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Understanding health needs of professional truck drivers to inform health services: a pre-implementation qualitative study in a Canadian Province

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Abstract

Objectives Long-haul truck drivers experience multiple challenges, including increased health risks. A large percentage of professional truck drivers (PTDs) suffer from numerous chronic physical health conditions such as obesity, hypertension, diabetes, heart disease, sleep disorders, etc.) as well as poor mental health and social challenges. Furthermore, this population experiences numerous barriers related to accessing health care services including primary care and resources to improve their health. PTDs living in rural and remote areas are at higher risk. The objective of this study is to understand the views of PTDs and the trucking industry on health and personalized healthcare interventions and services.

Methods In-depth semi-structured interviews were conducted with twenty-six individuals with contextual knowledge and experience in the trucking ecosystem, to better understand the needs, expectations, and preferences of PTDs based in New Brunswick (Canada), related to their health (physical, mental, and social). Analysis of the audiotape recording was conducted using thematic content analysis.

Results Three major themes emerged from the qualitative analysis describing PTDs' health needs, existing health and preventive services, as well as recommendations for personalized healthcare interventions and services to be implemented: (1) "My life as a trucker!" Understanding needs and challenges, (2) "Taking care of myself, do you think it is easy while you're on the road?" Describing drivers and motivators for better health, and (3) "Can you hear what we need?" Translating needs into recommendations for tailored health services and preventative services.

Conclusion A highly demanding work environment and lack of timely access to integrated primary care negatively affect PTDs' health. Results of this study shed light on how to tailor primary care to improve its responsiveness and adequacy to PTDs' needs and realities. PTDs-sensitive integrated services, including multicomponent interventions (health education, coaching for lifestyle changes, and social support), are still lacking within the New Brunswick health system.

Keywords Professional truck drivers, Qualitative method, Health needs, Health services

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Background

In Canada, the trucking industry is the backbone of domestic supply chains. Professional truck drivers (PTDs) play a key role in maintaining this supply chain. The Canadian Trucking Alliance launched an initiative during the COVID-19 pandemic named "Thank a Trucker", to recognize long-haul truck drivers for delivering essential products [1]. Although the trucking industry is vital for the economy and the distribution of diverse goods and products [2], PTDs often feel unappreciated and invisible in society [2] and perceive that they are not well-regarded in society [3].

Health and work-related risk factors among professional truck drivers

PTDs face significant risk factors that negatively affect their physical, mental, and social health [4, 5]. Their job requires them to sit for numerous hours at a time at irregular times, often disrupting basic needs such as sleep and physical activity [6]. In Canada, service hours are regulated by individual provinces and territories. In New Brunswick specifically, PTDs must not exceed 13 h of driving in a day and must take at least 8 consecutive hours off before driving again [7]. Canadian PTDs are older, less educated, have lower incomes, work more hours, have higher rates of cardiovascular disease and obesity, and are more likely to be sedentary, have smoking habits, drive when fatigued, and have unhealthy diets compared to the general population [8]. PTDs working conditions also create significant barriers related to healthy behaviors (i.e., healthy eating [4] and physical activity [9]), increasing their risks for developing chronic health conditions, such as type 2 diabetes and cardiovascular disease, compared to other occupations and the general population [6, 8]. Overall, the work environments of PTDs have physical, social, occupational, institutional, organizational, and governmental dimensions [10].

Access to health services and prevention programs by professional truck drivers

The trucking industry environments are not conducive to implementing healthy lifestyle behaviors [4], elevating the risk of developing diseases. Moreover, the challenges that PTDs faced during the pandemic were highly exacerbated and the majority experienced higher levels of stress and fatigue, leading them to engage in more unhealthy behaviors like physical inactivity, unbalanced diet, and smoking [2]. Health services are available to Canadian PTDs through Canada's publicly funded healthcare system [11], private health insurance (if they have access), and government-funded programs such as a free mental health service called Wellness Together Canada, which was available during the pandemic [12]. Although health services are available, PTDs experience accessibility challenges, including primary care services [13]. Studies have identified numerous barriers to accessing health care services, including financial barriers like the absence of private health insurance and unaffordable services [14–17]. Work-related barriers such as the inability to stop while on the road, lack of transportation to access facilities, and difficulties in scheduling appointments were also identified in the literature [18]. When accessing mental health services, PTDs tend to have a negative perception toward services and healthcare professionals and a lack of knowledge of the services available [16]. Challenges in accessibility have negative impacts such as perceived poor health by PTDs [17], low levels of health literacy, and low utilization of health services [18]. These results highlight the need to address systematic and personal barriers that PTDs face in accessing health care. In addition, PTDs have minimal access to resources to improve their health, such as fitness facilities, wellness programs, and healthy eating options [8, 14]. PTDs must rely on their own resources to implement healthy behaviors, which is difficult considering their working hours and restricted living space. A review examining wellness programs carried out in the past found that the programs were small and poor in quality [19, 20]. Moreover, recent research led in Ontario has called for a better understanding of PTDs' work environment, more occupational-tailored primary care professionals and alternate models of care, such as telemedicine and virtual care [21]. However, no studies to date explored the perspective of PTDs in New Brunswick, Canada.

