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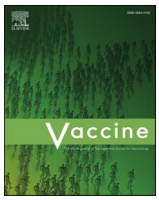

Barriers to COVID-19 vaccinations and moral struggle among nurses in a Chinese community: A critical medical anthropology analysis

Judy Yuen-man Siu [a,b,c,*,1]

[a] Department of Applied Social Sciences, Faculty of Health and Social Sciences, The Hong Kong Polytechnic University, Hong Kong, People's Republic of China
[b] International Research Centre for the Advancement of Health Communication, The Hong Kong Polytechnic University, Hong Kong, People's Republic of China
[c] Research Centre for SHARP Vision, The Hong Kong Polytechnic University, Hong Kong, People's Republic of China

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ABSTRACT

Background: Past studies have shown that people are less inclined to get vaccinated when healthcare providers are hesitant about the immunisation. Nurses have been documented as the most hesitant healthcare group towards COVID-19 vaccination in both Western and Chinese communities. This study investigates the perceptions of COVID-19 vaccines among nurses in a Chinese society and the reasons contributing to their high hesitancy.
Methods: A qualitative descriptive approach was used, involving in-depth semi-structured interviews from September to December 2022 with 35 nurses in Hong Kong who did not receive COVID-19 vaccinations. A thematic analysis of the data was implemented in accordance with the critical medical anthropology framework.
Results: Two themes were identified: barriers to receiving COVID-19 vaccinations and the moral struggles of participants in not getting vaccinated. Participants demonstrated a lack of confidence and individual safety concerns, related to the negative information shared among their healthcare colleagues and non-healthcare workers through social media platforms. Participants revealed resistance towards the vaccination policies of the government and their workplaces, and they distrusted the commercial and profit-oriented nature of the vaccines against COVID-19.
Conclusion: At the individual level, participants' lack of confidence and worries about vaccine safety emerged from the intertwined relationship of the negative information shared among their healthcare colleagues and non-healthcare workers through social media platforms at both the individual and micro-social levels. In addition, resistance was seen at the intermediate-social level, involving distrust of the profit-oriented nature of the capitalist operation, as well as cultural confidence in the efficacy of traditional Chinese medicine against COVID-19 infection at the macro-social level. This study suggests that addressing the agents that can affect nurses' socialisation process at different social levels according to the critical medical anthropology framework is crucial for motivating nurses' vaccine acceptance.

1. Introduction

Vaccinations are one of the most effective methods to protect against vaccine-preventable diseases, such as the coronavirus disease (COVID-19) [1,2]. Around 67 % of the world population has received a complete primary series of COVID-19 vaccine, whereas only 32 % has received at least one booster dose as of December 2023 [2]. Without a booster dose, approximately 68 % of the world population remains unprotected against the newer strains of COVID-19 virus [2,3].

Healthcare providers are known to influence people's vaccination behaviour, and they are the most trusted source of vaccination advice for the public; indeed, their encouraging attitude about vaccinations can motivate people's vaccination behaviour [4]. Whether healthcare providers encourage vaccination is determined by their attitude towards the vaccine, and those who have a more positive belief have higher motivation to encourage vaccinations to the public [5,6]. Past studies show that there is a positive relationship between doctors' positive perceptions of vaccines and their intention to motivate patients' vaccination, and the belief of efficacy and safety is decisive in affecting whether doctors encourage their patients to get vaccinated [4,7]. Sharing positive knowledge about a vaccine among healthcare providers can help encourage vaccination at the public level; therefore, it is important to

* Address: GH339, Department of Applied Social Sciences, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, People's Republic of China.
E-mail address: judy.ym.siu@polyu.edu.hk.
[1] 0000–0003–0825-6564.

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investigate how healthcare providers perceive and behave towards a vaccination.

A scoping review of 35 studies conducted in American, European, African, and Asian societies shows that COVID-19 vaccination hesitancy in healthcare workers ranged from 4.3 % to 72 % worldwide [8]. Different groups of healthcare workers have different levels of hesitancy towards COVID-19 vaccines [9]. In a cross-sectional study, doctors showed the least hesitancy towards COVID-19 vaccines, whereas nurses had the second-highest level of hesitancy [9]. This resistance has also been indicated in other studies, where nurses have been documented as the most hesitant group of healthcare providers towards COVID-19 vaccination in both Western and Chinese communities [10–12]. One survey conducted in Hong Kong by Wang et al. [13] shows that only 40 % of their nurse participants between 26 February and 31 March 2020 intended to accept COVID-19 vaccination. Another study, by Kwok et al. [12], shows that their nurse participants' COVID-19 vaccination acceptance was 63 % between mid-March and late April 2020 – regarded as suboptimal for achieving herd immunity [12]. In these two studies, concerns about the vaccine's safety, efficacy, and effectiveness were noted as common barriers to vaccination among the sampled nurses [12,13]. People are less inclined to get vaccinated if healthcare providers are hesitant about immunisation [14]. As nurses are the healthcare providers who have the most contact hours with patients [15], their high vaccine hesitancy is expected to have a negative impact on patients' acceptance of immunisation. Therefore, this study investigates the perceptions of COVID-19 vaccines among nurses in a Chinese society, Hong Kong, and the reasons contributing to their hesitancy towards COVID-19 vaccines.

