KNOWLEDGE ATTITUDE AND PRACTICE OF PREGNANT WOMEN ATTENDING A HEALTH FACILITY REGARDING THE COVID -19 PANDEMIC: PRE AND POST-VACCINATION

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ABSTRACT

The world witnessed the introduction of the COVID -19 virus in December 2019. This caused a pandemic for the next two to three years causing 7,67,984,989 deaths worldwide. A hospital based cross sectional descriptive study conducted in the Obstetrics and Gynecology department of Nepal Medical College Teaching Hospital, which is located in a suburban area of Kathmandu. The objective of the study was to assess the knowledge, attitude and practice of the pregnant women regarding the COVID pandemic pre and post-vaccination and its correlation with socio-demographic factors like age and educational level. A total of 418 women participated in the study. In each phase there were 209 women. In the pre-vaccination phase, 8.1% women had good knowledge, 37.8% had positive attitude, and 37.3% good practice. In the post-vaccination phase, 44.5% had good knowledge, 65.5% had positive attitude, and 84.7% had good practices.

KEYWORDS

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DOI: https://doi.org/10.3126/nmcj.v25i4.60925

INTRODUCTION

Pneumonia of unknown cause detected in Wuhan, China was first reported to the WHO Country Office in China on 31st December 2019. A novel corona virus was eventually identified. The first recorded case of Corona virus outside of China was in Thailand on 13th January 2020. WHO declared 'this new disease' as a Public Health Emergency of International Concern (PHEIC) on January 30th 2020. On 11th February 2020, WHO announced a name for the new corona virus disease: COVID-19. It was declared a pandemic on 11th March 2020. Since detection, the corona virus has been a scare to the entire world.[1,2,3]

The genetic sequence of the virus was first published on 11th January 2020.[4] The initial symptoms identified by CDC were fever, cough, shortness of breath, chills, muscle pain, headache, sore throat, and new loss of taste or smell. From June 30th 2020, the CDC added three new symptoms, congestion or runny nose, nausea and diarrhea.[5] The number of days to be in quarantine was initially 14 days and it went down to 5 days till the third wave.

The first case in Nepal presented to the hospital on 13th January and the RT PCR report was confirmed positive on 23rd January 2020.[6,7] Two months later, i.e. on 24 March 2020, the Government imposed a complete 'lock-down' of the country including business closures and restrictions on movement within the country and flight access in and out of the country. The health facilities catered to only emergency cases. The first death due to the virus was reported in a postpartum lady on 14th of May 2020. This gave a scare to the obstetric fraternity, and bound us to think of ways to minimize the risk of it's transfer. A need to assess the level of knowledge, the attitude and practice among the pregnant women was the need of the hour.

Nepal was hit badly by the second wave which was due to the Delta variant. With the effort of multinational pharmaceutical agencies, together with the support of their country's government, the vaccine development reached human clinical trial on 16th March 2020.[4] In Nepal, the vaccination started from the 27th of January 2021 with COVISHIELD being imported from India.

MATERIALS AND METHODS

A hospital based cross-sectional descriptive study conducted in the Obstetrics and Gynaecology department of Nepal Medical College Teaching Hospital, which is located in a suburban area of Kathmandu. The Obstetrics and Gynaecology Department in the hospital provides the free delivery services sponsored by the government of Nepal. Approval from the Institutional Review Committee of the college was taken prior to conducting the study.

The lockdown imposed by the government was eased from the 15th of June 2020 and we started getting women in the OPD. The first part of the study was conducted from the 1st of July till the 30th of September 2020. The KAP towards COVID-19 was assessed nearly a month after the lock-down measures were eased, which also correlated with the rapid rise period of the outbreak. The second part of the study was done from the 1st of March 2022 till the 31st of May 2022, which coincided with the third wave. The sample size was estimated to be 196 for each part of the study (total minimum sample size is 392), anticipating that 50.0% of the study participants have good KAP with a 5.0% level of significance, 7.0% absolute error margin, and a 95.0% confidence interval.

