Barriers and facilitators to COVID-19 vaccine acceptability among people incarcerated in Canadian federal prisons: A qualitative study

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A B S T R A C T

Introduction: Canadian correctional institutions have been prioritized for COVID-19 vaccination given the multiple outbreaks that have occurred since the start of the pandemic. Given historically low vaccine uptake, we aimed to explore barriers and facilitators to COVID-19 vaccination acceptability among people incarcerated in federal prisons.

Methods: Three federal prisons in Quebec, Ontario, and British Columbia (Canada) were chosen based on previously low influenza vaccine uptake among those incarcerated. Using a qualitative design, semi-structured interviews were conducted with a diverse sample (gender, age, and ethnicity) of incarcerated people. An inductive-deductive analysis of audio-recorded interview transcripts was conducted to identify and categorize barriers and facilitators within the Theoretical Domains Framework (TDF).

Results: From March 22–29, 2021, a total of 15 participants (n = 5 per site; n = 5 women; median age = 43 years) were interviewed, including five First Nations people and six people from other minority groups. Eleven (73%) expressed a desire to receive a COVID-19 vaccine, including two who previously refused influenza vaccination. We identified five thematic barriers across three TDF domains: social influences (receiving strict recommendations, believing in conspiracies to harm), beliefs about consequences (believing that infection control measures will not be fully lifted, concerns with vaccine-related side effects), and knowledge (lack of vaccine-specific information), and eight thematic facilitators across five TDF domains: environmental context and resources (perceiving correctional employees as sources of outbreaks, perceiving challenges to prevention measures), social influences (receiving recommendations from trusted individuals), beliefs about consequences (seeking individual and collective protection, believing in a collective “return to normal”, believing in individual privileges), knowledge (reassurance about vaccine outcomes), and emotions (having experienced COVID-19-related stress).

Conclusions: Lack of information and misinformation were important barriers to COVID-19 vaccine acceptability among people incarcerated in Canadian federal prisons. This suggests that educational interventions, delivered by trusted health care providers, may improve COVID-19 vaccine uptake going forward.

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1. Introduction

During the first wave of the SARS-CoV-2 pandemic in Canada, an average of 30,000 adults were incarcerated in federal and provincial/territorial custody each day [1]. It is well recognized that prisons are high-risk settings for the transmission of infectious diseases due to challenges in screening and contact tracing [2], health communication [3], physical distancing, and the implementation of effective infection prevention and control measures [4]. Consequently, there have been concerning COVID-19 outbreaks in correctional settings worldwide [5], including in Canada [6-8]. Given the disproportionate incarceration of people experiencing social and health inequities, COVID-19 mortality rates in correctional institutions have been found to be several-fold higher than surrounding communities [5,9]. Furthermore, ethnocultural minority groups have been severely impacted by COVID-19 [10], many of whom are disproportionately incarcerated [11,12]. Several measures have been implemented to prevent the introduction and spread of SARS-CoV-2 in Canadian correctional facilities including decarceration, the restrictions of visitors, the cessation of inter-institutional transfers and staff cross-deployment, testing and contact tracing, and the introduction of mandatory quarantines upon admission [1,5]. Despite these measures, SARS-CoV-2 outbreaks have continued to occur, underscoring the importance of COVID-19 vaccination in correctional facilities.

In December 2020, the Canadian National Advisory Committee on Immunization prioritized “resident and staff of congregate settings”, such as correctional facilities, for early COVID-19 vaccination [13]. Despite the availability and promotion of routine vaccination in many correctional settings since the 1990s, vaccine uptake rates have remained historically low [14]. For example, influenza vaccination rates of people incarcerated in federal prisons on any given day between January and March 2021 ranged from 35 to 40% [15], with similarly low vaccine rates (36–46%) observed in the United States and the Australian criminal justice systems in previous years [3,14]. COVID-19 vaccine uptake in correctional institutions needs to reach much higher levels in order to mitigate the potential morbidity and mortality that COVID-19 outbreaks can cause [16].