Study objectives

The aims of the present study were two-fold. The primary aim of the study was to gather an in-depth understanding of the work-related conditions of PTDs in New Brunswick and how those conditions affected their health, as well as their preferences and suggestions for a better-tailored healthcare system. The secondary aim was to derive a set of key recommendations to inform healthcare services and primary care professionals, as well as the trucking industry.

Methods

Study design

A qualitative study was conducted using a descriptive qualitative approach to provide an in-depth understanding of the health and work experience of PTDs while staying true to the collected qualitative data [22, 23]. The COnsolidated criteria for REporting Qualitative research were used to structure this study and ensure its methodological quality [24].

The first author (JJ) received extensive training in qualitative research with several publications. As JJ has limited experience in the trucking industry workforce, a

consultant with more than 40 years of experience (Jean St-Onge) as a truck driver and then as an operator was recruited. The consultant contacted stakeholders from trucking industries in New Brunswick, he identified as key informants with extensive knowledge about PTDs health needs and industry contingencies. He established rapport with them to create a trustful and collaborative space that favors communication and experience sharing. The consultant organized the meetings for the data collection (set date and time) but he did not attend the interviews. All interviews were carried out solely by JJ.

Study participants

The purposive sample was composed of key informants selected among PTDs (with at least 3 months experience as a truck driver, aged 19 years and older and driving with a New Brunswick-based trucking company), and individuals working in various roles in the New Brunswick-based trucking industry, including top managers, wellness coordinators, human resources administrators and company owners. Representatives of the insurance companies were also invited who provide services to New Brunswick based trucking companies. These insurance companies and their representatives were identified by top managers who were interviewed. In total, two individuals representing two different insurance companies were recruited in this study.

Participant recruitment

Recruitment was done between June 10th, 2020, to November 30th, 2020. Emails and phone calls were used to contact trucking industries (two major companies and two individual-owned companies). The research team was authorized to display solicitation posters in five different truck lounges (two in Moncton, two in Edmundston, and one in Saint John). Social media (Facebook, LinkedIn) were also used through trucker channels to call for participation. Four advertisements were also made about the study on local radios at different time slots (morning, evening, and on weekends). The snowball technique was used to recruit participants. A total of 50 individuals from the trucking industry were invited to participate. Among them, 37 confirmed their availability for an interview, and only 26 signed the consent form and accepted to participate in an interview. A total of 26 interviews (13 with PTDs) and 13 with other participants) were included for analysis in this study. Saturation of information was reached at the 12th interview. However, interviews with the remaining 14 participants were conducted as they were scheduled, and consent forms were received. The purposive sample of key informants included female participants (PTDs and managers), immigrants, racialized people, and participants from the LGBTQ2IA community to obtain insights from diverse people. This was a convenience and purposive sample composed of individuals operating at different levels of the trucking industry to capture PTDs' needs and gather insights from key stakeholders to derive context-sensitive recommendations to inform the design and implementation of truckers' health programs. Participation was entirely voluntary, and no compensation was provided.

Data collection

An interview request was sent by email to a list of key informants. Individuals who were interested in participating in the study were asked to contact the primary investigator (JJ) to schedule a time to conduct the interview. Participants received a consent form by email presenting safeguards for protecting privacy and maintaining confidentiality. The consent form also included relevant information about the study's aims and objectives and the procedure for data collection, analysis, and dissemination. All questions were optional to answer, and participants were assured that their responses would remain anonymous. Participants had the opportunity to ask questions to the interviewer before giving written informed consent to participate (electronic signature).

