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Review Article

Vaccine hesitancy amongst the tribal population of India: a comparative scenario between COVID-19 vaccination and routine immunization

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ABSTRACT

Vaccine hesitancy plays a crucial role in slowing down the efforts towards achieving an immunized and healthy society, particularly, children and women. VH is very conspicuous among the economically marginalized tribal and indigenous population. Previous research papers have not presented a comparative scenario between VH for RI and COVID-19 and have not discussed in detail different reasons behind VH from the gender perspective among tribal population. The key research question for this systematic review is whether the vaccine hesitancy for routine child vaccination among the tribal population will reduce or escalate or show no change after COVID-19 vaccination drive. This paper using Google Scholar database identified the research paper and reports, published between 2013 and 2023, and synthesized the factors contributing to vaccine hesitancy among the tribal population. While hesitancy due to reasons such as the safety and trust concerns, related to vaccines and the government; strong dependency on natural remedies; decision making dominated by social and cultural norms prevailing since ages; emerged as the key resistant in case of routine immunization among the tribal population, these were observed to be similar, to a large extent, in case of COVID-19, as well, in spite of two different age groups being the target of the vaccination drive. The paper identified key enablers and barriers of vaccine acceptance, which will be insightful for policy makers, healthcare agencies and professionals working to eliminate VH among tribal and indigenous population.

Keywords: Vaccine hesitancy, Tribal population, Routine immunization, COVID-19 vaccination

INTRODUCTION

Vaccine hesitancy (VH) is a health threat characterised by delayed acceptance or refusal of vaccinations despite of its availability often due to psychological, sociocultural, and political factors.[1,2] In India, and listed as one of the top 10 health threats.[3] VH individuals are a heterogeneous group holding varying degrees of indecision about specific vaccines or vaccination in general and may accept all vaccines but remain concerned about vaccines; some may refuse or delay some vaccines; some individuals may refuse all vaccines.[4] In India, VH during the polio vaccination campaign has been a significant challenge to polio elimination, potentially contributing to the re-emergence of vaccine preventable diseases (VPDs).[5] Studies show varying levels of VH or refusal to take the COVID-19 vaccine in India ranging between 14% to 83% and globally, particularly among Black, Indigenous Native American, and Indigenous People of Canada, including First Nations.[6-8] India is having one of the largest tribal populations on the planet and comprising 8.6% of the total population with reference to the census report faces marginalization and limited access to essential services like sanitation, information, healthcare systems and other necessary services due to socio-economic factors, inadequate consideration of terrain,

environment, culture, and social systems.[9,10] VH hinders routine immunization coverage for children due to social stigma, distrust, misconceptions, knowledge gaps, and fear of certain vaccines.[11] Quality of vaccination services, availability, accessibility, affordability and lack of confidence in vaccine safety also influence vaccination decisions.[12,13] Economic status and attitudes towards the health system significantly influence the prevalence of VH. Remote public health facilities face challenges like lack of qualified personnel, equipment, and pharmaceuticals. Tribal communities face socio-cultural prejudice, leading to malnutrition, high mortality rates, and mortality are common in most tribal regions, particularly in central India.[14] Several surveys suggested spread of misinformation, lack of credible sources of information and trust deficit on government health information networks as well as lack technological literacy and poor internet connectivity also contribute to hesitancy.[15]

This paper explores the perception of VH in tribal populations, particularly regarding COVID-19 and RI. It aims to perform narrative review to understand tribal communities' perspectives on vaccination risks and challenges, and analyse reasons for VH. The key research question is questions whether the VH for routine child vaccination will decrease or increase after the COVID-19 vaccination drive. Objectives of current review were; to find the reasons for hesitancy for routine childhood vaccination and COVID-19 vaccination among the tribal populations of India using data available from previous 10 years and to recommend alternate strategies to improve the vaccine coverage among the vulnerable population.

