



# **Effect of a Nurse-led Training Programme on Pressure Injury Prevention and Treatment among Nurses in Two Teaching Hospitals in Ogun State, Nigeria**

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## **Authors' contributions**

*This work was carried out in collaboration between both authors. Author OF managed the literature searches, wrote the protocol and designed the study. Author OT performed the statistical analysis, managed the analyses of the study and wrote the first draft of the manuscript. Both authors read and approved the final manuscript.*

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## **ABSTRACT**

**Aims:** Pressure injury is a common health problem associated with rise in treatment cost and lengthy hospital stay. Despite advancements, trainings and researches on pressure injury prevention and treatment, its knowledge and practice among nurses has been low. The study evaluated the effect of a nurse-led training programme on pressure injury prevention and treatment among nurses in two teaching hospitals in Ogun State, Nigeria.

**Study Design:** Two groups pre-test, post-test quasi-experimental study was adopted.

**Methodology:** Researchers included 40 nurses (8 men, 32 women; age range 20-69 years) working in medical and surgical unit using purposive sampling. Participants completed a developed questionnaire to test knowledge pre-intervention and two weeks post-intervention. A developed checklist was used by the researchers to collect data from admitted patients' record on participants

practice pre-intervention and two weeks post-intervention. Data were analysed using descriptive and inferential statistics at 0.05 level of significance.

**Results:** There was 5% increase in control group knowledge and 65% increase in experimental group knowledge. There was 5% increase in control group practice and 65% increase in experimental group practice regarding pressure injury prevention and treatment. Control group mean knowledge gain was 0.016 while experimental group was 0.179. Control group mean practice gain was 0.03 while experimental group was 0.393. Result showed significant difference in effect of a nurse-led training programme on knowledge and practice concerning pressure injury prevention and treatment among nurses in experimental and control group ( $P = .000$ ).

**Conclusion:** Nurses' knowledge and practice concerning pressure injury prevention and treatment can be improved through exposure to training programmes. The study recommended that hospitals should regularly expose nurses to training programmes on pressure injury prevention and treatment to improve the quality of nursing care.

*Keywords: Knowledge; practice; pre-intervention; post-intervention; quasi-experimental study.*

## 1. INTRODUCTION

Pressure injury refers to lesion on the skin due to persistent pressure, friction or moisture leading to destruction of the skin and underlying tissue. Over 95% of pressure injury develop over a bony prominence and major risk factors for pressure injury development are immobility and inactivity [1]. It is a common health problem in chronically ill patients and it negatively affects the patients, their relatives and caregivers [2]. Pressure injury development indicates poor nursing care and the negative effect on patient's health underscores the need to prevent the occurrence in hospitalized patients [3]. The adverse effect of pressure injury has significantly increased leading to lengthy hospitalization and increased cost of care [4]. The incidence of pressure injury in United States is 29.5% among hospitalized patients with greater than 50% incidence in critical care patients [1].

In Nigeria, 50% incidence of pressure injury was found among spinal cord injury patients, 38.6% incidence was found among orthopaedic patients and 11.4% incidence was found among head injury patients which has resulted in great burden and negative effect on patients such as poor patients' care outcome, poor patient care satisfaction, increased cost of hospital care and lengthy hospital stay [5].

A study conducted on pressure injury among spinal cord injury patients in Lagos University Teaching Hospital showed a 57.1% pressure injury incidence rate [6]. A study conducted on pressure injury prevalence among spinal cord injury patients in Gombe State Hospital showed a prevalence of 57% [7]. This studies showed high incidence and prevalence of pressure injury

which may be due to low knowledge and practice concerning pressure injury prevention and treatment among nurses.