2. Theoretical framework and research significance

The health belief model and the theory of planned behaviour have been widely applied to analyse vaccination-related behaviour worldwide [12,16–22]. Past studies adopting these two models commonly point to personal knowledge and attitude, risk perceptions, perceived behavioural control, and subjective norms as factors that affect people's acceptance of COVID-19 vaccination. However, vaccine hesitancy is a complex, multilayered construct that is rooted in the sociocultural structures of a particular society [23]. Hence, the health belief model and the theory of planned behaviour are limited in providing a sufficiently comprehensive analysis of vaccination-related decisions. Indeed, Limbu et al. [17,18] and Lin et al. [19] indicate that in addition to the factors addressed in the health belief model and the theory of planned behaviour, socioeconomic factors such as gender, education level, and income can also affect people's willingness to vaccinate. The manufacturing place of the vaccine is also a significant factor for the people of Mainland China in considering COVID-19 vaccination; higher confidence and higher preference of domestically-made vaccines over foreign-made were observed among their Mainland Chinese respondents, and their intention to get vaccinated would be increased if domestically-made vaccines were offered [19]. Therefore, to understand people's vaccination behaviour, it is important to examine the social and cultural factors that are not considered in the health belief model and the theory of planned behaviour.

The Strategic Advisory Group of Experts on Immunisation (SAGE), a group that advises the World Health Organization, suggests that vaccine hesitancy should be understood from a social-ecological focus, and it can include factors of complacency, convenience, and confidence that cover contextual (e.g., historic, sociocultural, environmental, health system/institutional, economic, or political factors), individual, and group influences (e.g., personal perception of the vaccine, influences of the social/peer environment) and vaccine-specific issues [24]. Brewer's Increasing Vaccination Model further indicates that vaccination uptake is a complex construct of different social and cultural forces, involving what people think and feel about the risk and effectiveness of vaccines as well as social processes involving social norms, social networks, a sense of altruism, and direct behavioural changes [25]. The World Health Organization's Behavioural and Social Drivers of Vaccination Framework echoes that vaccination behaviour is a complex construct involving thinking and feeling as well as social processes that can affect a person's vaccination motivation and thus vaccination behaviour [26]. The social process – in particular, social norms and social networks – is the common focus of these recent vaccination frameworks.

Social norms are unwritten standards of acceptable behaviour shared among members in a society, and they can influence human behaviour [27]. The construction of social norms is a process. In the psychology literature, learning social norms is viewed as a psychological process rooted in a biological basis of adapting to and learning about a society [28]. Zhang et al. [29] suggest a three-stage model of social norm learning, involving the processes of pre-learning (individuals perceive social norms and collect social information), reinforcement learning (feedback from other social members allows an individual to learn about the social norms), and internalisation (an individual regards the social norms as personal and moral values, a majority norm, and a default option) [29]. Sociologists, meanwhile, view social norms as a social construct but argue that learning social norms is a socialisation process in which social interaction and moral development are key [30]. Significant others – e.g., social networks and mass media – are important agents in the socialisation process [30,31]. This is consistent with the Increasing Vaccination Model [25] and the Behavioural and Social Drivers of Vaccination Framework [26], which note the importance of one's social network in the development of social norms in vaccination behaviour.

Social norms that involve significant others such as social networks and mass media are thus crucial in affecting vaccination behaviour. The significant gap in hesitancy towards COVID-19 vaccines between doctors and nurses [9] suggests that the social norms of nurses are different from those of doctors. The influence of social norms for healthcare providers regarding vaccination is also more complicated than for the general public, as their social norms involve expectations from society and moral obligations based on their status as healthcare providers [32]. Indeed, they are one of the most important information sources for people in making vaccination decisions [33], and nurses are expected to be advocators of vaccination [34–37]. However, little research has examined how nurses' non-vaccination behaviour is related to social norms and the socialisation process (involving social interaction and moral development) by social networks and mass media. How their non-vaccination stance can lead to a moral struggle as vaccine advocators is even more understudied. Therefore, this study investigates the social norms around a sample of unvaccinated nurses in Hong Kong, examining their experiences when their non-vaccination violates societal expectations. This study builds on the Increasing Vaccination Model [25] and the Behavioural and Social Drivers of Vaccination Framework [26]. It adopts critical medical anthropology (CMA) as the theoretical framework to guide a more comprehensive analysis of COVID-19 vaccination decision-making among nurses, which involves both micro- and macro-social processes. CMA also provides further explanation for SAGE's vaccine hesitancy model [24], investigating how economic, political, and institutional factors can affect COVID-19 vaccine hesitancy among nurses.

According to the CMA framework, health issues should be understood in the context of encompassing political and economic forces. These political and economic forces – which are embedded in the global capitalist system – can affect human relationships, collective experiences, and social behaviours in health [38]. In other words, these forces can affect the socialisation process by affecting the significant others of social networks and mass media and the development of social morals. Vaccination behaviour should thus be seen as a product originating from the intertwining political and economic forces in a social-ecological environment, with these forces serving as socialisation for people's vaccination behaviour. For example, Albrecht [39,40] points out that the political situation of the United States could influence the impact of

COVID-19 on American society, as its people's political views are a strong determinant for COVID-19 vaccination acceptance; vaccination rates were much lower in counties with a high percentage of Republican voters. Liu et al. [41] note that the spread rate of COVID-19 was lower in countries following a collectivist and Confucian ideology than in countries following an individualistic ideology, as people from collectivist communities tend to be more willing to follow infection control measures (e.g., vaccination) than those who come from individualistic communities. Moreover, collectivist communities have stronger social norms, and people from collectivist communities are more ready to follow the behaviour of their social networks during the pandemic [31].

