TO ASSESS THE KNOWLEDGE AND PERCEPTIONS REGARDING NOVEL CORONAVIRUS (COVID-19) DURING THE FIRST SURGE AMONG HEALTHCARE WORKERS OF BANKE DISTRICT, NEPAL

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ABSTRACT

Background: Human Coronaviruses (HCoVs), a large family of single-stranded RNA viruses in humans causes mainly respiratory tract infections. The current outbreak of coronavirus disease 2019 has emerged as pandemic causing severe public health issue of international concern. This study aims to assess the knowledge and perception regarding novel coronavirus (COVID-19) during first wave of pandemic among healthcare workers working at various Health care institutions.

Method: This web-based cross-sectional study was conducted among 174 health care workers of Banke district, Nepal between May-July 2020 during first wave of COVID-19 pandemic using an online self-administered questionnaire. A 35-item self-administered survey instrument was developed using WHO course materials on emerging respiratory viruses, including COVID-19, and covered the domains of HCWs characteristics, knowledge, and perceptions of HCWs related to COVID-19. Descriptive statistics were reported as proportion and frequencies. Bivariate analysis was performed using chi-square test to assess the association of level of knowledge, and perception about COVID-19 with participants' characteristics. A p-value of less than 0.05 was considered statistically significant. All the statistical analysis was performed using IBM SPSS software, version 23.

Findings: Most of the participants (94.8%) had known about the virus from news (70.1%) and social media (68.4%). Among them only 36.2% participants had the opportunities to attend lectures, discussions, and training about the virus COVID-19. Overall, 55.7%, and 52.9% of the HCWs had adequate knowledge, and positive perception about COVID-19, respectively. Bivariate analysis showed no significant association of knowledge regarding COVID-19 among health care worker with participants characteristics whereas, the variables such as gender, occupation, working department showed significant association of perception regarding COVID-19 among health care worker.

Conclusion: This study revealed lower level of knowledge and positive perception regarding COVID-19 and infection control measures among HCWs. There is a need of adequate training to enhance the knowledge and perception about covid-19 and safety measures to the HCWs.

Key words: Novel Corona virus, COVID-19, Knowledge and Perception, Health care workers

INTRODUCTION

Human Coronaviruses (HCoVs), a large family of single-stranded RNA viruses in humans cause mainly respiratory tract infections[1, 2]. The current outbreak of coronavirus disease 2019 (COVID-19) in Wuhan City, China, in December 2019 has emerged as a global outbreak and significant public health issue causing severe respiratory illness and pneumonia-like infection in humans which was later declared as COVID-19 a public health emergency by the World Health Organization (WHO) on January 2020[3]. Neither an effective anti-viral nor a vaccine was available during first wave to treat this infection[4]. Astonishingly, devastating number of new cases were reported globally, emerging as a pandemic with more than a million confirmed cases and more than 85711 conformed deaths across 212 countries were reported till April 2020[5].

The spread of COVID-19 was reported by human-to-human through droplets, feco-oral, and direct contact, with an incubation period of 2-14 days[6]. Most people infected with the COVID-19 virus experience mild to moderate respiratory illness and recover without requiring special treatment. Older people and those with comorbidities like cardiovascular disease, diabetes, chronic respiratory disease, cancer and immunosuppressed are more likely to develop serious illness[7]. On another hand, Healthcare workers (HCWs) are the primary section in contact with patients and are an important source of exposure to the infected cases in the healthcare settings, thus, expected to be at a high risk of infections. Since non availability of antiviral treatment or vaccine applying the preventive measure to control COVID-19 infection is the utmost critical intervention. By the end of January, the WHO and CDC (Centers for Disease Control and Prevention) recommended use of PPE, mask and hand sanitization and also initiated several online training sessions and materials on COVID-19 for the prevention and control of COVID-19 for HCWs [8-10]. In several instances, misunderstandings of HCWs delayed controlling efforts to provide necessary treatment, implicate rapid spread of infection in hospitals, and also may put the patients' as well as healthcare worker lives at risk[10-11].