According to the “5Cs” model, vaccine acceptability is influenced by confidence (trust in vaccine efficacy and safety, and in the system that delivers it), constraints (structural and psychological barriers), complacency (when a vaccine-preventable disease is not perceived as high risk), calculation (engagement in extensive information searching), and collective responsibility (a willingness to protect others) [17]. When applied to the Canadian correctional system, in the context of an aging and comorbid incarcerated Canadian population [16], and where resources and the infrastructure exist for vaccine delivery [18], “constraints” are unlikely to play a major role in vaccine acceptability. Conversely, confidence and complacency, which are largely driven by knowledge and attitudes, and calculation and collective responsibility, may influence vaccine acceptability. In prison settings, several factors may influence a lack of confidence including medical mistrust due to systemic inequities and negative perceptions or experiences with the response of the health services sector vis-à-vis infection control measures [19-22]. A lack of confidence can compromise information-seeking, further exacerbating vaccine uptake [23,24]. Barriers and facilitators to COVID-19 vaccine acceptability among incarcerated populations have not yet been fully explored in the Canadian context. We thus aimed to explore determinants of COVID-19 vaccine acceptability among people incarcerated in the Canadian federal correctional system.

2. Methods

2.1. Study design and participants

We conducted a qualitative study in March 2021 with adults (18 years of age and older) incarcerated in one of three federal correctional facilities, where people with sentences of two years or more are housed. In order to participate, individuals had to provide verbal consent in English or French. Those who had previously received a COVID-19 vaccine (first available to highest-risk inmates on January 8, 2021) were excluded; these individuals represent approximately 5% of the incarcerated federal population [25]. The sites were chosen in consultation with Correctional Service Canada (CSC) and represented the sites with historically low influenza vaccine uptake. Participants were recruited from Matsqui Institution (MI; British Columbia), Grand Valley Institution for Women (GVIW; Ontario), and Federal Training Centre (FTC; Quebec). MI houses 313 men in minimum- and medium-security. Over one-third (112; 36%) are Indigenous and one-fifth (65; 20%) are from diverse minority groups (Asian, Black, Hispanic, and other). GVIW houses 169 incarcerated women in minimum-, medium-, and maximum-security levels. Approximately one-third (53; 31%) are Indigenous and one-quarter (42; 25%) are from other minority groups. FTC is made up of a minimum-security wing, and a ‘multi’ minimum- and medium-security wing with a total of 420 incarcerated men. Overall, less than one-fifth are Indigenous (70; 17%) or from other minority groups (57; 14%). Both GVIW (March/April 2020) and FTC (April/May 2020 for the multi wing, and January/February 2021 for the minimum-security wing) were sites of prior COVID-19 outbreaks; eight and 163 individuals tested positive, respectively. One person died of COVID-19 at FTC.

In order to reflect the population incarcerated at each site, quota sampling, a non-probability, flexible sampling approach that ensures representation of key groups by recruiting a minimum number of participants presenting with specific characteristics [26], was used to select participants. More specifically, we used age (<35, 35–44, 45–54, 55–64, ≥65 years), ethnicity (Caucasian, Indigenous (First Nations, Inuit, and Metis), Asian, Black, Hispanic, and other), and security level (minimum, medium, and maximum) as criteria for quota sampling. The study was approved by the McGill University Health Centre Research Ethics Board (REB # 2021-7547).

2.2. Theoretical framework

This study was informed by the Theoretical Domains Framework (TDF). The TDF includes 14 domains to explain how individuals’, communities’, or populations’ decisions are shaped by past and present experiences, resources, and restrictions. These domains are categorized into three constructs: capability (knowledge, skills, behaviour regulation, memory and attention, decision-making), opportunity (environmental context and resources, social influences), and motivation (goals, social/professional role/identity, beliefs about capabilities, beliefs about consequences, optimism, reinforcement, emotions) [27]. While the TDF provides a lens to examine possible cognitive, affective, social, and environmental influences, it does not explain or infer causality about the determinants of a given behaviour. Rather, these constructs are primarily used in exploratory qualitative research to identify barriers and facilitators key to the implementation of interventions in diverse contexts for behavioural changes [27-29].

2.3. Data collection

We conducted semi-structured interviews via telephone or online videoconferencing in French or English. Interviews were
Baseline characteristics of study participants.

Table 1 describes the baseline characteristics of the participants, including self-reported influenza vaccine uptake in prison (ever) and prior COVID-19 diagnosis. Only one participant had previously had COVID-19. Among the 15 participants, 11 (73%) expressed a desire to receive a COVID-19 vaccine, including two participants who had previously refused influenza vaccination. Among the four participants who mentioned not wanting a COVID-19 vaccine, all had previously refused influenza vaccination. Three belonged to an ethnocultural minority group. The thematic analysis identified a total of thirteen themes related to barriers and facilitators to COVID-19 vaccine acceptability.

3.1. Barriers to vaccine acceptability

Barriers to COVID-19 vaccine acceptability were distributed across three TDF domains – social influences, beliefs about consequences, and knowledge – encompassing five themes. Table 2 presents illustrative quotations for each theme.