This study adopts the CMA framework because it facilitates a systematic analysis of how the political and economic forces embedded in the capitalist system of Hong Kong socialise nurses' non-vaccination behaviours and perceptions, investigating factors at the individual, micro-social, intermediate-social, and macro-social levels. At the individual level, personal factors and social support networks socialise nurses' non-vaccination behaviours and perceptions [38]. At the micro-social level, the interaction between nurses and their healthcare colleagues socialises non-vaccination behaviour [38]. Nurses' non-vaccination behaviours and perceptions are also affected by institutional policies at the intermediate-social level and by ethnocultural and religious beliefs and capitalistic ideology at the macro-social level [38]. This study thus employed the CMA framework to investigate how nurses' COVID-19 vaccination refusal was related to the political and economic forces in the socialisation process at the individual, micro-social, intermediate-social, and macro-social levels.

3. Methods

3.1. Study design and study period

This study implements a qualitative descriptive approach, involving in-depth semi-structured interviews with 35 nurses who did not receive COVID-19 vaccination in Hong Kong from September 2022 to December 2022. A qualitative approach allows for complex and detailed understanding of an issue and the contexts or settings of participants experiencing the issue [42]. Qualitative descriptive approach also provides straightforward descriptions of participants' perceptions and experiences [43]. This approach recognises the subjective nature of the problem, and the findings are presented to reflect or closely resemble the terminology used in the research question [44]. It provides factual responses to questions about what people feel and experience [45]. Qualitative description is characterized with a lower level of interpretation and inference from the researchers, so researchers can stay closer to the data and the words used by the informants [46]. This qualitative approach fits with the theoretical framework adopted in this study. As CMA has an anthropological origin and emphasizes the comprehensive investigation of the relationship between micro- and macro-social processes and how individual health perceptions and behaviours are rooted in the context of political and economic forces, the qualitative descriptive approach allows for an in-depth and grounded investigation to answer these questions. A thematic analysis of the data was implemented in accordance with the CMA framework.

3.2. Study setting, participants, and sampling

Semi-structured in-depth interviews were conducted with 35 nurses in Hong Kong. Participants were recruited using purposive sampling, and they satisfied the following criteria: (1) not vaccinated against COVID-19 at the time of the study, (2) working as nurses in Hong Kong, (3) received nursing training and education in Hong Kong, (4) aged 30 years or above, (5) of Chinese ethnicity, and (6) residents of Hong Kong. These sampling criteria were formulated to ensure that the participants had a lengthy exposure to the socialisation of the local society and nursing culture of Hong Kong, which enabled the investigation of barriers in relation to the local sociocultural structure. Recruiting nurses who were at least 30 years old ensured that the participants had some years of nursing practice and experience in interacting and providing care to patients, as socialisation also takes place at work.

The COVID-19 vaccination rate in Hong Kong was closely tied to the implementation of the Vaccine Pass, a vaccine-incentive policy motivating COVID-19 vaccination. The Vaccine Pass was implemented in three stages, starting on 24 February 2022. In the final stage, which began on 31 May 2022, only individuals who had received three vaccine doses were allowed to enter certain public facilities [47]. COVID-19 vaccination was prioritised and made available for healthcare workers before the mass vaccination for the general public, and healthcare workers were one of the priority groups who could receive COVID-19 vaccination at an earlier time in the Vaccine Pass stages [48]. The timing of participant recruitment and sampling enabled the recruitment of nurse participants who were not motivated to get vaccinated and, subsequently, the investigation of their vaccination refusal.

Those who refuse vaccination can be regarded as a hard-to-reach, hidden, and vulnerable population, because this population is often invisible [49,50]. This is even the case for the nurses who did not get vaccinated, as this violates their social expectation and professional virtue of being advocators of vaccination [34–37,51,52], making participant recruitment from nursing associations and healthcare institutions almost impossible. Social media platforms have been feasible alternatives for recruiting this hard-to-reach and hidden population [53], and the 35 participants in this study were primarily recruited from two Facebook pages. One page was run by a medical doctor, with more than 25,000 followers during the participant recruitment period, of which a considerable number were healthcare providers. The other Facebook page was run by a nurse, with more than 9000 followers during the participant recruitment period. Posters indicating the sampling criteria were announced on these two Facebook pages with the consent of the page owners, and 14 participants were recruited. The remaining 21 participants were recruited by snowball sampling that involved referral from the participants.

3.3. Data collection

An interview question guide (Appendix 1) with an inductive design was employed. The guide was developed with reference to the literature on the barriers to receiving COVID-19 vaccination [12,13,16–22] and on the basis of fieldwork observations in Hong Kong. The interview questions were open-ended to give the participants flexibility in sharing their experiences. The author individually interviewed the participants to ensure consistency. The author did not know the participants prior to the interviews, ensuring that they would be conducted with minimal bias. All the interviews were conducted in Cantonese, which is the native tongue of the author and the participants. Selected interview quotations used in reports were translated from Cantonese to English, and back translation was employed to ensure accuracy.

Because the interviews took place during the COVID-19 pandemic, they were conducted online using the meeting platform Zoom. The author interviewed the participants in a private office at the workplace to protect the participants' confidentiality. Each interview lasted between 55 and 85 min, and the audio was recorded with the participant's consent. Each participant was compensated with a supermarket coupon worth 100 HKD (approximately 12.80 USD) by mail upon completion of the interview.