Given the higher infectivity of the disease, health care workers (HCWs) in contact with COVID-19 patients are expected to be at a high risk of infections. Therefore, use of personal protective equipment is crucial to reducing transmission. Gowns and gloves are recommended as a contact precaution, and surgical masks are recommended as a droplet precaution. However, these effective infection prevention and control practices depend on awareness and compliance among HCWs at all levels[12]. In this regard, the COVID-19 epidemic offers a unique opportunity to investigate the level of knowledge, and perceptions of HCWs during this global health crisis. Besides, we also explored the role of different information sources in shaping HCWs knowledge and perceptions on COVID-19 during this peak period. Poor understanding of the disease among healthcare workers (HCWs) may implicate in delayed treatment and the rapid spread of infection. This study aimed to investigate the knowledge and perceptions of HCWs about Novel Coronavirus (COVID-19) in Banke district, Nepal.

MATERIAL AND METHODS

Study design and settings: This web-based cross-sectional study was conducted to assess the knowledge and perception regarding novel coronavirus (COVID-19) among healthcare workers (Doctors, Nurses, and Lab-technicians) working at various Health care institutions of Banke district Nepal. The study was conducted between May-July, 2020.

Sampling design and sample: Non probability convenient sampling technique was used to collect data from healthcare worker. By using enumerative sampling method, total 174 Healthcare workers (Doctors, Nurses and Lab-technicians) were included in this study who were working in various department of Bheri Hospital Nepalgunj and Nepalgunj Medical College (Nepalgunj and Kohalpur).

Data collection tools and instruments: A 35-item self-administered survey instrument was developed using WHO course materials on Emerging respiratory viruses, including COVID-19, and covered the domains of HCWs characteristics, awareness, information sources, knowledge and perceptions related to COVID-19. The 35-item questionnaires were divided into three parts including; i) participant characteristics (6 items); ii) awareness of COVID-19 (18-items); and iii) perceptions toward COVID-19 (11 items).

Study variables and scoring: Participants characteristics included age, gender, religion, occupation, working department in hospital, and if they had heard about novel corona virus or not. Sufficient time (days) was given to respondents to read, comprehend, and answer all the questions. Knowledge on COVID-19 was explored using 18 questions. The questions consist of the general information about the natural history of COVID-19 including its mode of transmission, incubation period, symptoms, and its preventive measures, etc. The correct responses were coded as "1" and incorrect responses were coded as "0". The total score for knowledge was calculated as the sum of the responses for the 18 item questions, which yielded a total score ranging from 0-18. The higher score was indicative of a higher level of knowledge on COVID-19. Perception on COVID-19 was assessed using 11 items. The items consist of question relating to the respondent's perception about its fatality, probability of contracting COVID-19 infection, severity of the infection, etc. The options for the items were given as "yes", "no", and "don't know". The overall perception was classified as "positive perception" and "negative perception".

Statistical Analysis: The data collection through email was first entered into the Microsoft excel. Descriptive statistics were applied to report proportion and frequencies. Chi-square test was applied to investigate the association of level of knowledge, and perception about COVID-19 with participants' characteristics. A p-value of less than 0.05 was considered statistically significant. Statistical analysis was performed using IBM SPSS software, version 23.

Ethical Approval: Ethical approval was obtained from Ethical Review Board (ERB) of NHRC, Nepal (Ref. no.: 2470, date: May 20, 2020). Written informed consent was taken from participants in the study through mail. Participants were guaranteed of anonymity and confidentiality.

RESULTS

Table 1 shows frequency and percentage distribution of participants' characteristics. Most of the participants (94.8 %.) were known about the virus whereas only 9 (5.2%) were unknown. About 39% of the HCWs were working in ICU whereas only 15.5% HCWs were working in laboratory department. Only 36.2% of them had attended lectures, discussions and training about the virus whereas most of the respondents (63.8%) were still left to get the opportunities. Among them, 122 (70.1%) had heard about Novel Coronavirus from News media (70.1%) and 119 (68.4%) from social media.

Table 1: Frequency and Percentage showing socio-demographic details of healthcare workers.