All pregnant women attending the antenatal care clinic during the study period were considered for the study. An informed consent was taken. Women <16 weeks period of gestation and those refusing to give consent were excluded from the study. The objective of the study was to assess the knowledge, attitude and practice of the pregnant women regarding the COVID pandemic pre and post-vaccination and to correlate the level of knowledge, the attitude and the practice with socio-demographic factors like age and educational level. A questionnaire was developed by the investigators after studying the available details of the disease. The principal investigator interviewed the women in Nepali language. If she was unable to understand Nepali, somebody understanding the language was requested to translate. The women were asked to wear a mask during the interview and the interviewer also wore a mask for personal protection. A distance of at least one meter was maintained during the interview.

The questionnaire composed of 4 sections. It was pretested by interviewing 10 in-patients in antenatal ward. Changes in the questionnaire were made accordingly. The questionnaire in the second phase had the same number of questions in each part as in the first phase, but a few questions were modified and questions about the vaccine was also added. Section I of questionnaire consisted of 10 items which were designed to elicit the socio-demographic data. Section II consisted of 13 questions, which were used to measure the level of knowledge of

pregnant women towards COVID. There were 5 questions related to COVID in pregnancy. A total score of 27 was the maximum. One point was given to each correct response and the total score was calculated. This was represented in the percentage form and those women having a knowledge score of more than 75.0% were considered having good knowledge, those having a score between 50.0 to 75.0% were considered having average knowledge and those having a score below 50.0% were considered to have poor knowledge. Section III consisted of 7 questions related to the attitude of the women. Each of the question answered correctly was scored one point, total score was calculated. This score was converted into the percentage form and was categorized as negative attitude, neutral attitude and positive attitude according to the percentage score. Section IV consisted of 10 items, which were used to measure the practice of the women. Statements were rated on a 4-point Likert scale (1=not at all to 4=very much so). The total practice score was calculated based on the Likert scale score questionnaire. This was again converted to the percentage form and the practice was quantified as bad, average and good practice.

All data collected was entered into the master chart in MS Excel and statistical analysis was done on SPSS-16. Descriptive statistics were calculated to describe the characteristics of the sample and cross-tabulation for the distribution of knowledge, attitude and practices of the participants towards COVID-19. To examine the association of socio demographic factors of the participants with their practices, chi square test was applied and variables with p-value less 0.05 were considered as statistically significant.

RESULTS

A total of 418 women participated in the study. In each phase there were 209 women.

Pre-vaccination: The maximum number of women (47.8%) belonged to the age group of 26-30 years. There were sixteen women (7.6%) who were less than or equal to 19 years of age and no women in the elderly gravida group. All women included in the study were married. Majority of the women (50.8%) had primary education. Thirty nine (18.7%) of the women were illiterate. Most of the women (78.5%) were home makers. There were women with different professions including teacher,

Table 1: Socio-demographic characterstics of women			
Characteristics	**Category**	**Phase 1 n (%)**	**Phase 2 n (%)**
Age	<19	16 (7.6)	21 (10.0)
	20 – 25	47 (22.5)	82 (39.2)
	26 – 30	100 (47.8)	94 (45.0)
	31 – 35	46 (22.0)	12 (5.7)
	> 35	0	0
	Mean±SD = 29.47±5.49		
Marital status	Married	209 (100.0)	209 (100.0)
Educational status	Illiterate	39 (18.7)	43 (20.6)
	Primary	106 (50.8)	105 (50.2)
	High school	46 (22.0)	48 (23)
	Gradutes	18 (8.6)	13 (6.2)
Occupation	Homemaker	164 (78.5)	160 (76.6)
	Student	3 (1.4)	4 (1.9)
	Teacher	15 (7.2)	8 (3.8)
	Makeup artist	5 (2.4)	15 (7.2)
	Others	22 (10.5)	22 (10.5)
Income	<20000	38 (18.2)	32 (15.3)
	20001 - 39999	103 (49.3)	141 (67.5)
	>40000	68 (32.5)	36 (17.2)
Type of house	Own house	48 (23.0)	42 (20.1)
	Rented single room (shared bathroom)	117 (56.0)	35 (16.7)
	Rented apartment (private bathroom)	44 (21.0)	132 (63.2)
Family member with COVID	No	209 (100.0)	0 (0.0)
	Yes	0 (0.0)	209 (100.0)
Parity	Nulliparous	102 (48.8)	107 (51.2)
	Multipara	107 (51.2)	102 (48.8)