Pressure ulcer development has been attributed to poor quality of nursing care and inadequate preventive practice by nurses especially when preventive measures are not implemented early during the period of hospitalization [3]. Pressure ulcer prevention involves risk assessment, identification, staging, documentation and implementation of pressure ulcer preventive measures. Treatment of pressure ulcer is more expensive than prevention so efforts have been directed towards acquisition of skills in preventive care of pressure ulcer rather than treatment [8]. The prevention of hospital acquired pressure injury remains a top priority worldwide with key areas addressed including; nurses training on pressure injury prevention and treatment, training on utilization of standardized risk assessment scale [9]. Despite nurses' exposure to in-service training programmes and continuous nursing education on pressure injury prevention and treatment, knowledge and practice concerning pressure injury prevention and treatment has been low [10]. Despite advancement in pressure ulcer prevention and treatment through discovery of latest preventive measures and treatment approaches, knowledge and practice concerning pressure ulcer prevention and treatment among nurses has been inadequate [11]. These suggest a fundamental problem. Likewise, the researcher through clinical experience has observed high incidence and prevalence of pressure injury. These may be attributed to low knowledge and practice concerning pressure injury prevention and treatment among nurses. These may also be attributed to a gap in the type of training programmes offered to nurses on pressure injury

prevention and treatment as no previous quasi-experimental study combined lecture and discussion method. Hence, the need to evaluate the effect of a nurse-led training programme on pressure injury prevention and treatment among nurse in two teaching hospitals in Ogun State, Nigeria.

## **2. METHODOLOGY**

### **2.1 Study Design**

The study adopted two groups pre-test, post-test quasi-experimental study to evaluate the effect a nurse-led training programme on pressure injury prevention and treatment among nurses in two teaching hospitals in Ogun State between January and February 2017.

### **2.2 Population**

The population were 60 nurses working in the medical and surgical units of Olabisi Onabanjo University Teaching Hospital, Sagamu which formed the experimental group and 48 nurses working in the medical and surgical units of Babcock University Teaching Hospital, Ilishan remo which formed the control group.

#### **2.2.1 Inclusion criteria**

Nurses working in the medical and surgical units were included in the study.

#### **2.2.2 Exclusion criteria**

Nurses on leave at the time of data collection were excluded from the study.

### **2.3 Sample Size and Sampling Technique**

Sample size was determined using Leslie Kish formula. Purposive sampling technique was adopted to select 40 participants (20 participants from Olabisi Onabanjo University Teaching Hospital, Ogun State which formed the experimental group and 20 participants from Babcock University Teaching Hospital, Ogun State which formed the control group) for the study.

### **2.4 Instrumentation**

The instruments used for data collection were a developed questionnaire consisting of 35 items and structured around knowledge concerning

pressure injury prevention and treatment. The developed questionnaire consisting of three subscales and 35 items were answered with yes or no. The subscales were demographic data, pressure injury prevention and pressure injury treatment. There were 4 questions on demographic data, 23 questions on pressure injury prevention and 8 questions on pressure injury treatment. Knowledge score of participants below 50% was categorized as low knowledge level, knowledge score of participants between 50% to 70% was categorized as moderate knowledge level and knowledge score of participants above 70% was categorized as high knowledge level.

A developed checklist for collecting data from patients' record on nurses' practice concerning prevention and treatment of pressure injury was also used. It measured nurses' practice concerning pressure injury prevention and treatment through 15 items. The checklist consisted of two subscales and 15 items. The subscales were pressure injury prevention and pressure injury treatment. There were 11 items on pressure injury prevention and 4 items on pressure injury treatment. Practice score of participants below 50% was categorized as low practice level, practice score of participants between 50% to 70% was categorized as moderate practice level and practice score of participants above 70% was categorized as high practice level.

A developed training programme implemented based on feedback obtained from pre-intervention knowledge and practice score with learning modules produced for the training of nurses on pressure injury prevention and treatment. The training programme had two modules of learning and each module was completed on a day during the working days of each week within 1 hour.

The research instruments were presented to a panel of experts in the field of study who ascertained the content and face validity of the instruments. Reliability of the questionnaire was determined using split-half method and Cronbach's alpha reliability coefficient was 0.8. The training modules and checklist were also pre-tested and found suitable for the study.

### **2.5 Data Collection Procedure**

The procedure for data collection involved three phases:

**Phase 1:** It involved meeting with the recruited participants in the experimental group as well as control group separately where information about the purpose, course and potential benefits of the study was discussed. Consent was obtained from the participants in both groups after which they were asked to complete a developed and structured questionnaire. Internet access, interaction and reference materials were not allowed during data collection to avoid external assistance in answering the questions. The researcher stayed with the participants throughout the period of completing the questionnaire and completed questionnaires were checked thoroughly to ensure it was properly filled before retrieval from the participants. Developed checklist was utilized to collect information from the record file of admitted patients in the medical and surgical unit of the two teaching hospitals at the time of data collection. Data on practice concerning pressure injury prevention and treatment among nurses in the experimental and control group were collected.