S. No	Socio-demographic variables		N	%
		18-28	132	75.9
		29-38	28	16.1
1.1	Age (in years)	39-48	13	7.5
		49-59	1	0.6
1.2	Sex	Male	44	25.3
		Female	130	74.7
		Hindu	154	88.5
1.3	Religion	Islam	8	4.6
		Buddhist	6	3.4
		Christianity	6	3.4
		Doctor	32	18.4
1.4	Occupation	Nurse	110	63.2
		Lab technician	27	15.5
		H.A.	5	2.9
		Emergency	38	21.8
1.5	Department	Medical ward	42	24.1
		ICU	67	38.5
		Laboratory	27	15.5
1.6	Heard about Novel Corona virus (COVID-19)	Yes	165	94.8
		No	9	5.2
1.7	Attended lectures/discussions/training about Novel Corona virus (COVID-19)	Yes	63	36.2
		No	111	63.8
1.7.1	If yes (from 1.7)	Lecture	20	32.7
		Discussion	21	33.3
		Training	22	35
		News media	122	70.1
		Social media	119	68.4
1.8	Source of Knowledge about Novel corona virus	Gov, Websites	63	36.2
		Family/friends	55	31.6
		Training	21	12.1
		Formal class	18	10.3

Table 2 shows frequency and percentage distribution of Knowledge regarding Novel Corona virus (COVID-19) among healthcare workers. Majority of participant 92 (52.8%) answered being within approximately 6 feet (2 meters) of a patient with COVID-19 for a prolonged period of time and having direct contact with infectious secretion (sputum, serum, blood) is considered close contact. Majority of the participants (83.3%) answered hand hygiene actions that prevents transmission of the virus to the health-care worker are washing hands after touching a patient, immediately after exposure to body fluids, after exposure to immediate surroundings of the patient and before putting on and upon removal of personal protective equipment (PPE), including gloves. Healthcare workers in which majority of the participants

(94.3%) answered most effective method for prevention of COVID-19 infection in the healthcare setting is to avoid exposure (use standard precautions, contact precautions, and airborne precautions and eye protection when caring for patients with confirmed or possible COVID-19. Most of participant (87.4%) answered recommended infection prevention and control measure is to perform aerosol-generating procedures, including collection of diagnostic respiratory specimens, in an AIIR (airborne infection isolation room).

Table 2: Frequency and Percentage distribution of Knowledge regarding Novel Corona virus (COVID-19) among healthcare workers.

S. No	Knowledge questionnaire		N	%
2.1	The virus causing COVID-19 infection	a) Severe Acute Respiratory Syndrome Corona Virus (SARS)	9	5.2
		b) Severe Acute Respiratory Syndrome Corona Virus. (SARS.COV-2)	80	46.0
		c) 2019-ncov	20	11.5
		d) both b and c	58	33.3
		e) both a and c	7	4.0
2.2	First cases were reported from Wuhan, China	a) Yes	170	97.7
		b) No	4	2.3
2.3	COVID-19 is thought to be originated from	a) Mosquito	3	1.7
		b) Bat	121	69.5
		c) Pangolin	9	5.2
		d) Both b and c	41	23.6
2.4	The main mode of transmission of virus from person to person is via:	a) Respiratory droplet	143	82.2
		b) Spread from contact with contaminated surface or object	31	17.8
		c) Sexual transmission	0	0
		d) Blood Transfusion	0	0
2.5	The incubation period of COVID-19	a) 2-14 Days	164	94.25
		b) 4-8 days	1	0.58
		c) 2-16 Days	9	5.17
		d) 2-18 Days	0	0
2.6	What are the symptoms of COVID-19	a) Headache	1	0.6
		b) Fever	6	3.4
		c) Cough/Sore Throat	0	0
		d) Breathing difficulty	4	2.3
		e) All of the above	163	93.7
2.7	COVID-19 leads to pneumonia, respiratory failure and death	a) True	172	98.85
		b) False	2	1.15
2.8	Which of the following is considered as close contact?	a) Being within approximately 10 feet (3meters) of a patient with COVID-19 for a prolonged period of time	22	12.7
		b) Being within approximately 6 feet (2 meters) of a patient with COVID-19 for a prolonged period of time	33	19