Table 2: Knowledge, attitude and practice scores of women			
Variables	**Category**	**Pre-vaccination n (%)**	**Post-vaccination n (%)**
Knowledge	Poor (<50.0%)	4 (1.9)	3 (1.4)
	Average (50.0 to 75.0%)	188 (89.9)	113(54.0)
	Good (>75.0%)	17 (8.1)	93(44.5)
Attitude	Negative (<50.0%)	12 (5.7)	13 (6.2)
	Neutral (50.0 to 75.0%	118 (56.4)	59 (28.2)
	Positive (>75.0%)	79 (37.8)	137 (65.5)
Practice	Bad (<50.0%)	00 (0.0)	0 (0.0)
	Sufficient (50.0 to 75.0%)	131 (62.7)	32 (15.3)
	Good (>75.0%)	78 (37.3)	177 (84.7)

Table 3: Questions assessing practice of women pre-vaccination				
Questions	**Not at all**	**Somewhat**	**Moderately so**	**Very much so**
Have you decreased your social activities?	18(8.6%)	6(2.9%)	31 (14.8%)	154 (73.7%)
Have you decreased your intimate contact with your partner?	61 (29.2%)	65 (31.1%)	63(30.1%)	20 (9.6%)
Have you decreased your social contact with your friends?	6 (2.9%)	9(4.3%)	94(45%)	100(47.8%)
Have you decreased your follow up at the hospital?	0	0	82(39.2%)	127 (60.8%)
Are you following the lockdown rules?	174 (83.3%)	11 (5.3%)	10 (4.8%)	14 (6.7%)
Are you practicing hand washing by the clock?	22 (10.5%)	24 (11.5%)	50 (23.9%)	113 (54.1%)
Do you wear a mask?	0	7 (3.3%)	6 (2.9%)	196 (93.8%)
Have you increased your personal hygiene?	0	0	114 (54.5%)	95 (45.5%)
Do you keep your environment clean?	146 (69.9%)	0	17 (8.1%)	46 (22%)
Do you carry a sanitizer while going outside?	19 (9.1%)	64 (30.6%)	70 (33.5%)	56 (26.8%)

housemaid, beauticians and students as shown in Table 1. The annual family income ranged between Nepali Rupees 240,000 to 4,80,000 in majority of the women (49.3%). Most of the women (56.0%) lived in single rented rooms which had a shared bathroom. No participant reported that any family members had been diagnosed with COVID-19 infection. The proportion of primipara and multipara was more or less equal (48.8 % vs 51.2%).

A total of 17 (8.1%) women had good knowledge regarding the disease and the virus. Only four women (1.9%) had poor knowledge. Majority of them (89.9%) had average knowledge. Similarly the mean attitude score was calculated to be 71.91% (at a standard deviation of 13.09) and a majority of the women (56.4%) had a neutral attitude towards the disease. Seventy nine women (37.8%) had a positive attitude towards the disease. The score for practice was

calculated to be 73.01 (SD 7.84). Seventy eight women (37.3%) had good practice, while the rest 131 of them had average practice. None of the women had bad practices (Table 2).

The level of knowledge was significantly associated with the level of education of the women, with graduates having a higher level of knowledge (p<0.01) (Table 5). The attitude score was significantly associated with the level of education of the women, with graduates having a better attitude towards the disease (p< 0.01) (Table 5). The practice of the women was statistically significant to the level of knowledge and the family income (p<0.01) (Table 5 and 6). There were no other significant associations of the demographics with the knowledge, attitude and practice of the women.

Post-vaccination: The maximum women (45.0%) belonged to the age group of 26-30 years. There

Table 4: Questions accessing the practise of women post-vaccination				
Questions	Not at all	Somewhat	Moderately so	Very much so
Have you decreased your social activities?	0	1 (0.5%)	92 (44.0%)	112 (55.5%)
Have you decreased your intimate contact with your partner?	0	0 (0.0%)	129 (61.7%)	80 (38.3%)
Have you decreased your social contact with your friends?	0	98 (46.9%)	98 (46.9%)	13 (6.2%)
Have you decreased your follow up at the hospital?	209 (100%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Did you take the vaccine?	11 (5.3%)	0 (0.0%)	0 (0.0%)	198 (94.7%)
Are you practicing hand washing by the clock?	0	0 (0.0%)	0 (0.0%)	209 (100.0%)
Do you wear a mask?	0	0 (0.0%)	0 (0.0%)	209 (100.0%)
Have you increased your personal hygiene?	0	39 (18.7%)	71 (34.0%)	99(47.4%)
Do you keep your environment clean?	0	43 (20.6%)	132 (63.2%)	34 (16.3%)
Do you carry a sanitizer while going outside?	5 (2.4%)	37 (17.6%)	146 (69.9%)	21 (10%)