3.1.1. Social influences

a. Receiving strict recommendations

Participants mentioned that they were less likely to follow health-related recommendations, including recommendations to receive a COVID-19 vaccine, if these recommendations were given in a strict or rigid manner and with no alternatives provided. While almost all participants reported believing they would be given the choice to accept or decline a COVID-19 vaccine, a few mentioned that they expected to be pressured if they expressed hesitancy, which made one participant more reluctant to agree to be vaccinated.

b. Believing in conspiracies to harm

Participants mentioned beliefs that the COVID-19 vaccines were part of a conspiracy to harm people. Participants were concerned that, because of a history of corruption, Canadian prisons could be the recipients of expired or harmful vaccines (e.g., associated with thromboembolic events, or ‘blood clots’) that were rejected by other countries or institutions. Another participant believed that the COVID-19 vaccines were created to reduce the world population, while others mentioned rumours that the vaccines were part of a conspiracy to “plant microchips” in people.

3.1.2. Beliefs about consequences

a. Believing that infection prevention and control measures will not be fully lifted despite vaccination

Participants believed that, despite vaccination, infection prevention and control measures such as such as handwashing, sanitization of shared objects (e.g., coffee machines, door handles, telephones, etc.), wearing of personal protective equipment (e.g., masks), and physical distancing would not be fully lifted. Participants also questioned whether a “return to normal” would be possible following vaccination. These beliefs were motivated by the perception that the COVID-19 vaccines failed to prevent transmission and only served to prevent severe symptoms.

b. Being concerned with the risk of side effects or getting sick because of the vaccine

Approximately one hour in duration and were audio-recorded. The interview schedule included questions on socio-demographics (age, ethnocultural background, duration of incarceration) and open-ended questions on three different topics: 1) Experiences with health care services and vaccination in prison; 2) Knowledge, perceptions, and experience of COVID-19; and 3) Knowledge and perceptions of the COVID-19 vaccines, including perceived risks and benefits, concerns, and fears. The interview guide was developed using the Acceptability Matrix of the Ethics, Equity, Feasibility, and Acceptability (EEFA) Framework (Supplementary Material, Appendix A) [30]. This Framework outlines several scientific and programmatic factors that are considered important by decision-makers when evaluating immunization programs.

2.4. Data analysis

Interview recordings were transcribed using the Dovetail application (https://dovetailapp.com/). Transcriptions were then revised and de-nominalized by HP (interviews in English) and DL (interviews in French). DL conducted an inductive-deductive thematic analysis of the transcriptions using the NVivo 12.0 software (Melbourne, Australia). DL inductively coded and categorized participants’ answers to the three topics. To ensure reliability, this first codification was discussed with DOP, adjusted, and discussed with DOP, HJ, and NK. The content of each resulting code was then classified into barriers and facilitators to COVID-19 vaccine acceptability and categorized within TDF constructs. Results and interpretations were then discussed with co-authors.

3. Results

From March 22–29, 2021, a total of 15 participants (n = 5 per site; n = 5 women; median age = 43 years old) were interviewed, including five First Nations people and six people from other ethnocultural minority groups. Table 1 describes the baseline characteristics of the participants, including self-reported influenza vaccine uptake in prison (ever) and prior COVID-19 diagnosis. Only one participant had previously had COVID-19. Among the 15 participants, 11 (73%) expressed a desire to receive a COVID-19 vaccine, including two participants who had previously refused influenza vaccination. Among the four participants who mentioned not wanting a COVID-19 vaccine, all had previously refused influenza vaccination. Three belonged to an ethnocultural minority group. The thematic analysis identified a total of thirteen themes related to barriers and facilitators to COVID-19 vaccine acceptability.