		c) Having direct contact with infectious secretion (sputum, serum, blood) from a patient with COVID-19	27	15.5
		d) Both option (b) and (c)	92	52.8
2.9	Which of the following hand hygiene actions prevents transmission of the virus to the health-care worker?	a) After touching a patient	2	1.1
		b) Immediately after exposure to body fluids	4	2.3
		c) After exposure to immediate surroundings. of the patient	4	2.3
		d) Before putting on and upon removal of personal protective equipment (PPE), including gloves.	19	10.9
		e) All of the above	145	83.3
2.10	Preferred method of hand hygiene for visibly soiled hands is:	a) Hand rub with soap and water for at least 10 seconds	19	10.9
		b) Hand rub with soap and water for at least 20 seconds	93	53.4
		c) Use of alcohol-based hand sanitizer with at least 60% alcohol	62	35.6
2.11	Use of a face mask is not essential in which or the following groups?	a) People who are well, to protect themselves from COVID-19 infection	145	83.3
		b) Being in close contact to a person suspected of or known to have COVID-19 infections	19	10.9
		c) Healthcare professionals	10	5.7
2.12	Which of the following is the most effective method for prevention of COVID-19 infection in the healthcare setting?	a) Avoid exposure (use standard precautions, contact precautions, and airborne precautions and eye protection when caring for patients with confirmed or possible COVID-19	164	94.3
		b) Vaccination	10	5.7
2.13	What personal protective equipment (PPE) should be worn by individuals transporting patients who are confirmed with or under investigation for COVID-19 within a healthcare facility?	a) Glove	0	0
		b) Gown	0	0
		c) Eye protection	3	1.7
		d) Respirators - N95 mask	3	1.7
		e) All of the above	168	96.6
2.14	What PPE should be worn by HCP providing care to asymptomatic patients with a history of exposure to COVID-19 who are being evaluated for a non-infectious complaint (e.g., hypertension or hyperglycemia)?	a) Glove	4	2.3
		b) Gown	10	5.7
		c) Eye protection	8	4.6
		d) Respirators - N95 mask	5	2.9
		e) All of the above	147	84.5
2.15	Which of the following is recommended for isolation of a	a) Airborne infection isolation room (air) with exhaust	127	73.0

	patient with confirmed COVID-19 and those under investigation for COVID-19?	b) Airborne infection isolation room (air) without exhaust	47	27.0
2.16	Which of the following are recommended infection control measures upon arrival of a patient with suspected COVID-19 infection?	a) Rapid triage of symptomatic patients.	8	4.6
		b) Implement respiratory hygiene and cough etiquette (i.e., placing a facemask over the patient's nose and mouth if that has not already been done	4	2.3
		c) Have a separate, well-ventilated space that allows waiting symptomatic patients to be separated by 6 or more feet	11	6.3
		d) All of above	151	86.8
2.17	Clinical management includes prompt implementation of recommended infection prevention and control measures and supportive management of complications. No specific treatment for COVID-19 is currently available.	a) True	164	94.3
		b) False	10	5.7
2.18	A recommended infection prevention and control measure is to perform aerosol-generating procedures, including collection of diagnostic respiratory specimens, in an AIIR (airborne infection isolation room)	True	152	87.4
		False	22	12.6

Table 3 shows frequency and percentage distribution of perception regarding COVID -19 among health care worker in which most of the participant 72.4% answered COVID -19 as a fatal. Similarly, around half of the participants (53.4%) answered unlike the common cold, stuffy nose, runny nose and sneezing are less common in persons infected with the COVID-19 virus. Most of the participant i.e., 159 (91.4%) answered currently there is no effective cure for COVID-19 but early symptomatic and supportive treatment can help most patients recover from the infection. Similarly, most of the participants i.e., 121 (69.5%) answered only those who are elderly, have chronic illnesses and are obese are more likely to be severe cases.

Table 3: Frequency and Percentage distribution of perception regarding COVID-19 among health care worker (n=174).