3.4. Data analysis

Data analysis was started concurrently with data collection to ensure that the interviews could be adjusted to answer the research questions. After each interview, the author documented the key points and her impressions and observations in an interview diary. The interviews were transcribed verbatim and then subjected to thematic analysis, following

Braun and Clarke [54]. All the transcripts were read and reread line by line. All the statements were extracted into codes, which were then labelled and categorised [54]. Recurrent codes were highlighted, and overlapping codes were consolidated to form broader categories and themes after repeated examination and comparison [54]. The codes, categories, themes, and supporting interview quotations were documented in a coding table. As this study follows the CMA framework, the identified codes, categories, and themes were grouped according to the four social levels of analysis. The data recorded in the interview diary were compared with the coded interview data consistently throughout the data analysis procedure.

3.5. Ethical considerations

Ethics approval was obtained from the Human Subjects Ethics Subcommittee of The Hong Kong Polytechnic University before the study began (reference number: HSEARS20200924003). The participants were informed about the purpose of this study and granted informed consent prior to their interviews. All interviews were conducted anonymously, and each participant was represented with a code to ensure confidentiality. All collected data were stored in password-protected computer files that were only accessible to the researcher.

3.6. Rigour and data trustworthiness

Data collection and analysis were conducted in accordance with the Consolidated Criteria for Reporting Qualitative Research [55]. The criteria developed by Lincoln and Guba [56] were used to ensure the robustness of the study design and methods. Data saturation was achieved; no new themes or codes emerged in the 28th interview, and seven additional interviews were conducted to confirm data saturation. Member checking was implemented, and the participants were asked to review the transcripts and interview diaries of their interviews to ensure the accurate portrayal of their viewpoints [57]. Quotations from interviews were included in the coding table to ensure that the codes, categories, and themes were consistent with the interview data. The interview diary and the identified codes, categories, and themes were compared to ensure trustworthiness in the analysed data. Recoding was performed after two months of the first coding to enhance the reliability of the analysed data.

4. Results

Two main themes were identified from the interview data. The first theme concerns the barriers to receiving COVID-19 vaccination according to the CMA framework, explaining how the participants were socialised, leading to their refusal to vaccinate. The second theme involves the participants' moral struggles after they reached the decision to not get vaccinated. Table 1 illustrates the number of participants experiencing the barriers that are discussed in detail below.

4.1. Theme 1: barriers to receiving COVID-19 vaccination

4.1.1. Individual level

The individual-level barriers are relevant to the experiences of the participants' selves and their social networks. The participants' low trust in the vaccine, in addition to bad experiences from the vaccine in their social network, led to their hesitation. The participants' low trust caused them to believe the negative information that they received about the vaccine from their social network and social media.

4.1.1.1. Lack of confidence in the vaccine. All the participants expressed a lack of confidence in the COVID-19 vaccine. The new emergence of the vaccine within a short time caused the participants to worry about its safety.

Table 1
Frequency of participants mentioning the identified barriers to receiving COVID-19 vaccination (Note: total number of participants, $n = 35$).

Levels according to the critical medical anthropology framework	Themes	Frequency n (%)
Individual level	Lack of confidence in the vaccine	35 (100)
	Side effects witnessed from their social network and their patients	31 (89)
Micro-social level	Negative information about the vaccine circulated among other healthcare providers	30 (86)
Intermediate-social level	Escaping from the vaccination policy	14 (40)
	Dissatisfaction towards the government's vaccination policy	24 (69)
Macro-social level	Scepticism towards the vaccine in relation to its perceived commercial nature	35 (100)
	Perceived strength of traditional Chinese medicine in disease prevention	20 (57)

The vaccine is too new. I am not sure if the vaccine is safe enough. Vaccines require years of tests and experiments before they can be out for people's use. Also, vaccines have to get registered with different health bodies, such as the FDA [US Food and Drug Administration]. I know the COVID vaccine has been registered and approved to use, but the approval is not a formal one, only an emergency one, so I can expect a lot of requirements may have been skipped. The whole procedure seems to be very rushed, and many normal steps have been skipped. This appears not very safe to me. (P4).

In Hong Kong, one of the COVID-19 vaccine options uses the technology of messenger ribonucleic acid (mRNA). However, this new vaccine technology worries the participants. Rumours have developed on social media around this vaccine, as the participants indicated. When the rumours were consistent with what the participants believed, they became the truth for them and reinforced their lack of confidence in the vaccine.

I am not feeling comfortable with the COVID vaccine because it uses mRNA, which is a whole new thing that I am not getting used to. Different social media platforms point together to the fact that the vaccine can change our DNA. You can never know what will happen if our DNA is changed. Will we get cancer? Will we get rare diseases? It is not worth risking these consequences because such damage is much more long-term than COVID itself. Doctors would never tell you, but only media would tell you the truth. (P11).

In addition to social media platforms, the perceptions of social networks more generally were powerful in constructing an impression of the COVID-19 vaccine for the participants. In many cases, the participants believed in the communication provided by their social network and did not have any intention to verify the information. Their trust in their social network's information correlated with their lack of confidence in the vaccine.