METHODS

A systematic search for relevant research articles was conducted in Google Scholar database using various combinations of keywords like “vaccine hesitancy”, “tribal population”, “routine immunization”, “childhood vaccination”, “COVID-19 vaccination”, and including “India” to identify all studies published between 2013 and 2023. The inclusion criteria were studies conducted on tribal or indigenous population belonging to a recognized ST as per Article 342 of the Indian constitution and studies reporting any one of the following outcomes: vaccine hesitancy”, “tribal population”, “indigenous population”, “routine immunization”, “childhood vaccination”, “COVID-19 vaccination in indigenous or tribal population”, “gender disparity” in vaccination among tribal population”. The exclusion criteria were studies that did not specify the name of the tribal population as well as review articles of all kinds. The phrases "tribals" and "indigenous" were used interchangeably throughout this study. The Word Cloud generator was used to analyse all referred research papers and articles to identify common enablers and barriers of vaccine acceptance among tribal and indigenous populations.

This following section explores VH among tribal populations in India, focusing on RI and COVID-19 vaccinations. Further, the Word Cloud generator helped to pictorially collate various barriers and enablers of vaccine acceptance (Figure 1), highlighting the most common factors contributing to VH and those that can facilitate efforts to reduce VH.

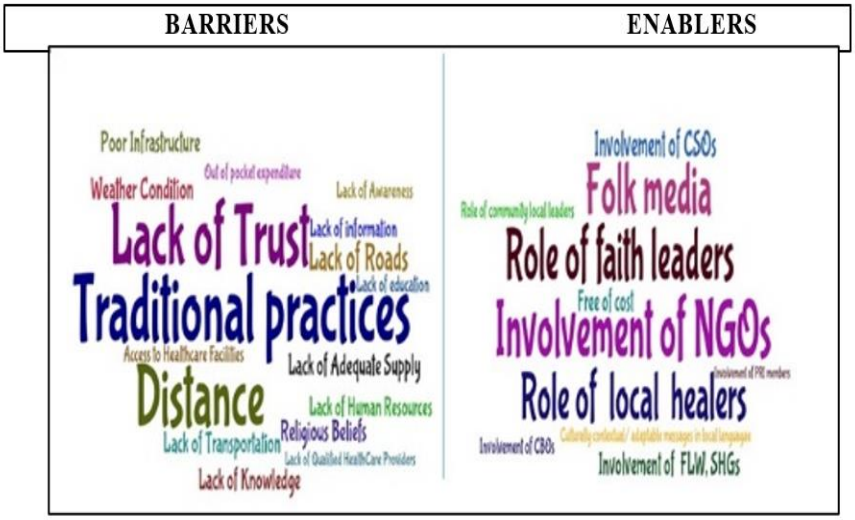

Figure 1: Various barriers and enablers of vaccine acceptance.

FACTORS CONTRIBUTING TO VACCINE HESITANCY

Since 1985, Indian government is offering free immunization services under Universal Immunization Programme to children, but the national immunization rate in general population remains 76%.[16] Scheduled tribes (ST) in India have higher VH compared to other castes, with only 58% of children receiving all age-appropriate vaccinations.[16,17] Although a small fraction of

people have been reluctant to get vaccines for centuries, the COVID-19 epidemic is expected to magnify its negative impacts and the tribal community is hesitant to receive vaccination due to lack of awareness about the disease and the vaccine.[18,19] Since the onset of COVID-19 in 2020, India has seen over 44 million cases, 5 lakh deaths, and 2 billion vaccine doses. However, no data exists on vaccination coverage among the tribal population. The Tribal health report highlights the scarcity of data on health culture, systems, and status among the tribal population. Key predictors of VH include socio-demographic, economic, vaccine knowledge, conspiracy belief, vaccine attribute, and psychological factors.[20] The review identified key predictors of VH which can be categorized as socio-demographic, economic, knowledge about vaccine, conspiracy belief, vaccine attribute and psychological factors.

Socio-cultural factors, religious beliefs and lack of awareness

Religious beliefs and traditional practices, such as ancestral customs and superstitious practices, significantly influence hesitancy towards vaccination in indigenous populations in Southeast Asian countries like Mongolia, Thailand, Vietnam as well as South Asian countries like Bangladesh , India and Pakistan.[21-23] A study in tribal population of Thane, Maharashtra found a significant association between vaccination status and religion, with Hindu children receiving more complete vaccinations.[23]

Similarly, a study in West Bengal found that tribal people in the region believe they don't need the COVID-19 vaccine, based on their belief in their indigenous medicine system and the belief in VH.[19] The tribal population faces barriers to COVID-19 vaccine acceptance due to myths about infertility, government control measures like vaccines for birth control are prevalent, poor literacy, lack of vaccine benefits awareness, and misconceptions about pig fat in vaccine preparation, vaccinated individuals dying within three months, and post-vaccination infections.[24]