**Phase 2:** Participants in the experimental group were exposed to two days training programme on pressure injury prevention and treatment during the month of February, 2017 while participants in the control group were exposed to training programme on hygiene and hand washing organized by the institution during the month of February, 2017. Each module was completed one day during the working days of the week within 1 hour.

**Phase 3:** A post-test was conducted on the experimental and control group two week post-intervention using the same instruments used during the pre-test. Data on nurses' practice concerning pressure injury prevention and treatment in the experimental and control group was also collected two weeks post-intervention using the developed checklist to collect information from the patients' file.

## 2.6 Method of Data Analysis

Data gathered from participants were processed using statistical package for social science (SPSS), version 21. Frequency table was constructed and data were expressed on it. Two research questions were answered using descriptive statistics of mean and standard deviation. Two hypotheses were tested using inferential statistics of student t-test at 0.05 level of significance.

## 2.7 Ethical Consideration

Ethical clearance was obtained from the Babcock University Health Research Ethics Committee (BUHREC) with clearance number BUHREC562/16. Permission was also obtained from the management of Olabisi Onabanjo University Teaching Hospital and Babcock University Teaching Hospital before the study was conducted. Participants were adequately informed about the study and consent was obtained before data was collected. Information obtained from the participants was kept confidential and the right to withdraw from the study at any point by participants was respected. No harm was suffered by the participants during the research study.

## 3. RESULTS PRESENTATION

Majority (40%) of control group participants and 50% of experimental group participants were between age 30-39 years; majority (75%) of control group participants and 85% of experimental group participants were females; majority (85%) of control group participants and 65% of experimental group participants were bachelor of nursing science degree holders; majority (50%) of control group participants and (65%) of experimental group participants had between 10-19 years of experience. Mean age of participants was 39.5 and standard deviation was 12.9.

Table 2 describes participants' knowledge category regarding pressure injury prevention and treatment. Result shows that in the control group, majority 15(75) had moderate pre-intervention knowledge regarding pressure injury prevention while in the experimental group, majority 16(80) had pre-intervention knowledge regarding pressure injury prevention. In the control group, majority 14(70) had moderate pre-intervention knowledge regarding pressure injury treatment while in the experimental group, majority 16(80) had moderate pre-intervention knowledge regarding pressure injury treatment. In the control group, majority 17(85) had moderate pre-intervention knowledge regarding pressure injury prevention and treatment while in the experimental group, majority 15(75) had moderate pre-intervention knowledge regarding pressure injury prevention and treatment.

In the control group, majority 16(80) had moderate post-intervention knowledge regarding

pressure injury prevention while in the experimental group, majority 16(80) had high post-intervention knowledge regarding pressure injury prevention. In the control group, majority 14(70) had moderate post-intervention knowledge regarding pressure injury treatment while in the experimental group, majority 16(80) had high post-intervention knowledge regarding

pressure injury treatment. In the control group, majority 16(80) had moderate post-intervention knowledge regarding pressure injury prevention and treatment while in the experimental group, majority 16(80) had high post-intervention knowledge regarding pressure injury prevention and treatment.

**Table 1. Frequency and percentage distribution of participants**

Demographic variables	Nurses n = 40	Control group frequency (%)	Experimental group frequency (%)	Mean age (Standard deviation)
Age range	20-29 years	5(25)	3(15)	39.5 (12.9)
	30-39 years	8(40)	10(50)	
	40-49 years	6(30)	6(30)	
	50-59 years	1(5)	1(5)	
Gender	Male	5(25)	3(15)	
	Female	15(75)	17(85)	
Professional qualification	RN and RM	3(15)	9(45)	
	BNSc	17(85)	11(55)	
Years of experience	Below 10 years	6(30)	3(15)	
	10-19 years	10(50)	13(65)	
	20-29 years	4(20)	3(15)	
	30-39 years	-	1(5)	