Table 1

| Participant number | Age range | Self-reported ethnocultural background | Self-reported prior COVID-19 diagnosis | Self-reported uptake of influenza vaccine in prison (ever) | Expressed desire to receive the COVID-19 vaccine |
|--------------------|-----------|----------------------------------------|---------------------------------------|----------------------------------------------------------|---------------------------------------------|
| 1                  | 45–54     | First Nations                          | No                                    | No*                                                      | Yes                                         |
| 2                  | 35–44     | White                                  | No                                    | No                                                       | Yes                                         |
| 3                  | 45–54     | Black                                  | No                                    | No                                                       | Yes                                         |
| 4                  | 35–44     | White                                  | No                                    | No                                                       | Yes                                         |
| 5                  | <35       | First Nations                          | No                                    | No                                                       | No                                          |
| 6                  | <35       | Black                                  | No                                    | Yes                                                      | Yes                                         |
| 7                  | 45–54     | First Nations                          | No                                    | Yes                                                      | Yes                                         |
| 8                  | 55–64     | White                                  | No                                    | Yes                                                      | Yes                                         |
| 9                  | 35–44     | First Nations                          | No                                    | No*                                                      | No                                          |
| 10                 | <35       | White                                  | No                                    | No                                                       | No                                          |
| 11                 | <35       | Hispanic                               | No                                    | No                                                       | Yes                                         |
| 12                 | 55–64     | Black                                  | No                                    | No                                                       | No                                          |
| 13                 | 45–54     | Inuit                                  | No                                    | No                                                       | Yes                                         |
| 14                 | 45–54     | Asian                                  | Yes                                   | Yes                                                      | Yes                                         |
| 15                 | 45–54     | First Nations                          | No                                    | Yes                                                      | Yes                                         |

* Participant reported never having been offered an influenza vaccine in prison.
Table 2
Illustrative quotations for barriers to COVID-19 vaccine acceptability.

| Domain                | Theme                                      | Quotation (participant number)                                                                 |
|-----------------------|--------------------------------------------|------------------------------------------------------------------------------------------------|
| Social influences     | Receiving strict recommendations           | I probably wouldn’t agree with [any health-related recommendation] if I was being told that was what was best for me. If somebody is being very strict or rigid about the way that those things are being communicated, then communication is huge. […] I guess if [the COVID-19 vaccine] ever became mandatory, where people had to do it, that would then take away my power to choose. If that ever happened that would be a factor for not getting it. (5) |
| Believing in conspiracies to harm |                                           | There’s a tremendous pressure to accept the vaccine, coming from not only the staff and other inmates, but management as well, because they want to get everything back under normal functionality. I feel that we came to prison because we don’t like people telling us what to do in the first place. So when you tell me to do something, my automatic reaction is to say no. (10) |
| Belief about consequences | Believing that infection prevention and control measures will not be fully lifted despite vaccination | I know some countries did not want the type of vaccine that we’re going to be getting as inmates. It’s kind of alarming that it’s not good enough for some countries, but it’s okay for Canadian prison population. (4) |
| Belief about consequences | Being concerned with risk of side effects or getting sick because of the vaccine | There are a lot of conspiracy theorists in here and they wouldn’t even bother reading about [the COVID-19 vaccine]. They see it on the news and they go: ‘Ah, that’s just phony, the government is up to something and all the others are trying to inject us with some microchip or something.’ It’s ridiculous stuff that I hear in here. (8) |
| Knowledge             | Lacking information on the vaccine         | [Other prisoners] said that [governments or authorities] were only giving [the COVID-19 vaccine] to kill people off, to reduce the population in the world. (9) |
| Knowledge             | Lacking information on the vaccine         | The vaccine is not going to protect me a hundred percent, right? Why is it then I would take it if I would still have to be just as cautious as I am now about washing and distancing and wearing your masks, etcetera? (1) |
| Knowledge             | Lacking information on the vaccine         | [The COVID-19 vaccine] is not really for me. It’s just not knowing whether we will be able to go into the population. Will we be free, like walking around without a mask on and talking and whatever else? Being sharing stuff with other people, playing cards and whatever else? It’s kind of depressing. (9) |
| Knowledge             | Lacking information on the vaccine         | Now that I’m contaminant-free, I’m more aware, I’m more balanced. I’m better out of drugs. [Concerning the COVID-19 vaccine], why play with fire? There’s nothing wrong with me. So why fix something that ain’t broken? (9) |
| Knowledge             | Lacking information on the vaccine         | It was such a short testing period for the vaccine. So we don’t really know if there will be side effects from the vaccine itself. These are my doubts about the vaccine. (7) |
| Knowledge             | Lacking information on the vaccine         | And I heard a lot of bad things about [the COVID-19 vaccine]. There are some side effects to certain kinds of vaccines and blood clots. Stuff like that really worries me and I know it worries other people too. (14) |
| Knowledge             | Lacking information on the vaccine         | I worry that I’m going to get sick from [the COVID-19 vaccine]. They say the flu shot has formaldehyde in it. I don’t know if formaldehyde is bad to be ingested in small amounts, but I know that we put formaldehyde in dead bodies. So why would I want it in my healthy body? The flu shot can make you sick. I don’t know if that’s being said about the COVID vaccine, but I wouldn’t mind hearing about the reality and the truth of them. (4) |
| Knowledge             | Lacking information on the vaccine         | [The information on the vaccine] is not disseminated. It’s not packaged properly. And the way that things are in prisons, we hardly receive any information at all. […] I still trust in the science and in public health, but my trust hasn’t been waned and waned a lot because of what’s been going on. (10) |
| Knowledge             | Lacking information on the vaccine         | If there were more facts and more information about where vaccines come from, what methods were used to deem them safe […] and what kinds of people the vaccines were tested on, because people have different immune systems. I think everybody needs to be a little more educated about these things. […] I’m just a little bit skeptic with regards to vaccines, especially if I don’t have a high level of information about them. (5) |