I know this from my friends. I believe this information could not be too far wrong if several friends have told me the same thing. Also, the danger of the COVID vaccine is already widely discussed in social media. I trust my friends, and I don't think they would deceive me. After all, we are so busy with COVID, who has time to create fake news? I trust the social media, too. Those who produce the vaccine would not tell you for sure, because this is the 'dark ingredient' [Cantonese slang meaning the hidden and negative aspects] of the vaccine, and I think only media would report the 'dark ingredients'. (P13).

4.1.1.2. Side effects witnessed from their social network and their patients. The side effects of the vaccine that the participants witnessed from their social network and from their patients reinforced their worries regarding the vaccine's safety, impacting their confidence about getting vaccinated. In many cases, the side effects that the participants witnessed were well matched with what they read on social media platforms about the vaccine's side effects.

The vaccine is very strong. My parents and husband took the vaccine, but the side effects are much stronger than other ordinary vaccines. They became quite uncomfortable and felt like they had a big flu. They needed several days to recover from these side effects. I think these vaccine side effects are not isolated cases. Quite a number of colleagues had seen patients get very strong side effects from the vaccine; we all know, and these cases have always been circulated in our WhatsApp group. (P20).

4.1.2. Micro-social level

The barriers at the micro-social level are also relevant to the participants' interaction with healthcare workers. Different from the interactions with their colleagues who are also healthcare providers, as illustrated by individual-level barriers, the healthcare workers with whom they were interacting at this level were not in their social network.

4.1.2.1. Negative information about the vaccine circulated among other healthcare workers. Information shared about the vaccine by healthcare workers whom the participants did not know provided an important information pool for them to obtain information about the COVID-19 vaccine. The negative information shared by other healthcare workers was mostly shared via social media platforms. The participants had high trust in the information circulated because it was disclosed by fellow healthcare workers who were perceived as having no conflicting interests.

Many fellows shared what they saw about the side effect cases of the vaccine on Facebook and IG [Instagram]. I don't know them personally, but I trust their information, because what they said about the vaccine is very consistent with what I and my colleagues see. I know there is a lot of fake information on social media, but I think they are more trustworthy, because they do not have any conflict of interest. They would not earn more money by saying more negative things about the vaccine. What the pharmaceutical companies say about the good things of the vaccine is not trustworthy, because they have a conflict of interest, and they are selling the vaccine. (P29).

4.1.3. Intermediate-social level

The barriers at the intermediate-social level concern the tension between healthcare providers and administrators, as well as the government and health institution policies regarding vaccination.

4.1.3.1. Escaping from the vaccination policy. Social media platforms served as a very important stage for the participants to exchange information about COVID-19 vaccination policies with their colleagues. In addition to discussing the COVID-19 vaccination requirement that was implemented in their workplaces, they would also exchange ideas about alternative ways to fulfil the vaccination requirement. Such information exchange reinforced the participants' refusal to get vaccinated.

We would discuss the [vaccination] policy of our hospital in the WhatsApp group. Many colleagues are hesitant about the vaccine, and we would share our worries in the group. We would also share the tactics of how we can fulfil the hospital policy without getting vaccinated in the group. When you know so many colleagues are not getting the vaccine, and when you know there are always ways of fulfilling the management [requirements] without getting vaccinated, you would be even more inclined towards not getting vaccinated. (P33).

Some participants expressed their dissatisfaction towards their workplaces' vaccination policy.

The management of my workplace often emphasizes that we, as healthcare providers, should set a good model for and protect our patients by getting vaccinated. However, I don't feel convinced by this idea, because it is just like a moral blackmail. Although I agree we have the responsibility to protect our patients, getting vaccinated is not the only way. I don't feel we have to sacrifice our autonomy to make a choice for our own health just because of protecting our patients. Being a nurse is only a job, and I don't feel we have to sacrifice our health and our life. (P28).

4.1.3.2. Dissatisfaction towards the government's vaccination policy. The tension between the vaccination policy implemented by the healthcare management and the participants' unwillingness to get vaccinated mirrored the participants' underlying dissatisfaction towards the government's vaccination policy – in particular, the Vaccine Pass.

I feel very bad with the Vaccine Pass because I think it is an excuse for the government to exert more control on Hong Kong people. I feel very bad with its idea that you can enjoy more freedom by getting vaccinated, and you will lose freedom if you do not obey the government. It is not a fault if I do not get vaccinated. However, what the government does in the Vaccine Pass appears like marginalising those who do not obey […] I would not deny that part of the reason for not wanting to get vaccinated is because I am not happy with this government. (P34).

4.1.4. Macro-social level

The barriers at the macro-social level involve the concepts of medical pluralism and the capitalist world system, as stated in the CMA framework. This level of barrier affected the participants' personal perceptions about the vaccine at the individual level.

4.1.4.1. Scepticism towards the vaccine in relation to its perceived commercial nature. The participants were hesitant about the safety of the vaccine because they were sceptical about its hidden commercial nature.

I do not feel safe with the COVID vaccine. The vaccine is being pushed out too quickly to the market and all governments throughout the world, and the WHO [World Health Organization] and CDC [Centers for Disease Control and Prevention] are all pushing the vaccine. The vaccine can skip the normal long procedure to come to the market and was granted emergency registration within a short time. Don't you feel sceptical? It looks like a secret deal between the vaccine producers, the pharmaceutical companies, and the various health agencies and governments. They can earn big profits by pushing out the vaccine as quickly as possible. (P12).

