feeding.



#### **6.4 Nursing Administration**

The nurse administrator should evaluate the staff that who are working in the surgical unit- the nurses administrator should develop the in-service educational Programs so as to make them aware of the recent changes on checking the placement of feeding tube. They should be motivated so as to participate in the educational programs.

#### **6.5 Nursing Research**

In spite of knowing new methods to check the placement of nasogastric tube, every nurse should know about the checking the placement of feeding tube accurately. Nurse must be motivated to conduct research related to insertion and checking the placement of nasogastric tube especially to safety practices to check the placement of NG tube before feeding to avoid complication.

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