All participants were concerned about possible COVID-19 vaccine-related side effects, including short-term discomfort, severe complications, or long-term vaccine-induced sequelae. The risk of severe side effects was identified as an important barrier for several participants who felt protected against severe COVID-19 or its related complications due to physical strength, a healthy lifestyle, religious faith, or having had a parent who survived a similar infection in the past. Participants expressed not wanting to receive the vaccine because they believed that the risk of side effects or complications exceeded the vaccine’s individual protective benefits. Participants were reluctant to accept a COVID-19 vaccine because they were concerned it may contain toxic elements present in influenza vaccines or parts of the SARS-CoV-2 virus, both of which could make them sick. For almost half of participants, concerns about the long-term complications were heightened by the perception that the COVID-19 vaccines were developed and distributed too quickly, potentially compromising the quality of the vaccines, the generalizability of clinical studies, and the overall knowledge of long-term complications (such as infertility). Participants from ethnocultural minority groups were also concerned that they were underrepresented in clinical trials and thus feared side effects that would have been underreported in clinical trials.
3.1.3. Knowledge
   a. Lacking information on the vaccine

   All participants reported existing COVID-19 vaccine information in prison as minimal, incomplete, or inadequately tailored to the needs of incarcerated people. Information regarding the COVID-19 vaccines was obtained from many sources including television, pamphlets, and conversations with or presentations by health care professionals. Despite this, several mentioned that the information was insufficient, and that this lack of information could contribute to vaccine hesitancy among incarcerated people. Participants identified a need for additional information vis-à-vis vaccine efficacy, side effects, and duration of protection. A few participants desired more information about the impact and management of SARS-CoV-2 outbreaks in prisons, and the expected effect of vaccination programs on the mitigation of outbreaks in correctional facilities. While additional information was desired, the majority of those who expressed not wanting the vaccine felt that more information would not change their decisions.

3.2. Facilitators to vaccine acceptability

   Facilitators to COVID-19 vaccine acceptability were distributed across five domains – environmental context and resources, social influences, beliefs about consequences, knowledge, and emotions – encompassing eight themes. Table 3 presents illustrative quotations for each theme.

3.2.1. Environmental context and resources
   a. Perceiving correctional employees as the sources of COVID-19 outbreaks in prisons

   While two-thirds of participants considered correctional settings to be low-to-moderate risk for COVID-19 outbreaks given their isolation from surrounding communities, all believed that correctional employees were the sources of these outbreaks given their daily movement in and out of prison. They considered vaccination a means to increase their sense of control in a situation where their perceived safety depended on the behaviours of others. The perception that their safety was contingent on others was associated with a heightened desire to protect themselves through vaccination.
   b. Perceiving challenges related to prevention measures in prison

   While all participants favoured the implementation of infection prevention and control measures, they underscored several environmental challenges that jeopardized their abilities to abide with preventive measures in prison. These include difficulties in complying with physical distancing and the lack of reliable protective equipment (e.g., masks, hand sanitizer). Participants also reported that the close physical proximity between people in prison, the constant sharing of objects (e.g., telephones, door handles) and spaces (e.g., cafeteria, bathrooms), and the disproportionate presence of people who may struggle to apply preventive measures (e.g., people with mental illness or who use drugs) reduced the benefits of the measures that were put in place. Consequent to these challenges, participants expressed feeling increasingly susceptible to SARS-CoV-2 in prison settings, fueling their desire to receive a COVID-19 vaccine.

3.2.2. Social influences
   a. Receiving recommendations from trusted individuals

   Participants were more likely to follow health-related recommendations from health care professionals with whom they had had positive previous personal experiences, and who they perceived as trustworthy, having good interpersonal skills (e.g., supportive, non-judgmental, friendly, or attentive), and proactive (e.g., anticipating needs, solving problems). All participants reported that they tried to follow recommendations, particularly if they were well-explained. Other participants mentioned family members as trusted individuals who influenced their decisions to follow health recommendations, including COVID-19 vaccination.