Table 5: Association between women's KAP and education (Pre-vaccination)					
Parameters	Illiterate	Primary	High-school	Graduates	p-value
Knowledge Score	58.59+/-3.41	68.63+/-4.87	63.29+/-4.87	61.44+/-10.46	<0.001
Attitude Score	65.90+/-13.01	78.57+/-8.91	71.43+/-13.86	80.59+/-7.68	<0.001
Practice Score	69.90+/-4.12	77.55+/-8.49	75.97+/-11.89	74.74+/-9.06	<0.001

Table 6: Association between women's KAP and family income (Pre-vaccination)				
Parameters	Less than 240,000	240,000- 480,000	More than 480,000	p-value
Knowledge Score	60.71+/-8.01	61.65+/-6.74	68.30+/-1.26	0.018
Attitude Score	77.81+/-9.8	70.11+/-13.36	80.36+/-10.63	0.01
Practice Score	74.47+/-5.49	72.12+/-7.65	84.37+/-11.71	<0.01

Table 7: Association between women's KAP and education (Post-vaccination)					
Parameters	Illiterate n=19	Primary n=75	High-school n=102	Graduates n=13	p-value
Knowledge Score	55.26+/-5.10	64.67+/-7.44	76.15+/-7.02	90.11+/-2.58	<0.001
Attitude Score	55.6391+/-11.56	73.5238+/-14.23	85.01+/-4.66	67.03+/-10.73	<0.001
Practice Score	73.68+/-2.93	76.83+/-4.07	79.26+/-3.49	79.42+/-2.32	<0.001

were no women in the elderly age group. All women were married. Most of the women (50.2%) had primary level education. Most of the women (76.6%) were homemakers. There were a few students, teachers, make-up artists, and shopkeepers also. Majority of the women (67.5%) had an annual family income of 2,40,00 – 4,80,000 Nepali Rupees. Most of the women (63.2%) lived in rented apartments. Since the start of the pandemic, all of the women had at least a family member or they themselves infected with the virus (Table 1).

A total of 93 (44.5%) women had good knowledge regarding the disease and the virus. Majority (113; 54.0%) of them had average knowledge. Only three women (1.4%) had poor knowledge. Similarly the mean attitude score was calculated to be 77.1% (at a standard deviation of 13.58) and a majority of the women (137; 65.5%) had

Table 8: Association between women's KAP and family income (Post-vaccination)				
Parameters	Less than 240,000 n=32	240,000- 480,000 n=141	More than 480,000 n=36	p-value
Knowledge Score	55.47+/-5.21	73.20+/-8.57	76.19+/-11.06	<0.001
Attitude Score	54.91+/-10.95	81.96+/-8.48	77.78+/-12.52	<0.001
Practice Score	74.14+/-2.88	79.43+/-3.37	75.21+/-3.50	<0.001

a positive attitude towards the disease. The score for practice was calculated to be 77.9% (SD of 4). A hundred and seventy seven women (84.7%) had a good practice, while the rest 32 of them had average practice (Table 2).

The level of knowledge, the attitude and the practice was significantly associated with the level of education of the women (p<0.01) (Table 7). Similarly, the level of knowledge, attitude and practice was significantly associated with the annual family income of the women (p<0.01) (Table 8). There were no other statistically significant associations of the demographics with the knowledge, attitude and practice of the women.