The participants' scepticism of the vaccine in relation to its perceived correlation with the profit-making business was reinforced by the information that they received from social media.

I have received many messages and videos about the tricks of the vaccine from WhatsApp and Facebook. All these messages point to the big profit in the backstage. The pharmaceutical companies are really quick to produce the vaccine, and different governments are really quick in giving the emergency licence to the vaccine, which makes the whole thing really sceptical. Why is the vaccine being pushed out so quickly? These vaccines are not produced for charity, but they are produced and sold for money. The early bird gets the worm. (P27).

4.1.4.2. Perceived strength of traditional Chinese medicine in disease prevention. To the participants, complementary and alternative medicine such as traditional Chinese medicine offers another option and makes more sense to them in terms of disease prevention. It was not uncommon for the participants to circulate information about traditional Chinese medicine in preventing COVID-19 through their social network and social media.

Although my training is Western-based, I still believe in Chinese medicine more when talking about disease prevention. My colleagues also believe in Chinese medicine more when talking about preventing COVID. My colleagues and I often 'happy share' [Cantonese slang for sharing information happily] about these Chinese medicine remedies. I feel more comfortable with Chinese medicine in COVID prevention because it is more natural and harmless. (P17).

The lack of commercial motives in traditional Chinese medicine, according to the perceptions of the participants, also reinforced their higher trust in it.

To me, Chinese medicine is more trustworthy than vaccine, because Chinese medicine companies have never sold their herbs at high price in the

pandemic. Some Chinese medicine companies even donate the herbs that are efficacious against COVID to the community. This is really a big contrast from those vaccine companies that are selling the vaccines at high price to different places. (P30).

4.2. Theme 2: struggles the participants faced when not getting vaccinated

The participants commonly experienced moral struggles regarding their decision to not get vaccinated, primarily originating from their healthcare background. They perceived their refusal of vaccination as violating the social norms and the social expectations for healthcare providers, regardless of their social network, workplace, or personal beliefs. Table 2 illustrates the number of participants experiencing the struggles that are discussed in detail below.

4.2.1. Stigma in the workplace

Although receiving a COVID-19 vaccination was not mandatory in most of the participants' workplaces, all indicated that there was a strong expectation from management for the staff to get vaccinated, and they all encountered pressure from management for their non-vaccinated status. It was common for the participants to face blame from management and their colleagues if an outbreak occurred in the wards.

The hospital management does not make receiving COVID vaccination mandatory for staff at this moment. However, your justification of not getting vaccinated has to be very strong, and your supervisors would keep pushing you. Also, some vaccinated colleagues would gossip about you. Of course, the weekly mandatory virus testing would make unvaccinated staff feel very undesirable, but the worst experience is that you would be targeted for blame if there is an outbreak on your team or in your ward – you would be held responsible because you are not vaccinated. (P18).

4.2.2. Moral struggles as a nursing care provider

Almost all the participants experienced shame for not getting vaccinated because of their roles as nursing care providers. In many cases, the participants experienced a moral struggle when facing their patients: they wanted to share what they thought about the vaccine with their patients, but they also felt conflicted because what they thought about the vaccine went against the social expectations assumed of a healthcare provider.

'Can I still serve as a good role model for my patients?'

The first moral struggle that the participants experienced was doubt regarding whether they were able to serve as good role models for their patients. As nurses, the participants recognised that their job was to encourage their patients to perform disease prevention by receiving the vaccination. However, the participants were experiencing an emotional struggle since they did not get vaccinated themselves, therefore failing to serve as good models for their patients.

I feel rather conflicted. When patients come to me and ask for an opinion about the COVID vaccine, I would tell them, yes, you should get vaccinated. As a nurse, this is what I should do in my job and for my patients. However, I myself do not [get vaccinated]. I feel bad because I lied to my patients, though my patients would never know I was lying to them. Can I still serve as a good model for my patients? (P25).

'Am I being ethical to my patients?'

Table 2
Frequency of participants mentioning experiences of struggle for not getting vaccinated (Note: total number of participants, $n = 35$).

Themes	Sub-themes	Frequency n (%)
Stigma in the workplace		35 (100)
Moral struggles as a nursing care provider	'Can I still serve as a good role model for my patients?'	33 (94)
	'Am I being ethical to my patients?'	31 (89)
	'I don't want to lie to my patients'	16 (46)

The second moral struggle concerned whether they were being ethical to their patients. As nurses, the participants were aware that they could protect their patients from becoming infected if they received the vaccine. Their failure to get vaccinated made the participants worry about if they would become a virus spreader to their patients.

I agree that my risk of getting infected would be higher than other vaccinated staff. If I carry the virus, I would infect my patients. I think I may blame myself if I make my patients even sicker by getting infected. The patients should assume that we as healthcare providers should have received the vaccination early on. How would my patients feel if I told them that I am still unvaccinated? Will they be afraid of me? Will they refuse my care? If my patients get infected, will they blame me for having passed on the virus to them? Am I being ethical to my patients? (P26).

'I don't want to lie to my patients'

Almost half of the participants had a feeling of being immoral regarding their patients, as they had lied to their patients about the vaccine.

Many patients asked me if it is good to get the COVID vaccine. I would lie to them, yes, because I cannot tell my patients my real feeling. I feel bad for deceiving my patients, but you can never know what your patients would do if they know that you are unvaccinated. They may complain about me. (P14).