3.2.3. Beliefs about consequences
   a. Seeking both individual and collective protection against severe COVID-19

   Participants described COVID-19 as a disease whose severity varied from asymptomatic or mild to fatal. Participants perceived severe disease to be associated with several risk factors including increased age, sedentary lifestyle, obesity, presence of chronic health conditions (e.g., asthma, diabetes), or a weak immune system due to a poor diet or drug use. Most participants mentioned high vaccine efficacy in preventing severe COVID-19 and its complications as a facilitator to vaccine acceptability. The desire to reduce the risk of severe symptoms, complications, or sequelae related to COVID-19 through vaccination was particularly prominent among participants who self-identified as high risk due to comorbidities associated with increased COVID-related morbidity and mortality. With respect to collective protection, the majority of participants wanted a COVID-19 vaccine to reduce the risk of transmission (and subsequent complications and sequelae) to others and to ensure ongoing access to health care services by preventing COVID-19-related hospitalizations.
   b. Believing that COVID-19 vaccination will allow a collective “return to normal”

   Participants believed that infection prevention and control measures, such as restricted visitations, would be at least partially lifted for all when a sufficient proportion of incarcerated people and correctional employees were vaccinated. This belief was an important facilitator to vaccine acceptability for all participants. A participant, who expressed not wanting the vaccine, stated that they would accept it if they could be assured that it would end restrictions. Some participants expressed that a higher proportion of people in prison would need to be vaccinated compared to the general population to lift infection prevention and control measures, with one hypothesizing that this proportion would need to be 100%.
   c. Believing that there will be individual privileges for those who are vaccinated

   Approximately one-third of participants believed that only those who were vaccinated would receive individual privileges. These included access to certain prison-specific services (e.g., family visits, shared housing) or activities following their release (e.g., housing at a halfway house, air travel, entering stores), which were restricted or withdrawn during the pandemic. For participants, this belief was an incentive to vaccination.

3.2.4. Knowledge
   a. Reassurance about vaccine outcomes

   One-third of participants mentioned that witnessing the safe vaccination of others including family members and friends was reassuring and facilitated their decision to accept the vaccine. Similarly, seeing or hearing about good vaccine outcomes from peers, correctional employees, or family members who had received the vaccine, or equally, from the news, was a facilitator to vaccine acceptability. A participant stated that hearing about negative vaccine-related complications in the news could generate fear for some, but that a certain degree of side effects was expected given the millions of people who were being vaccinated around the world.

3.2.5. Emotions
   a. Having experienced COVID-19-related anxiety
Table 3: Illustrative quotations for facilitators to COVID-19 vaccine acceptability.

| Domain | Theme | Quotation (participant number) |
|--------|-------|-------------------------------|
| Environmental context and resources | Perceiving correctional employees as the sources of COVID-19 outbreaks in prisons | In this place, you got correctional staff and people that work here that are putting basically the inmates at risk because they leave the facility and they go home every day and live their lives. They're the reason that you can get the virus. So if we don't and they don't get vaccinated, then we would get a high risk of actually getting infected. (6) |
| Social influences | Receiving recommendations from trusted individuals | The COVID-19 vaccine could be good for us because staff members who come to work, and they are more at risk of bringing [COVID-19] here. So if we are vaccinated and they come in with it, we are protected. (15) |
| Beliefs about consequences | Seeking both individual and collective protection against severe COVID-19 | Because it's such a close-knit community and there's no real social distancing. It's hard to socially distance when you live in the same living unit with somebody. [COVID-19] would catch like wildfire. [The vaccine] would stop me from getting it, and would stop you from spreading it. So it would minimize the COVID-19 infected population. (2) |
| Beliefs about consequences | Believing that vaccination will allow a collective “return to normal” | We can try to socially distance, but there are certain places where we cannot keep our distances. When we are in our cells, we cannot stay two meters apart. […] We share the same bathroom, the same shower. Even if we clean up after the other, there's always a risk. To eat, we are all in the same cafeteria and we touch the plates. […] It is very important [that everybody in prison get vaccinated for COVID-19] because we are obliged to stick among ourselves. (11) |
| Beliefs about consequences | Believing that there will be individual privileges for those who are vaccinated | The benefits are that you'll have a vaccine, and the vaccine will help you fight the COVID virus and it would probably save your life. [The possibility of being infected with COVID-19 despite receiving the vaccine] doesn’t mean that it won’t save your life. […] Everybody should receive the vaccine. (14) |

Quotations are excerpts from participants discussing their reasons for accepting the COVID-19 vaccine.
Experiencing negative emotions like stress or fear related to the possibility of severe COVID-19 was a facilitator to vaccine acceptability. Being vaccinated was perceived by participants as a way to mitigate these emotions. Participants also associated infection prevention and control measures with negative emotions such as confusion, stress, irritability, and fear. It was felt that the lifting of these restrictive measures following the vaccination of a sufficient proportion of people living and working in prisons would allay these feelings.