DISCUSSION

Pre-vaccination:

Knowledge: In the first phase of the study, only eight percent of women had good knowledge, whereas 90% of women had average knowledge, which can be considered satisfactory. In the study done by Kamal *et al*[8] in Andhra Pradesh, India in pregnant women, 75.3% of women had adequate knowledge, which was slightly lower than in this study. Also Kaur *et al*[9] and Nwafor *et al*,[10] reported in their study in pregnant women, 68.5% and 60.9% had adequate knowledge respectively. Also, in another study done in Nepal, by Ashraf *et al*,[11] in the general population, there was a wide range in the correct answer of 60-98.7%. This could be a result of our government's efforts to educate the general population by all means possible, including mentioning the symptoms of COVID as a backtone on the phone. Our result is similar to the result recorded in the study done in China in the general population.[12] Similarly in another study done in Bangladesh, in the general population, 48.3% of the respondents had accurate knowledge as compared to 51.7% having inaccurate knowledge regarding COVID-19.[13]

All women knew that fever, dry cough, and nasal congestion were symptoms of the disease. Only 37.3% of women knew that loss of taste/ smell is also a symptom. Seventy one to ninety five percent of women were aware of other symptoms like myalgia/headache, sore throat, tiredness, and diarrhea. All women were aware that the virus spreads by coming in contact with droplets of saliva, infected fomites and shaking hands with infected people. More than half of the women (53.6%) thought the virus spreads by consuming meat. The government had created backtones which told the symptoms and the importance of personal precautionary methods of the disease, maybe that's why all of the women were aware of the personal precautionary methods. Similarly, all women knew the duration of stay for quarantine and the hand washing time. Majority (68.4%) of the women didn't know if a disinfectant is needed at home.

There were six questions specific to pregnancy and COVID. Fifty one percent (51.2%) of women thought that in pregnancy women are more susceptible to COVID. Most (63.0%) of them weren't sure if pregnancy could be continued after acquiring COVID. Majority (57.4%) of women thought COVID could be transferred perinatally, the rest weren't sure. All women knew that wearing N95 masks prevents transmission, none knew anything regarding the need for contraception after acquiring COVID, and all women thought breastfeeding should be avoided if the mother has COVID. This is in contrast to the study done by Yass *et al*,[14] where nearly half of the women reported having no idea or thought that breastfeeding is not safe during the outbreak.

The level of knowledge was significantly associated with the level of education of the women. In the Nigerian study done by Nwafor *et al*,[10] factors associated with inadequate knowledge were age >40 years, parity 5 or more, no formal education and rural residence.

Attitude: A positive attitude, was reported in 37.8% of women, which was lower than reported by Kamal *et al*,[8] Kaur *et al*[9] and Ferdous *et al*;[13] 73.9%, 86.0-96.0% and 62.3%, respectively. This difference could be because we had classified the attitude into three categories, positive,

negative and a neutral attitude, whereas the other studies had only two groups, without a neutral category.

All women's daily life was disturbed due to COVID. Amazingly, 140 (67.0%) of the women said they wouldn't get themselves tested if they felt they had the disease. This is in contrast to the response received in the study by Austrian *et al*[15] where, 71.0% respondents said they'd go to a clinic if they thought they had the symptoms.

Majority of the women (91.4%) believed they could get the disease. Except one woman, all believed that self protection was necessary for the protection of others. Nearly half (48.3%) of them believed hospital birth will be safer than home birth. Majority (68.9%) believed Nepal will overcome the disease. Sixty five percent approved of the lockdown imposed by the government. In the study done by Yassa *et al*,[14] eighty seven percent of women were willing to comply by the lockdown rules and 74.0% were taking proper preventive measures.

Practices: Maximum women (62.7%) had sufficient practices, thirty seven percent had good practices, there were no women with bad practices in the study.

The practice of the women was statistically significant to the level of knowledge and the family income. In the study done by Nwafor *et al*,[10] the determinants of poor practice were age 31-40 years, being married, parity 5 or more, residing in a rural area and having no formal education. The table number 3 shows the frequency of the various questions used to assess practice with their responses.

About 88.0% of women had reduced their social activity, which included various get-togethers and the baby shower ceremony which almost every community celebrated on regular days. Also nearly 40.0% of women reduced their intimate contact with their husbands in fear of acquiring the disease. All of the women reduced their follow up at the hospital. Nearly 87.6% of women weren't following the lockdown rules properly. The government had imposed strict restrictions, with specific timings fixed for shopping. Initially the police were seen punishing those loitering around on the streets. It was difficult for those living in a single room, so probably they would be roaming around to reduce their stress, since there were no other recreation facilities. On other pre-COVID days, we would get to see many men sitting in the local tea and coffee shops on the roadside chit chatting away. This was not seen anywhere in the COVID era, instead the roads were desolate.