Some participants had lied to their patients, indicating that they had been vaccinated.

You know, many patients do not want to come to hospital for follow-up because of COVID, but they cannot stop their treatment. To make my patients feel more comfortable with our care, I would lie to them that we have all been vaccinated. I don't want to lie to my patients, but it is the only way that can help them to feel at ease coming back for follow-up. (P22).

5. Discussion

Brewer's Increasing Vaccination Model [25] and the World Health Organization's Behavioural and Social Drivers of Vaccination Framework [26] both point to the importance of social processes in people's vaccination uptake. Such processes, which involve socialisation through social norms and social networks in Little's [30] terms, work with different social and cultural forces related to what people think and feel about the risk and effectiveness of vaccines [25]. Expanding these two vaccination models, this study adopts the CMA framework to systematically investigate the complex and interacting social and cultural forces according to the four social levels of the micro- and macro-social structures, which socialised the nurse participants to not get vaccinated against COVID-19. According to the CMA framework, the interacting political and economic forces embedded in a capitalist system is a crucial foundation for health issues, and they can affect human relationships, collective experiences, and social behaviours in health [38]. Vaccination behaviour should thus be seen as a product originating from these intertwining forces. These forces could be considered as key socialisation agents for the nurse participants, constituting the social norms that contributed to their lack of immunisation.

The participants' lack of confidence and worries about vaccine safety at the individual level were embedded in the relationship among: (1) the information – usually negative – shared among their healthcare colleagues and non-healthcare personnel through social media platforms at both the individual and micro-social levels, (2) the resistance against government and workplace vaccination policies at the intermediate-social level, (3) their distrust of the profit-oriented nature and capitalist operation of the vaccine at the macro-social level, and (4) their cultural confidence in the efficacy and conscience (non-profit oriented) of traditional Chinese medicine against COVID-19 infection at the macro-social level. These four aspects, which served as the social norms for the participants, interacted; they are the agents of socialisation involving significant others in contributing to the participants' non-vaccination status.

Consistent with Ahmad et al. [58], this study shows that trust in a vaccine played an important role for the nurse participants in deciding

whether to receive the COVID-19 vaccine. The participants exhibited low trust in the vaccine at the individual level, resulting from their interaction with the social norms at both the individual and micro-social levels. The participants obtained information about the vaccine's side effects from their significant others, such as family members and healthcare colleagues in their social network at the individual level. They also received information from social media sharing the vaccine experiences of other healthcare personnel at the micro-social level. Together, these served as social norms for the participants, socialising them further to have low trust in the vaccine. This echoes the international literature showing that the significant others have a significant impact in affecting a person's vaccine confidence and motivation [59].

In addition to the social norms at the individual and micro-social levels, the low trust of participants and their significant others in the vaccine was largely embedded in their distrust of the capitalist operation behind the vaccine production at the macro-social level, serving as the foundation of their vaccination refusal. The vaccine was perceived as having a strong commercial and profit-oriented motive. Indeed, literature has shown that the vaccine industry's profit motive has eroded people's trust in vaccination [60]. This observation was confirmed by Hall [61], showing that people's scepticism towards health organisations increased when medicine and healthcare demonstrate profit-related attributes. This explains why traditional Chinese medicine became more trustworthy for the participants; it was perceived as altruistic, with little profit concern. The credibility of medicine and science are undermined when they are connected with commerce and profit motives. The resulting scepticism is not only seen from the general public but is also recognised as common among healthcare workers [58]. The perceived close relationship between vaccination and profit undermines the trust of the participants and their significant others, and it has also become a social norm for them. Sharing the belief with their significant others reinforced the participants' distrust towards the vaccine through socialisation. When the information that the participants received from their social networks at the individual and micro-social levels was consistent with their beliefs, this became their social norm, making the (mis)conception of the vaccine become more credible and real.

Political distrust of the government at the intermediate-social level was another underlying factor for the participants not getting vaccinated. This is consistent with Albrecht [40], who shows that Americans' political views and their level of satisfaction with the government are strong predictors for COVID-19 vaccine acceptance; vaccination rates were much lower in counties with a high percentage of Republican voters. Canwat [62] similarly found that people's vaccine acceptance was affected by the political implications of COVID-19, as governments in East Africa had made use of infection control measures to pursue their particular political interests.

Social media was another significant other for the participants, serving to socialise their attitudes towards the vaccine. For the participants, negative information about the vaccine was mostly shared among fellow healthcare workers through social media platforms. Their scepticism in relation to the vaccine's perceived correlation with profit-making business was reinforced by the information that they received from social media. To the participants, social media was perceived as more trustworthy than medical experts due to the perceived absence of conflicting commercial and profit-oriented interests. The vaccine's side effects, as witnessed by those on social media, were well matched with their own perceptions. This also became a social norm for the participants, serving to socialise their distrust of the vaccine. Their trust in the information from their social networks and from social media thus correlated with their lack of confidence in the vaccine. This finding aligns with studies showing how social media is significantly affects vaccination intention in different cultures [63–65] and is widely used to disseminate anti-vaccine messages, thus discouraging vaccination [66,67]. A systematic review [68] shows that higher dependence on information obtained from social media can contribute to lower vaccination intention, which may be explained by the dominance of vaccine hesitancy topics on social media. Social media also served as an important platform for the participants to exchange information about workplace COVID-19 vaccination policies with their colleagues. Such information exchange was a socialisation for the participants, reinforcing their refusal to get vaccinated. As a result, the participants – even though they are nurses – became less critical when encountering vaccine (mis)information on social media.