4. Discussion

This qualitative study explored barriers and facilitators to COVID-19 vaccine acceptability among people incarcerated in three Canadian federal correctional institutions. Our sample, selected through quota sampling, included a range of different perspectives from diverse backgrounds to represent the population concerned. Our analysis identified five barriers associated with three domains of the TDF framework (social influences, belief about consequences, and knowledge) and eight facilitators associated with five TDF domains (social influences, belief about consequences, knowledge, environmental context and resources, and emotions). Interestingly, these domains parallel those in a COVID-19 vaccine hesitancy study in the general Canadian population [31], suggesting that similar behaviours may be key to address in the implementation of interventions to improve vaccine uptake. We also found that, while intention to get vaccinated was high (73%), there are several prevailing concerns that could be addressed to both increase acceptability among those still resistant, and to provide additional resources (and enhance confidence) among those willing but requiring additional reassurance.

Studies have indicated that previous vaccination, in particular with the influenza vaccine, may be a facilitator to COVID-19 vaccine acceptability [32,33]. While this theme was not extracted from our interviews, all participants who had previously accepted influenza vaccination expressed a desire for COVID-19 vaccination, suggesting that previous influenza vaccination may indeed act as a facilitator. Conversely, half of participants who were offered the influenza vaccine and who subsequently declined it, expressed interest in a COVID-19 vaccine. This difference in attitude between the influenza and the COVID-19 vaccines may be explained by the fact that vaccine hesitancy is not fixed and may change with shifting contexts or when a vaccine and its related information are offered multiple times [34,35]. It is evident from our study that the measures put into place during the SARS-CoV-2 pandemic were incomparable to those implemented during previous influenza seasons, and that these highly disruptive infection prevention and control measures altered the routine prison “context”, thereby potentially affecting vaccine acceptability.

According to our findings, COVID-19 vaccine acceptability in federal prisons is in part influenced by complacency. Complacency negatively affected vaccine acceptability for a minority of participants. These participants were predominantly below the age of 30 and self-described as “healthier” than their peers. In other words, participants who expressed not wanting a COVID-19 vaccine perceived themselves at relatively low risk of a severe SARS-CoV-2 infection. Other studies have confirmed similar findings; younger incarcerated people were less likely to accept a COVID-19 vaccine [33,34,36-39]. Conversely, older participants with concomitant comorbidities expressed a greater interest in vaccination, recognizing their heightened risk of severe disease. Our results also highlight that COVID-19 vaccine acceptability in Canadian federal prisons may be largely driven by confidence. In fact, confidence acted both as a barrier and a facilitator to vaccine acceptability. Interestingly, as a barrier, this lack of confidence was not due to concerns regarding vaccine efficacy, but primarily due to safety – that is, potential side effects and long-term complications. Furthermore, these safety concerns exceeded the protective benefits of vaccination against severe COVID-19 for some. Studies exploring vaccine hesitancy have found that minority or disadvantaged groups disproportionately perceive vaccines as potentially harmful [40], and that these perceptions are associated with experiences of systemic racism and historical inequalities [20,21], a phenomenon that is reflected in our study. Half of the participants who expressed not wanting the vaccine were from minority groups, and others expressed concerns for a potentially disproportionate incidence of side effects and complications among women, people with mental health conditions, and other disadvantaged groups. Conversely, “receiving recommendations from trusted individuals” – that is, having trust in the system that delivers vaccines, emerged as an important thematic facilitator to COVID-19 vaccine acceptability, with health care providers identified as trustworthy sources of information. This finding is consistent with a recent study in a U.S. correctional setting that demonstrated that vaccine acceptance was associated with trust in medical professionals [33]. This study also highlighted the importance of trusted sources of COVID-19 information (e.g., television and family/friends) in influencing vaccine COVID-19 acceptance.