Semi-structured interviews were scheduled with participants who signed the consent from and returned it to the principal investigator along with a completed short socio-demographic survey (Additional file.1), as per their convenience and in the language of their choice (French or English). The survey asked about year of birth, birthplace, sex at birth, gender identity, citizenship, place of residency, marital status, educational attainment, title of occupation and duration, type of health insurance, and annual revenue. The technique of an in-depth semi-structured interview was appropriate for exploring participants' experiences through an open and non-judgmental discussion [25]. Interviews were facilitated by the first author (JJ) using a discussion guide developed for this study (Additional file 2). The discussion guide was developed in French and English to facilitate language preferences. Open-ended questions were designed to collect information about the life realities of PTDs (for example working and living conditions, social and cultural particularities, sex and gender considerations, and industry specificities); the mental and physical health needs of those individuals (such as most common diseases, causes, and impacts on work, personal life, finances, etc.); the services available to them (for instance preventative and curative programs and services, support resources, barriers, challenges in self-management, health prevention, and literacy capacities); and suggestions for services and programs to be developed to support their health and how those should be implemented (e.g., what should be offered, the means, type of delivery). Participants were also given the opportunity to provide

any additional information at the end of the interview. Among the 26 interviews, 17 were conducted by phone and 9 used Teams or Zoom meeting software. The length of the interviews ranged from thirty to sixty minutes. Only the primary investigator and participant were present during the interviews.

A validation group composed of researchers (2 individuals), PTDs (2 individuals), and other stakeholders (2 individuals from the trucking industry) read the interview guide and suggested modifications to enhance the appropriateness (adequation of the questions to the context of the trucking industry), feasibility (expected duration of the interview) and intelligibility of the questions (clarity of the questions, wording, and concordance between the two language versions English/French). The final version of the interview guide was submitted for approval by the validation group. A summary of key findings (through presentations, infographics, and pamphlets) was shared with key stakeholders and study participants.

Data analysis

Audiotaped data was analyzed using content and thematic analysis. The data analysis (by JJ and EC) was done manually using an Excel sheet developed by JJ and based on the discussion guide. The analysis first involved transcribing the participants' discourse through audio-taped interviews, using their exact keywords and phrases. Two analysts listened several times to the interviews and organized a first meeting to discuss the objectives of the study and their first impressions about the content of the interviews as well as to build a common understanding on how to analyze the data. The analysts identified recurring patterns and terms and designated them as keywords. These keywords and phrases were then coded into main ideas to represent their discourse best, involving their ideas, perceptions, attitudes, and feelings. To ensure consistency in data analysis, 5 recorded interviews were randomly selected, and two analysts independently coded them. Then, they compared their analysis and discussed discrepancies where relevant to the study objectives. This strategy allowed the assessment of the inter-coder consistency for data analysis to ensure that the same interpretative approach was used by the two analysts to analyze the data in a complementary manner. Only one round was necessary, as the inter-coder consistency was considered acceptable, and no major discrepancy was found [26]. The remaining 21 interviews were divided between the two analysts (EC: 9 and JJ: 12) and data analysis was carried out in parallel. Codes were created through open and axial coding to capture emergent themes using a coding logbook [27]. The rationale behind codes was discussed to establish consensus when inconsistency was observed between coders. A third team member (SEA) was designated as the referee to address disagreements between the two members. However, the referee did not have to intervene. The coding logbook was actualized during the data analysis meetings to reflect coders' discussions. Codes were then broadly categorized into main themes and sub-themes for explanatory and interpretation purposes. The iterative process of analysis and discussion continued until there was sufficient data to saturate the themes [27]. Due to the exploratory nature of the study, no theories or models were used in the categorization process of the data or used to develop specific hypotheses.

All interviews were audio recorded and recordings were stored in an encrypted laptop to secure the data and protect personal information. The data analysis was done on a secured computer at Moncton University, which was only accessed by the analysts.

Results

A total of 26 semi-structured interviews were carried out, and all of them were included in this analysis. Thematic content analysis of the gathered qualitative data highlighted work-related experience, healthcare services experience, and health needs, as well as suggestions for personalized services and interventions. Emerging themes were categorized and presented with illustrative quotes. To preserve anonymity and confidentiality, quotes were tagged using a pseudonym (participant code number). French quotes were translated (free translation) into English for this publication.

The social and demographic characteristics of the participants interviewed are summarized in Table 1. Participants' mean age was 45.5 years (SD=8.4). Of the 26 participants, 13 had various roles within the industry, including the president of the trucking company, orientation and onboarding specialist, human resources and management staff, director of driver services, assistant vice-president of fleet services, safety officer, wellness coordinator, and director of highway operations. The remaining 13 (50%) participants were long-haul truck drivers. The mean number of years worked by the participants in the industry was 9.8 years (SD=11.7, range: 4 months −41 years).