S. No	Question related to perception regarding covid-19	True F (%)	False F (%)	Don't know F (%)
1	COVID-19 is fatal	126(72.4)	47(27)	1(0.6)
2	Unlike the common cold, stuffy nose, runny nose and sneezing are less common in persons infected with the COVID-19 virus.	76(43.7)	93(53.4)	5(2.9)
3	There currently is no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection.	159(91.4)	14(8.0)	1(0.6)
4	Not all persons with COVID-19 will develop to severe cases.	150(86.2)	22(12.6)	2(1.1)
5	Only those who are elderly, have chronic illness and are obese are more likely to be severe cases.	121(69.5)	49(28.2)	4(2.3)
6	Eating or contacting wild animals would result in the infection by the COVID-19 virus.	51(29.3)	113(64.9)	10(5.7)
7	Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus.	111(63.8)	60(34.5)	3(1.7)
8	It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus.	28(16.1)	144(82.8)	2(1.1)
9	To prevent the infection by COVID-19 individuals should avoid going to crowded places such as train stations and avoid taking public transportations.	168(96.6)	5(2.9)	1(0.6)
10	Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus.	163(93.7)	2(1.1)	9(5.2)
11	People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. (In general, the observation period is 14 days.)	168(96.6)	5(2.9)	1(0.6)

Table 4 shows no significant association of knowledge regarding COVID-19 among health care worker with participants' characteristics. Overall, more than half of the HCWs (55.7%) had adequate knowledge about COVID-19.

Table 4: Association of knowledge regarding COVID-19 among healthcare workers with their selected demographic variables.

S. No	Variable	Group	Knowledge		X^2 Value	P-Value
			Adequate (%)	Inadequate (%)		
1.	Age	18-28	70(53)	62(47)	3.496	0.321
		29-38	19(67.9)	9(32.1)		
		39-48	8(61.5)	5(38.5)		
		49-59	0(0.0)	1(100)		
2.	Sex	Male	26(59.1)	18(40.9)	0.267	0.368
		Female	71(54.6)	59(45.4)		
3.	Religion	Hindu	87(56.5)	67(43.5)	4.187	0.242
		Islam	5(62.5)	3(37.5)		
		Buddhist	1(16.7)	5(83.3)		
		Christian	4(66.7)	2(33.3)		
4.	Occupation	Doctor	15(46.9)	17(53.1)	1.296	0.730
		Nurse	63(57.3)	47(42.7)		
		Lab Technician	16(59.3)	11(40.7)		
		HA	3(60)	2(40)		
5.	Department	Emergency	25(65.8)	13(34.2)	3.576	0.311
		Medical Ward	19((45.2)	23(54.8)		
		ICU	37(55.2)	30(44.8)		
		Laboratory	16(59.3)	11(40.7)		
	Total		**97 (55.7)**	**77 (44.3)**		

Table 5 shows association of perception regarding COVID-19 among health care worker with selected participant characteristics. Variables such as sex (p-value: 0.022), occupation (p-value: 0.016), working department (p-value: 0.007) showed significant association, whereas rest of the participants characteristics were not associated with perception of HCWs relating to COVID-19. Overall, around half of the HCWs (52.9%) had positive perception about COVID-19.

Table 5: **Association of perception regarding COVID-19 among health care workers with their selected demographic variables.**

S. No	Variable	Group	Perception		X^2 Value	P Value
			Positive (%)	Negative (%)		
1.	**Age**	18-28	75(56.8)	57(43.2)		
		29-38	9(32.1)	19(67.9)	6.550	0.088
		39-48	7(53.8)	6(46.2)		
		49-59	1(100)	0(0.0)		

2.	**Sex**	Male	17(38.6)	27(61.4)	4.791	0.022
		Female	75(57.7)	55(42.3)		
3.	**Religion**	Hindu	79(51.3)	75(48.7)		
		Islam	6(75.0)	2(25.0)	4.879	0.181
		Buddhist	5(83.3)	1(16.7)		
		Christian	2(33.3)	4(66.7)		
4.	**Occupation**	Doctor	18(56.3)	14(43.8)		
		Nurse	63(57.3)	47(42.7)	10.346	0.016
		Lab Technician	7(25.9)	20(74.1)		
		HA	4(80.0)	1(20.0)		
5.	**Department**	Emergency	18(47.4)	20(52.6)		
		Medical Ward	24(57.1)	18(42.9)	12.075	0.007
		ICU	43(64.2)	24(35.8)		
		Laboratory	7(25.9)	20(74.1)		
	Total		**92 (52.9)**	**82 (47.1)**		