We also found that COVID-19 vaccine acceptability among participants incarcerated in federal prison was in large part driven by

Table 3 (continued)

| Domain       | Theme                              | Quotation (participant number)                                                                                           |
|--------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Knowledge    | Reassurance about vaccine outcomes | We have to pay a flat rate to use the telephone. If instead of having to pay all this money out, we didn't have to pay our deduction. [...] Because I know some people in here that say they don't want to be vaccinated, but I think that that would persuade them maybe to do it. I think that would be just a really great incentive. (4) |
| Emotions     | Having experienced COVID-19-related stress | Some people had blood clots, if I'm not mistaken. From what we can see, comparitively, I think that at a moment, I heard that there were 24 cases in the world. Well, it's not a lot on the millions who got this vaccine. On the television or on the radio, it is good because they often explain and in that [newspaper title] there was page where they explain everything in detail. (15) |

...
a lack of information, thereby preventing engagement in extensive information searching (i.e., calculation). A lack of information, and moreover, tailored to the needs of those in prison, was an important theme that emerged from our study. Participants reported that COVID-19 vaccine information was insufficient and incomplete, and acknowledged that inadequate information could impact vaccine hesitancy. Previous studies in correctional facilities also demonstrated that people who fail to acknowledge the severity of the disease [39] or who have concerns regarding side effects and suboptimal vaccine efficacy [33] are more likely to decline COVID-19 vaccination. While providing adapted information will be key, addressing misinformation such as conspiracies to harm will be equally important as misinformation has been shown to be associated with reduced vaccination intent [41].

Complacency and confidence, as well as calculation, can be addressed with the provision of education. To varying degrees, all participants voiced skepticism and concerns regarding the COVID-19 vaccines, underscoring a need for additional and tailored information. Experts have argued that educational interventions will be key to reinforce trust in science-based interventions like vaccination [42,43], particularly as a result of the medical mistrust that emerged from disruptions caused by the COVID-19 pandemic. Furthermore, studies have confirmed that prison-based vaccination programs have the potential to increase vaccine uptake if partnered with education [44-46]. Based on our findings, to increase COVID-19 vaccine willingness, information regarding vaccine efficacy and effectiveness, short- and long-term side effects, and the implications of collective vaccination on the removal of restrictive measures could be explored. Nurses, as “trusted individuals”, could also be considered key to increasing COVID-19 vaccination rates in Canadian correctional settings. Finally, while the provision of education is an important first step, studies have shown modest improvements in vaccine uptake with education [47,48], underscoring that education will likely need to be paired with other interventions to achieve increased uptake. While alternative strategies (e.g., other providers such as peers, media or content) could be developed simultaneously and tailored to the needs of incarcerated people who express vaccine hesitancy [49,50], building trust with those incarcerated will be critical moving forward [51].

Collective responsibility emerged as an important, yet previously undocumented theme, on vaccine acceptability in correctional settings. Participants expressed concerns for others’ well-being, a desire to “end the crisis” through vaccination, and to protect each other by contributing to “herd immunity”. This willingness to protect others extended beyond the borders of participants’ own prison walls; they demonstrated a desire to better understand pandemic management in correctional institutions other than their own. This collective responsibility may be explained by the stronger sense of community that may have emerged as a result of increased anxiety, fear, and a sense of vulnerability that those incarcerated may have experienced during the COVID-19 pandemic, potentially exacerbated by deepened social divisions and mistrust between those living and working in prison [52]. Educational programs should thus be complemented with efforts to safeguard trusting relationships between health care professionals and incarcerated people, recognizing that there may be a greater divide post-pandemic.

There are limitations to our study. Firstly, a limited number of participants were included. However, we achieved data saturation, and our sampling method succeeded in including a diverse sample representative of the incarcerated population at each site, thereby capturing a range of perspectives which may serve as the foundation for future work. Further, we believe our results are transferable to other correctional facilities with similar characteristics to our study sites. Secondly, as with all qualitative studies, volunteer, sampling, and social desirability biases may have been introduced. While there are limitations, this study adds to the dearth of literature vis-à-vis COVID-19 vaccine hesitancy among people in prison [36]. By contrasting participants’ lived experiences and highlighting patterns across their opinions, this study provides empirically-grounded evidence for our understanding of COVID-19 vaccine acceptability and hesitancy for incarcerated individuals.

In conclusion, we identified key barriers and facilitators to COVID-19 vaccine acceptability among people incarcerated in Canadian federal prisons. In particular, a lack of confidence and information will be key to address, and education about COVID-19 vaccines, delivered by trusted health care providers, may improve COVID-19 vaccine uptake in correctional settings going forward.

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Declaration of Competing Interest

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jvacx.2022.100150.

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