As far as RI of children is concerned, different reasons for VH include, lack of awareness, incorrect information about immunization locations and timings, illness during immunization sessions, and irregular timings. Parents also face difficulties accessing immunization information while traveling for work, highlighting knowledge gaps regarding benefits and risks.[11] Ancestral customs and superstitious beliefs like diseases often result from hostile spirits, ghosts, taboo violations, and God curses. The people of the tribal communities, therefore seek treatments through magical and religious rituals in an effort to appease supernatural forces rather than travelling to receive contemporary medical care.[25]

Gender gap

Moving further, gender being a socio-cultural construct, significantly influences health behavior and vaccination status in children.[26] Only a few studies among tribal population in context of vaccination has been found during the review. A study in Barak Valley, southern Assam, found that boy children were more likely to be fully vaccinated than girl children.[27] On the contrary, studies also found that gender of the child was not significant predictors for VH.[28,29]

The review of COVID-19 vaccination literature reveals gender differences in perceived risk and preventive measures adoption. However, these studies covered all sections of the society and not specifically the tribal population. One of the studies conducted in locations with sizeable tribal population as well, brought out that women were considered least prioritized group for vaccination as they don't frequently go out and therefore are considered to be at low risk of contracting virus.[24] Women in India were more willing than men to get vaccinated.[30] Disparities in distribution are exacerbated by misinformation, access issues, and patriarchal social norms which lead to women receiving fewer vaccinations than men.[31]

Scepticism about fear of side effects and efficacy

Further, in our review it was found that fear of side effects and efficacy of the vaccination play a major role in VH. Sarkar et al study revealed that fear of side effects and vaccination efficacy significantly contributes to VH among 78% of tribal population in Berhampore block, West Bengal, who experienced decreased family income due to lockdown measures. They were concerned that any side effects following COVID-19 vaccination may further result in loss of working days leading to further economic loss. This fear prevented them to take COVID-19 vaccine.[19] Personal, family, or community experiences with vaccination, especially fear of mild side effects such as redness or pain in injection site or low grade fever are important drivers of not getting vaccinated concerns were also observed among a tribal community of Meghalaya.[32]

A need assessment conducted by UNICEF among the tribal population in the non-North East states of India highlighted that the tribal communities had more faith in traditional beliefs and that modern medicine conflicted with their cultural beliefs.[33] A study in Mandla district, Madhya Pradesh, India, found that tribal communities in India still rely on traditional healthcare practices for various ailments which in turn also attributed to their hesitancy towards COVID-19 vaccine.[34] Their belief in natural remedies and traditional food practices, such as consumption of herbal drink (Kadah), warm water, turmeric milk, vitamin C rich food items or sour food) and traditional food practices, including Mahua liquor (made from flower of Madhuca longifolia is an Indian tropical tree and Kadaknath chicken (a breed of chicken

known for its nutritional value to boost immunity) build their immunity and reduce the risk of contracting the virus.[24]

Poor healthcare services in tribal areas

Strong faith in traditional and natural remedies, on one hand and on the other, lack of trust in government and healthcare system are seen as major factors that have contributed towards VH among tribal population. The lack of HR and poor/no infrastructure in tribal areas also impacts vaccine uptake, adding to the reasons for VH. The tribal population faces challenges such as lack of transportation, difficulty in reaching health centers, wage loss, and limited trained HR in remote areas. Language barriers and a shortage of medical professionals, particularly doctors and nurses in Primary Health Centres (PHCs), further complicate healthcare delivery.[35] A study on vaccine awareness, accessibility, and acceptability in tribal districts of Odisha found that distance from vaccination clinics and lack of clinics, leading to long wait times and missed vaccinations, significantly hindered vaccine uptake.[36] A need assessment conducted by UNICEF in Maharashtra and Madhya Pradesh highlighted that while some PHCs serve more than 50,000 people, SCs serve around 10,000 only. This strains the healthcare system and reduces the level of care that can be provided to entire community.[33] A qualitative study on healthcare barriers among Assam's tribal population from the service providers' perspective reveals that the main obstacle for doctors, and para-medical personnel was lack of transportation and communication, especially during flooding monsoons.[37] Infrequent interaction between health professionals and community members weakens tribal population's trust in government health facilities. However, to some extent, the vaccine acceptance for COVID-19 vaccination was high. Favourable perception due to the vaccination being planned at the government facilities monitored by the government agencies, and therefore communities had a high level of confidence and trust.