**Table 2. Participants' knowledge category regarding pressure injury prevention and treatment**

Pre-intervention knowledge category regarding pressure injury f (%)									
Group	Prevention			Treatment			Prevention and treatment		
	Low	Mode rate	High	Low	Mode rate	High	Low	Mode rate	High
Control group	2(10)	15(75)	3(15)	1(5)	14(70)	5(25)	2(10)	17(85)	1(5)
Experimental group	3(15)	16(80)	1(5)	2(10)	16(80)	2(10)	2(10)	15(75)	3(15)
Post-intervention knowledge category regarding pressure injury f (%)									
Group	Prevention			Treatment			Prevention and treatment		
	Low	Mode rate	High	Low	Mode rate	High	Low	Mode rate	High
Control group	1(5)	16(80)	3(15)	1(5)	14(70)	5(25)	2(10)	16(80)	2(10)
Experimental group	2(10)	2(10)	16(80)	1(5)	3(15)	16(80)	1(5)	3(15)	16(80)

**Table 3. Mean and standard deviation of participants knowledge concerning pressure injury prevention and treatment**

Group	Maximum point on scale	Pre-intervention mean	Pre-intervention standard deviation	Post-intervention mean	Post-intervention standard deviation
Control group	31	0.621	0.058	0.637	0.068
Experimental group	31	0.652	0.046	0.831	0.061

Table 3 reveals the maximum point on scale, mean and standard deviation of participants' scores on the developed questionnaire pre and post-intervention. The pre-intervention mean knowledge score of participants in the control group was 0.621 and the standard deviation was 0.058 while the pre-intervention mean knowledge score of participants in the experimental group was 0.652 and the standard deviation was 0.046. The post-intervention mean knowledge score of participants in the control group was 0.637 and the standard deviation was 0.068 while the post-intervention mean knowledge score of participants in the experimental group was 0.831 and the standard deviation was 0.061.

Table 4 describes participants' practice category regarding pressure injury prevention and treatment. Result shows that in the control group, majority 16(80) participants had low pre-intervention practice regarding pressure injury prevention while in the experimental group, majority 16(80) participants had low pre-intervention practice regarding pressure injury prevention. In the control group, majority 15(75) participants had low pre-intervention practice regarding pressure injury treatment while in the

experimental group, majority 16(80) participants had low pre-intervention practice regarding pressure injury treatment. In the control group, majority 16(80) participants had low pre-intervention practice regarding pressure injury prevention and treatment while in the experimental group, majority 14(70) participants had low pre-intervention practice regarding pressure injury prevention and treatment.

In the control group, majority 14(70) participants had low post-intervention practice regarding pressure injury prevention while in the experimental group, majority 14(70) had high post-intervention practice regarding pressure injury prevention. In the control group, majority 14(70) participants had low post-intervention practice regarding pressure injury treatment while in the experimental group, majority 16(80) had high post-intervention practice regarding pressure injury treatment. In the control group, majority 14(70) participants had low post-intervention practice regarding pressure injury prevention and treatment while in the experimental group, majority 15(75) had high post-intervention practice regarding pressure injury prevention and treatment.

**Table 4. Participants' practice category regarding pressure injury prevention and treatment**

Practice category regarding pressure injury pre-intervention f (%)									
Group	Prevention			Treatment			Prevention and treatment		
	Low	Mode rate	High	Low	Mode rate	High	Low	Mode Rate	High
Control group	16(80)	2(10)	2(10)	15(75)	3(15)	2(10)	16(80)	2(10)	2(10)
Experimental group	16(80)	1(5)	3(15)	16(80)	2(10)	2(10)	14(70)	4(20)	2(10)

  

Practice category regarding pressure injury post-intervention f (%)									
Group	Prevention			Treatment			Prevention and treatment		
	Low	Mode rate	High	Low	Mode rate	High	Low	Mode rate	High
Control group	14(70)	4(20)	2(10)	14(70)	1(5)	5(25)	14(70)	3(15)	3(15)
Experimental group	2(10)	4(20)	14(70)	1(5)	3(15)	16(80)	1(5)	4(20)	15(75)

**Table 5. Pre-intervention mean and standard deviation of participants practice concerning pressure injury prevention and treatment**