DISCUSSION

Focusing the global burden of COVID-19 pandemic, the present study was designed to assess the knowledge and perceptions about COVID-19 among the medical and paramedical health workers in Nepal. The majority of the participants were working in the ICU department. Among the participants, most of them knew about the Novel Corona Virus from News media (70.1%) and social media (68.4%). This shows the immense contribution of mainstream media as an outlet for information on the pandemic whereas the role of government websites seems very less in contributing awareness about COVID-19 as only 36.2% of health workers knew about the virus and COVID-19 from the government websites. Regular updating of evidence-based information through the official webpages of government of Nepal and concerned health ministry's is required to provide HCWs with the most up-to-date scientific and evidence-based information[13]. On another hand, a smaller number of HCWs (36.2%) had opportunities to attend lectures, discussions and training about Novel Corona virus. This shows that lectures, discussions and training about Novel Corona virus should be provided to maximum number of health workers. In Iran, a study concluded that there was a noticeable difference in knowledge level between different professions and recommended that periodic educational interventions and professional campaigns are still needed[14]. The findings of this study were similar with the studies of Bhagavathula et al.[14] and Kumar et al. [15].

Regarding knowledge of corona virus, more than half i.e., around 60% of HCWs knew about the origin of virus, its mode of transmission, its signs and symptoms, complications and preventive measures. In overall 55.7% of total HCWs in this study were found with adequate knowledge. Still, about 44.3% of the HCWs were found to have less knowledge. Poor knowledge about COVID-19 among HCWs reflects their perception about the pandemic, preventive and control measures taken to contain the pandemic and ultimately leads to delayed diagnosis of the disease[16]. In contrast to our findings, a study done in Saudi Arabia showed a high level of knowledge and positive attitude towards corona virus disease among

HCWs[17]. However, the present findings are supported by those of another study conducted by Bhagavathula et al.[14] and Roupa et al.[18]. As the virus being novel on one hand and insufficient data/publications on another, may be the reason behind this. Therefore, greater encouragement from health authorities is essential to provide COVID-19 related knowledge to all categories of HCWs thorough different possible ways.

This study showed that about more than half of the participants had positive perception regarding COVID-19. Nearly 72.4% of participants perceived that COVID-19 is fatal and 91.4% believed that there is currently no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection. Regarding the COVID-19 severity, most of the health workers (86.2%) had perception that not all the person with COVID-19 infection develop into severe complications and 69.5% of them also believe that old age groups, obesity and other comorbidities like hypertension, CKD and respiratory disease are more prone to develop severe complications. The report published by CDC, China in 2020 showed increased fatality rate among patients with preexisting comorbidities-10.5% for cardiovascular disease, 7.3% for diabetes, 6.3% for chronic respiratory disease, 6.0% for hypertension, and 5.6% for cancer[19]. More than 90% of the participants believed that, for prevention from COVID-19 infection, individuals should avoid going to crowded places such as train stations and avoid taking public transportations. This finding is in par with the study conducted among Nigerian health workers.[20] People infected with COVID-19 virus should be isolated and treated and even individual who gets contact to COVID-19 infected people also should be isolated at least for 14 days. In overall 52.9% of total health workers in this study had positive perception regarding COVID-19.

In this study association of knowledge regarding COVID-19 among health care workers was not found significant relative to age, sex, religion, occupation and their working department. The association of perception regarding COVID-19 among health care workers was found significant relative to sex, Occupation and working department whereas; rest of the demographic variables were not associated. In this study doctor and nurse working in the ICU departments had higher positive perception on COVID-19 as compared to other department and professions like laboratory and lab technician. The possible explanation for this is doctors and nurses are more educated in infectious disease and pharmacotherapy because of their continuous professional development[14]. They are more aware and careful because they need to be exposed to the infected patients directly for medical interventions as compared to lab technicians.

CONCLUSION

This study revealed comparatively unsatisfactory level of knowledge and positive perception regarding COVID-19 and infection control measures among HCWs. As the understanding about COVID-19 disease is rapidly increasing, there is need for regularly updating the HCWs about new guidelines and protocols for COVID-19 prevention and control. Our findings underscore the need of adequate training, dissemination of trust worthy information sources of information about COVID-19 and safety measures to the HCWs for the containment of Covid pandemic.

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