Reasons for trust included, easily accessibility of public health facilities; better-trained health providers, no bias; genuine vaccine; and likely to be made available free or at a nominal fee. The study highlighted that the current government-run immunisation programme for children, in particular, has earned the trust of the tribal communities in government facilities and providers in India.

Participants believed that because these immunisation programmes (Mission Indradhanush), like many other government public health services, are provided free of cost, the government will also provide the facilities in this case (COVID-19 vaccination) and bear full responsibility for the well-being of the people if anything goes wrong.[24] Inadequate availability of health providers and lack of infrastructure, particularly in places like migrant settlements, rural areas, tribal areas, and urban slums, adds to the VH among the tribal population.

Role of media and communications in vaccine uptake

Media is an important institution to reach out to mass audience with information and issues of concerns and also plays a crucial role in influencing health-related behaviors and vaccine uptake.[38] Existing literature highlights that both positive and negative media reports can demotivate individuals from obtaining the vaccine. In context of tribal of population, in order to investigate the influence of media on health behavior or COVID-19 vaccine uptake per se, it is crucial to first look at their accessibility and exposure to media.

Contrary to the discussion above, which suggests that the modern media affects vaccine uptake behavior among general population, a study conducted in Jharkhand state's tribal population found that they rely on traditional communication methods for interpersonal interactions, interaction with local government (Gram Sabha), and public announcements in their native language. They had no exposure to mass media due to lack of television set and electricity, poor literacy, and limited access to internet or smartphones. Only a few members read newspapers occasionally, and few had social media accounts due to lack of internet access or smartphone ownership.[39] A study among the Zeme Nagas tribal community in North East India revealed low media accessibility and popularity. However, the community favoured folk media as it was perceived as more effective, easily understandable, and participatory, making the information more powerful and easily embraced. A study among the Zeme Nagas tribal community in North East India revealed low media accessibility and popularity. However, the community favoured folk media as it was perceived as more effective, easily understandable, and participatory, making the information more powerful and easily embraced.[40,41] During COVID-19 pandemic, as myths and misinformation around COVID-19 and its vaccine were doing the rounds in different parts of the country, hesitancy towards uptake of COVID-19 vaccine was also observed among tribal communities.[42]

A culturally contextual communication strategy becomes crucial to address issues around VH and motivate tribal communities for vaccine uptake. Keeping this as the bottom line, The Integrated Tribal Population Project in Dharni, Maharashtra, developed a series of videos and plays in April 2021 to address issues around VH and motivate tribal communities for vaccine uptake. The videos and plays featured tribal members disseminating accurate information on COVID-19 and dispelling myths. The information was shared in local language, building trust between villagers and health officials.[43]

News reports published during the initial phase of COVID-19 vaccination drives among tribal populations in India emphasized that traditional communication methods played a crucial role in mobilizing communities

for vaccine uptake. As of July 2021, 67.3 million doses of COVID-19 vaccination (including first and second shot) were administered to the tribal population. Community leaders from tribal districts in Madhya Pradesh and Chhattisgarh participated in the campaign, taking the vaccine and motivating community members for its uptake.[44]

Likewise, importance of dissemination of information regarding COVID-19 and vaccination through appropriate sources was emphasized in a study conducted among the tribal community from Madhya Pradesh. Tribal community had realization of being deprived of accurate information about COVID-19 vaccine and demanded to be informed about it through the sources which they would want to get the information.[24] A few research reports and papers show that social media, despite its limited reach, has a significant impact on the health behavior of Indian tribal populations, particularly in relation to COVID-19 vaccine uptake per se, the scope and potential of social media in influencing their behavior cannot be overlooked. A study in West Bengal, India, found that social media influences lifestyle, food habits, dressing, and livelihood.[45] The rise of modern media has also led to a growing preference for modern media among tribal youth.[40,46] Thus, mass media and social media can be powerful tools in promoting positive health behavior in tribal communities.