The participants commonly experienced stigmatisation and moral struggles resulting from their refusal to vaccinate. These aspects emerged, respectively, from their workplace and from their ethics towards patients. Indeed, nurses often see themselves as role models of healthy behaviour [69,70]. Past literature agrees that healthcare providers have an ethical duty to vaccinate for the sake of public health [71–73]. Neiman [74] also argues that nurses have moral obligations to serve as role models regarding pandemic precautions. As nurses, the participants widely believed that they had the responsibility to encourage their patients to get vaccinated and had the obligation to get vaccinated themselves. However, their worries about the vaccine and their non-vaccinated status caught them in a moral struggle, as they perceived themselves as violating the social expectations for healthcare providers. Meanwhile, a few participants believed that being pushed to get vaccinated is a form of moral blackmail that could make them lose their health autonomy, showing their resistance against the social expectations for them as vaccination advocators. This is consistent with the finding by Carpenter et al. [51] that unvaccinated nurses in West Virginia commonly experienced stigmatisation and a sense of losing autonomy in making vaccination decisions during the pandemic.

By adopting the CMA framework, this study thus reveals the nurse participants' reasons for not getting vaccinated at both a micro and macro level. The results are based on nurse participants who did not get vaccinated; their vaccination perceptions/concerns and their behaviour towards other vaccine-preventable infectious diseases before the COVID-19 pandemic were not investigated. Therefore, although the results suggest that the participants' non-vaccination was associated with those factors at four social levels, the link is not meant to be causal. Rather, the findings emphasise that social networks and perceptions are formed over many years and can inform people's health decisions.

5.1. Limitations

The findings of this study should be interpreted with caution, as the participants were sampled in a Chinese context, and their experiences were influenced by the social and cultural context of Hong Kong. Although CMA has an anthropological origin, it was not possible to stay close with the participants and conduct face-to-face interviews during the study period in the pandemic. Sampling using two Facebook pages and interviews conducted online might also have introduced bias to the findings, as vaccine-hesitant nurses who are not active on social media and/or not familiar with online meeting platforms might have different social behavioural drivers of not getting vaccinated compared to those of such nurses who are active on social media. Future research involving a larger sample size and more study sites would increase the reliability of the findings.

6. Conclusion

Adopting a critical medical anthropology framework, this study expands Brewer's Increasing Vaccination Model [25] and the World Health Organization's Behavioural and Social Drivers of Vaccination Framework [26]. The nurses' refusal to vaccinate should be understood as a social process, involving socialisation from complex social and cultural forces according to the four social levels at both the micro- and macro-social structures of the CMA framework. The participants' lack of confidence and worries about vaccine safety at the individual level were in an intertwined relationship with the negative information shared

among their healthcare colleagues and non-healthcare personnel through social media platforms at both the individual and micro-social levels; their resistance towards vaccination policy at the intermediate-social level; and their distrust of the vaccine's capitalist profit-oriented operation and their cultural confidence in traditional Chinese medicine at the macro-social level. More communication between hospital management and nurses regarding the organization's vaccination policy and avoidance of a top-down approach to enforcing vaccination may help reduce nurses' resistance towards the vaccine. Indeed, past studies show that top-down approaches to vaccination campaigns have done little to address vaccine hesitancy [75]. Instead, a bottom-up approach involving a shared partnership with the community is a possible way to rebuild people's trust in the vaccine [76]. To tackle the distrust in relation to the perceived profit-oriented nature of the vaccine, the health authorities should emphasise neutrality when encouraging vaccination, emphasising that it is based solely on medical and public health facts, without commercial interference.

CRediT authorship contribution statement

Judy Yuen-man Siu: Writing – review & editing, Writing – original draft, Validation, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Consent for publication

Informed consent of research data publication with anonymity was obtained from all participants.

Ethics approval and consent to participate

Ethics approval was obtained from the Human Subjects Ethics Subcommittee of the Hong Kong Polytechnic University before the start of the study (ID: HSEARS20200924003). Informed consent was obtained from all participants.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Interview question guide

*Probing questions are not listed.

1. How do you feel about COVID-19 vaccine? What is your impression on this vaccine?
2. Who are the ones getting vaccinated against COVID-19 in your social network? Have you ever had any discussion about the COVID-19 vaccine with them? What is the content of these discussions?
3. Who are the ones NOT getting vaccinated against COVID-19 in your social network? Have you ever had any discussion about the COVID-19 vaccine with them? What is the content of these discussions?
4. In your nursing profession, is getting vaccinated / or not getting vaccinated a trend among your nursing colleagues? How does this trend affect your decision of not getting vaccinated?
5. How would you comment about the trend of getting vaccinated / or not getting vaccinated among your colleagues in other healthcare disciplines? How does this trend affect your decision of not getting vaccinated?
6. How would you comment about the standpoint of your colleagues in the COVID-19 vaccination? How would their standpoints affect your decision of not getting vaccinated?
7. How would you comment about the standpoint of your supervisors / ward / department / hospital in COVID-19 vaccination? How would their standpoints affect your decision of not getting vaccinated?
8. What are the reasons for you not getting vaccinated?
9. Did you feel any pressure from not getting vaccinated? Can you share with me about some examples of these pressures?

Data availability

Data will be made available on request.

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