Group	Maximum point on scale	Pre-intervention mean	Standard deviation	Post-intervention mean	Standard deviation
Control group	15	0.407	0.053	0.437	0.063
Experimental group	15	0.407	0.043	0.800	0.065

**Table 6. Post-intervention knowledge of participants concerning pressure injury prevention and treatment among nurses**

Group	Max point on scale	Pre-intervention gain		Post-intervention		Mean gain	t-value	P-value
		Mean	Standard deviation	Mean	Standard deviation			
Control group	31	0.621	0.058	0.637	0.068	0.016	41.827	.000*
Experimental group	31	0.652	0.046	0.831	0.061	0.179		

**Table 7. Post-intervention practice of participants concerning pressure injury prevention and treatment among nurses**

Group	Max point on scale	Pre-intervention gain		Post-intervention		Mean gain	t-value	p-value
		Mean	Standard deviation	Mean	Standard deviation			
Control group	15	0.407	0.053	0.437	0.063	0.03	20.106	.000*
Experimental group	15	0.407	0.043	0.800	0.065	0.393		

Table 5 reveals the maximum point on scale, mean and standard deviation of participants' scores on the developed checklist. The pre-intervention mean practice score of participants in the control group was 0.407 and the standard deviation was 0.053 while the pre-intervention mean practice score of participants in the experimental group was 0.407 and the standard deviation was 0.043. The post-intervention mean practice score of participants in the control group was 0.437 and the standard deviation was 0.063 while the post-intervention mean practice score of participants in the experimental group was 0.800 and the standard deviation was 0.065.

Table 6 reveals that in the control group, the post-intervention mean knowledge score was 0.637 and the standard deviation was 0.068 while in the experimental group, the post-intervention mean knowledge score was 0.831 and the standard deviation was 0.061. The mean knowledge gain for the control group was 0.016 while the experimental group was 0.179. Result shows that there is a significant difference in post-intervention mean knowledge score among nurses in the experimental and control group. There is a significant difference in effect of a nurse-led training programme on knowledge concerning pressure injury prevention and treatment among nurses in the experimental and control group ( $P = .000$ ).

Table 7 shows that in the control group, the post-intervention mean practice score was 0.437 and the standard deviation was 0.063 while in the experimental group, the post-intervention mean practice score was 0.800 and the standard deviation was 0.065. The mean practice gain for the control group was 0.03 while the experimental group was 0.393. Result reveals that there is significant difference in post-intervention mean practice score among nurses in the experimental and control group. There is a significant difference in effect of a nurse-led training programme on practice concerning pressure injury prevention and treatment among nurses in the experimental and control group ( $P = .000$ ).

#### 4. DISCUSSION OF FINDINGS

There were more participants between 30-39 years in the medical and surgical unit during data collection. This finding disagrees with a previous quasi experimental study in which there were more participants between 20-29 years during data collection [12]. There were more females in the medical and surgical unit during data collection which is due to the dominance of females in nursing profession. This finding supports a previous quasi experimental study in which there were more female participants during data collection [12]. There were more bachelor of nursing science degree holders in the medical

and surgical unit during data collection. This finding supports previous quasi experimental study in which result showed more bachelor of nursing science degree holders during data collection [12]. There were more nurses with years of experience between 10-19 years in the medical and surgical unit during data collection. This finding agrees with a previous quasi experimental study in which there were more nurses with years of experience between 10-19 year during data collection [12].

Result reveals that pre-intervention, there was no difference in pre-intervention mean knowledge regarding pressure injury prevention and treatment among nurses in the experimental and control group as judged from pre-intervention mean knowledge scores of the experimental and control group. Post-intervention, there was a difference in mean knowledge regarding pressure injury prevention and treatment in the experimental group when compared with control group. This is due to the level of exposure to training programmes on pressure injury prevention and treatment among nurses in the experimental and control group. This finding supports a previous quasi experimental study in which result also showed difference in experimental group post-intervention mean knowledge score when compared with control group [12].