IMPLICATIONS OF COVID-19 ON ROUTINE IMMUNISATION IN TRIBAL POPULATION

The COVID-19 pandemic and lockdown significantly impacted children's RI schedules, causing a 2-6 month delay in the RI program and a decrease in global childhood immunization coverage from 86% (2019) to 81% (2021).[47] The hesitancy for routine vaccination prior and during pandemic was found to rose from 5% to 38% and it was found to be statistically significant (p=0.003).[48] A study in five Indian states revealed that barriers to RI services during the COVID-19 pandemic included limited transportation facilities, movement restrictions, and lack of routine vaccines. This led to stock out of different vaccines for several days and thereby disturbed RI schedule of not only the families but that of the health facilities, as well. Mobilizing beneficiaries to immunization sessions was also challenging due to reluctance among parents and families to leave their children at home, fearing the risk of contracting COVID-19.They perceived that visiting hospitals and meeting medical staff carried the risk of contracting COVID-19 infection.[49] The COVID-19 pandemic has led to a shortage of health workers and a shift in resources from routine care to COVID-19 care, reducing the supply of routine service acted as a barrier to vaccination. This has impacted vaccination programs, non-COVID activities, and overburdened health service providers. Some facilities have only one health worker performing vaccination tasks, such as registration, counselling and administration of vaccine. This has resulted in a significant barrier to vaccination and a decrease in routine services.[50] Some visible impacts were FLWs' priority and focus shifted to services related to COVID-19 pandemic and RI programme stopped, as non-COVID health care services were not operational in the public and private health facilities, across the country for some months. Non availability of health personnel affected the vaccination program; it affected non-COVID activities like UIP, antenatal check-ups, field visits, among others. In some cases, health service providers were over-burdened due to diversion of service providers to control COVID-19 pandemic. In some facilities only one health worker has to perform various tasks related to vaccination such as registration, counselling of clients and administration of vaccine.[50]

MEASURES TO REDUCE VACCINE HESITANCY

The review identified various evidence-based ways and means to minimize vaccination hesitancy and to promote vaccination among tribal population.

Engagement of faith leaders and local influencers

Importance of proper information through appropriate sources emerged as an important factor. Tribal and faith-based leaders have great respect and influence among their community members. Engagement of faith leaders as 'vaccine ambassadors' in vaccine campaigns in rural India was found to be beneficial. Those who lacked trust in vaccines and were sceptic about the potential side-effects felt reassured by seeing engagement of faith leaders, they recognized and respected, supporting the vaccination drive. The videos presenting the faith leaders via social media was helpful in motivating families and had a positive impact among caregivers, mothers and fathers to understand the benefits the vaccines offer for their health as well their children. This also served as a helpful supplement for Community Health Workers (CHWs) to improve their communication with caregivers regarding vaccines.[51]

According to Priya et al local healers involvement in tribal vaccination systems enhances vaccine acceptance among the tribal population. Suggestions were made to train the local healers in vaccinating the children and also playing a role of facilitator to encourage the population to come forward to get the children in the family.[52] Similarly Singh et al too highlighted that involving religious leaders through congregations in religious places and the primary body of the Panchayati Raj Institution (PRI) system through regular meeting, will be important to increase awareness about immunisation and its benefits to the community and Soni et al highlighted involvement ward members, medical doctor at public health facilities, ration shop dealers under the public distribution system for food grains, mother's group improved vaccination uptake.[53,54]

Collaboration with NGOs and CBOs

Collaboration with non-governmental organisations (NGOs) and community-based organizations (CBOs) boost vaccine demand, distribution, and uptake, especially among marginalised and disadvantaged people and also build public trust in vaccines and catalyses public participation. This partnership helped to identify poor coverage and/or inaccessible locations, prioritise these areas, and assist supply-side measures, planning for vaccination distribution, generating demand through community involvement, and social mobilisation.