Nearly 78% washed their hands after returning home from outdoor activities. Most of them (93.8%) always wore a mask, and 60% of them preferably carried a sanitizer with them while going outdoors. All women had increased their personal hygiene, which consisted of taking baths more frequently and changing into fresh clothes daily.

Post-vaccination:

Knowledge: The mean score of our study was 71% at SD of 10.92, which is comparable to the mean knowledge obtained in the study done in Qatar, where the mean was 5.31 out of 8 in total.[16]

In the study done in Pakistan in pregnant women at the same time as the second phase of our study, they reported that only 3.1% of the women had excellent knowledge, 20.7% had good knowledge and majority (75.9%) had poor knowledge,[17] which is in contrast to our study, where, majority of our women (54.0%) had average knowledge, followed by 44.5% of them having good knowledge.

All women knew that fever, dry cough, nasal congestion, myalgia/ headache, tiredness and loss of taste/smell were the symptoms of the disease. All women knew that the mode of transmission is droplets of saliva, fomites, hand shaking with infected person. All women were aware that wearing a mask, frequent hand washing and physical distancing are the protective measures. About 73.2% (153) of women still believed that meat consumption could be a cause of COVID infection. The duration of quarantine had been reduced to 5 days by the WHO, but only 36 women (17.1%) knew the correct answer, majority (24.3%) thought 10 days as the duration of quarantine. Majority (167; 79.5%) of the women did understand that there was no definitive treatment of the disease, maybe because all women had experienced at least one family member get the infection and heal.

In the pregnancy specific questions, majority (60.0%) women still thought the chances of acquiring the infection in pregnancy is increased. Fifty three percent of women said they would like to continue pregnancy even if they contracted the disease. Majority (114; 54.3%) of the women didn't know whether COVID could be transferred perinatally or not. Majority (86.2%) of women thought that COVID infected mothers couldn't breastfeed their babies. All women knew that wearing a mask reduces the transmission. Majority (61.2%) of women weren't sure whether contraception is needed after a COVID infection or not.

Attitude: In this study, 65.5% of our women had a positive attitude towards the disease, which is slightly lower than that recorded in the study done in Pakistan 88.1%

All women agreed that COVID had affected their daily life in someway or the other. Majority (165; 78.6%) of the women were stressed due to COVID. Eighty three percent believed they could get the disease. All believed self protection is important for the protection of others. Majority (84.0%) of them believed hospital birth will be safer than home birth. Majority (94.7%) believed vaccine is helpful in preventing the disease. All unanimously agreed that the government shouldn't impose a lockdown again if the cases increased.

Practices: The table shows the frequency of the various questions used to assess practice with their responses.

About 99.5% of women had reduced their social activity, which included various get-togethers and the baby shower ceremony which almost every community celebrated on regular days. All of women preferred to abstain from sexual contact with their husbands in fear of acquiring the disease. All of the women followed up at the hospital as advised by the doctors. Nearly 94.7% of women had taken the vaccine before being pregnant, which shows that the women included in the study believed in the vaccine.

All women wore masks while going outside, and washed their hands after returning home from outdoor activities. Women believed that these were the main two activities that would reduce transmission of the disease.

Eighty percent of them still preferably carried a sanitizer with them while going outdoors. This was because new strains of the virus kept coming and women were still scared about acquiring the disease. Most of the women (82.0%) had increased their personal hygiene, which consisted of taking baths more frequently and changing into fresh clothes daily.

In conclusion, there were more women with good knowledge (44.5% Vs 8.1%), positive attitude (65.5 Vs 37.8%), and good practice (84.7 Vs 37.3%) in the post-vaccination phase.

None of the women participating in the study had bad practices, both in the pre-vaccination and the post-vaccination period, which shows that pregnant women in the present study were cautious, and had adopted healthy practices.

Limitations: This study was done in a single centre, so it cannot give us an idea of the KAP of pregnant women in our country as a whole. A multicentric study, done in various hospitals, including outside Kathmandu valley would give us a better picture of the KAP of our pregnant women.

ACKNOWLEDGEMENT

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