Result reveals that pre-intervention, there was no difference in practice concerning pressure injury prevention and treatment among nurses in the experimental and control group as judged from pre-intervention mean practice scores of the experimental and control group. Post-intervention, there was a difference in mean practice regarding pressure injury prevention and treatment in the experimental group when compared with control group. This is due to the level of exposure to training programmes on pressure injury prevention and treatment among nurses in the experimental and control group. This finding supports a previous quasi experimental study in which result also showed difference in experimental group post-intervention mean practice score when compared with control group [13].

Result shows that in the experimental group, knowledge concerning pressure injury prevention and treatment was improved by the training programme judging from the increase in post intervention mean knowledge score when compared with the pre-intervention mean

knowledge score. Student t-test was further used to show that there is a significant difference in effect of a nurse-led training programme on knowledge concerning pressure injury prevention and treatment among nurses in the experimental and control group ( $P = 0.000$ ). The finding reveals that prior to the training programme, there was no difference in knowledge concerning pressure injury prevention and treatment among nurses in the two groups as judged from pre-intervention mean knowledge scores. Two weeks post-intervention, the training programme was found to be effective in allowing participants in the experimental group have higher mean knowledge score post-intervention compared with pre-intervention. The finding supports previous study in which interactive lecture was used to increase mean knowledge score concerning pressure injury prevention and treatment among nurses which also supported the use of training programme to improve knowledge concerning pressure injury prevention and treatment among nurses [12].

Result shows that in the experimental group, practice concerning pressure injury prevention and treatment among nurses was improved by the training programme judging from the increase in post-intervention mean practice score when compared with the pre-intervention mean practice score. Result showed that there is significant difference in effect of a nurse-led training programme on practice concerning pressure injury prevention and treatment among nurses in the experimental and control group ( $P = 0.000$ ). The finding of this investigation revealed that prior to the training programme, there was no difference in practice concerning pressure injury prevention and treatment among nurses in two groups as judged from pre-intervention mean practice scores. Two weeks post-intervention, the training programme was found to be effective in allowing participants in the experimental group have higher mean practice score post-intervention compared with pre-intervention. The finding supports previous quasi-experimental study in which lecture method was used to increase mean practice score concerning pressure injury prevention and treatment among nurses which also supported the use of training programme to improve practice concerning pressure injury prevention and treatment among nurses [13].

## 5. SUMMARY

The effect of a nurse-led training programme on pressure injury prevention and treatment among

nurses in two teaching hospitals in Ogun State was the focus of this study. Prior to the training program, majority of participants in the experimental and control group had moderate knowledge level and low practice level concerning pressure injury prevention and treatment. The nurse-led training programme was effective in improving knowledge and practice concerning pressure injury prevention and treatment among nurses as participants in the experimental group showed significant improvement in knowledge and practice when compared with the control group.

## 6. CONCLUSION

Based on findings of this study, majority of participants in the experimental and control group had moderate knowledge level and low practice level. Training programme on pressure injury prevention and treatment improves knowledge and practice concerning pressure injury prevention and treatment among nurses as this study achieved a difference in post-intervention mean knowledge and practice score concerning pressure injury prevention and treatment between the control and experimental group. The study also achieved a significant difference in post-intervention knowledge and practice concerning pressure injury prevention and treatment between the control and experimental group. Hence, the nurse-led training programme has significantly improved knowledge and practice concerning pressure injury prevention and treatment among nurses.

## 7. RECOMMENDATIONS

Based on findings of the study, the following recommendations are made:

- Hospitals should regularly expose nurses to training programmes on pressure injury prevention and treatment to raise knowledge and practice concerning pressure injury prevention and treatment among nurses which are necessary to improve quality of nursing care.
- Hospitals should regularly review their protocols and policies on pressure injury prevention and treatment to ensure latest approaches is being implemented by nurses.
- Nursing curriculum in schools should be revised to include contents on prevention and treatment of pressure injury which is

necessary to improve knowledge and practice concerning pressure injury prevention and treatment among nurses.

- Private and government owned hospitals should organize refresher training programmes for nurses concerning pressure injury prevention and treatment which is necessary to improve knowledge and practice concerning pressure injury prevention and treatment among nurses.

## 8. LIMITATION OF THE STUDY

The study was limited by closeness in the distance between the experimental and control group settings. The study was also limited by lack of evaluation of the experimental group two months after the training programme has been implemented.

## CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

## ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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