NGOs provided support in physical mobilisation of the elderly and people with disabilities to vaccination facilities; establish referrals; connect beneficiaries for improving vaccine access and conducting follow-ups; and conduct need-based assessments to understand misconceptions regarding the COVID-19 vaccination and combat VH.[54] Engaging and empowering CBOs to mobilize the communities for the uptake of immunization services along with spreading awareness and eliminating stigmas associated with COVID-19 and increased awareness in their communities specially in ensuring the immunization of children in tribal community CBOs and influencers have significantly increased community awareness particularly for children in tribal communities. They have also raised issues in village council meetings (gram panchayat) making immunization a crucial topic of discussion.[55] Similarly the involvement of the voluntary service organisations like mahila mandals (women's groups) during door-to-door visits, information disseminated through schools, ashrams (monasteries), self-help groups, and NGOs were also effective modes of communication in the tribal community.[53]

Information coming through a familiar source

Community had realization of being deprived of accurate information about the vaccine coming from unfamiliar sources. Majority of the study participants mentioned the source(s) through which they would want to get the information and necessary messages. Information coming through familiar source(s), someone from their own community such as Tadvi (Adivasis' local leader), Sarpanch (village head), frontline health workers (FLWs) and district administration will certainly motivate the community towards vaccination. Regular interaction with these information providers about the vaccine, to understand the benefits and myths related to the vaccine, and addressing the concerns around the side effects of vaccines, if any would help to build confidence and trust among the community.[24]

Use of traditional and folk media

Mike announcements, through religious places or congregation was identified as an effective way in reaching out to illiterate population, who are generally found to have more faith and trust on their religious leaders, along with the other mediums of communication such as wall paintings and street theatres for the information. Also reminding about successful vaccination campaigns like polio campaign, other vaccinations that are already being administered and connecting to COVID-19 vaccination campaign may help in building trust and motivating community people to get vaccinated.[24] Similar views were also observed in case of RI in children.[56]

DISCUSSION

There is a dearth of literature on VH in tribal population.[57] More specifically, research papers and articles highlighting discussion on gender disparity in context of VH or acceptance among tribal population was not found. VH is a significant public health challenge, particularly among the tribal population. Factors such as poor economic status, lack of awareness about vaccination benefits, health consciousness, skepticism about the efficacy, dismal attitudes towards the health system, and inaccessibility and mistrust on the vaccine and the delivery system were acting as major factors in the perceived benefits and perceived barriers; which eventually determined the acceptance of the vaccine amongst the tribal population.[58] This review revealed clearly brought out that COVID-19 pandemic did disrupted RI resulting in decrease in the children vaccination rate during the pandemic or delay in vaccination child immunization services in India including the tribal population.[59,60] In India, uptake of COVID-19 vaccines is low in states with significant tribal population, particularly in north eastern and eastern states of India is low compared to other states. The gender disparity in COVID-19 vaccination implies that a greater number of males are getting vaccinated than female. Females are more likely than men to believe false information and rumours about menstruation, infertility, and the negative consequences of vaccinations. It may be inferred that VH was prevalent in COVID-19 vaccine uptake in India, particularly among tribal populations and marginalized communities. Post-lockdown immunization outreach and coverage initiatives increased, but did not fully offset missed immunizations particularly among the groups that are typically unreached by the health system. The shift in focus from COVID-19 to vaccination drive under RI getting adversely influenced may affect children's immunity in the long run which research studies may bring out in future.

CONCLUSION

The present review provides a picture of paucity of published data about VH especially in tribal population in India and more specifically to bring out gender preferences. To address VH, building trust in public primary care facilities, emphasizing RI, and engaging key influencers can improve RI status among tribal populations. Even though COVID-19 is no longer a pandemic but it re-emerges from time to time as noticed

in December 2023. Hence, the uptake of COVID-19 vaccine among tribal populations can be emphasized through various communication channels. Government and health service providers can minimize VH in RI drive by building trust in primary care facilities, emphasizing RI during pandemics, and engaging key influencers such as religious and faith leaders, tribal heads and other stakeholders working at community and capacity building of local leaders/influencers level would definitely improve RI status among tribal populations, in particular. Integrating local healers not only as 'vaccination counsellors' in the immunization programme but can be trained to vaccinate the child, particularly in hard to reach and far-flung areas of the tribal communities into the vaccination distribution system will improve the reach of RI among tribal population. The collective use of the identified key enablers and barriers of vaccine will guide in scaling up the vaccination coverage be it COVID-19 vaccination or RI of children for policy makers, healthcare agencies and professionals working to eliminate VH among tribal and indigenous population.

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