"My life as a trucker!" understanding needs and challenges

The first emerging theme encompassed the vast needs and challenges of PTDs, related to their work realities, health status, and healthcare accessibility. More than 77% (20/26) of the participants mentioned independence and freedom as key aspects of the "*culture of the truckers*". For example, one participant mentioned that "*you are a trucker, or you are not… Being on the road… you know… it's a freedom that worth gold… you know… not just a simple job… a culture thing, maybe…*" (PTD participant #19, free translation from French to English) and another

Table 1 Social and demographic characteristics of participants (*N* = 26)

Characteristics	n (Percentage)
Type of participant	
Industry and Insurance	13 (50)
Professional truck drivers	13 (50)
Sex/gender	
Male	20 (77)
Female	6 (23)
Place of birth	
New Brunswick	16 (61.5)
Elsewhere (Canada, Europe)	10 (39.5)
Country of citizenship	
Canada by birth	18 (69)
Canada by naturalization	8 (31)
Marital status	
Single (never married)	2 (8)
Married	13 (50)
Common-law	5 (19)
Divorced	6 (23)
Educational attainment	
Secondary/high school (grade 12)	14 (54.8)
University	7 (27.0)
College	5 (19.2)
Type of health insurance	
Private	22 (84.6)
Only access to public services	4 (15.4)
Annual income	
$20 000 - $39 000	5 (19.20)
$40 000 - $59 999	9 (34.6)
$60 000 - $79 999	4 (15.4.2.1)
$80 000+	8 (30.8)

participant reported that "*I come from a family of truckers… and my kids will drive a truck… it's hard but it's our way of living…*" (PTD participant #24). While being a PTD is mostly a lifestyle choice, all participants agree that PTDs are exposed to many workplace stressors that put them at greater health risk when compared to the general population. Work-related stressors include long working hours, being away from home for long periods, minimal living space, meeting strict expectations, and needing the ability to adapt to unexpected circumstances like accidents, weather conditions, construction, etc. One participant described the reality of truck driving as a change in way of living, "*It is a lifestyle change. If someone is new to being a truck driver it is a whole re-working of your brain. You're not going home at night. These guys here on the road, they're on the road for several weeks or months at a time where they are not going home every weekend.*" (industry participant #1). Several participants also raised personal safety concerns when traveling to new and unfamiliar areas, at nighttime, or during extreme weather events (i.e., ice storms and gusts of wind). Safety concerns were reported to be worse for females "*Not all male truck drivers are easy to deal with… Some guys are not as understanding as others, they don't think we female drivers should be there… You know, if someone wants to make you a target, it is an easy thing to do in a dark parking lot.*" (PTD participant #3), but male PTDs also reported safety concerns on the road "*roads that can be dangerous … weather… animals… sometimes people… you get to know how to be safe… we all have stories about situations… you know… scary situations…people crashing their car against your truck… arm attacks… and you know… not all of us can handle that…*"(PTD participant #17),

In terms of demographics, most participants declared that the industry was composed predominantly of male drivers. Participants reported a favorable and supportive community of drivers regardless of gender identity distribution, such that they often helped each other doing tasks that required physical efforts, and training new drivers. "*Next time you are on your own. Men will stop to help. That's the way we are… we care…*" (PTD participant #1). However, participants discussed that cis-gendered women experienced the repercussions of working in a male-dominated field, such that they did not always obtain help when needed, and it was implied that women should have the same abilities as men (i.e., physical strength). "*They don't mind helping you, but you have to be able to do the job.*" (PTD participant #1). Many other social concerns were raised during the interviews, including experiences of sexism, discrimination, and racism. A female truck driver described an experience of discrimination at a worksite when someone asked "*What is she doing in here? I'm a trucker [she answered]. It was offensive to me because I was questioned. The guy behind me wasn't questioned*" (PTD participant #1). Some participants mentioned that racialized PTDs and linguistic minorities were at high risk of experiencing discrimination and passive-aggressive behaviors from other PTDs or employees at truck stops. Some participants also reported having experienced unjust treatment and hostility from dispatchers (individuals responsible for arranging delivery and pick up of freight) which further exacerbated the already stressful working conditions, "*Drivers are not treated fairly. Often at dispatch level, someone gives orders [to the PTD], must be here, must be there, most dispatchers were previously truckers who seem to know everything. Almost slave-like treatment.*" (PTD participant #4, translated from French to English). "*When you don't speak English very well… and you're colored [racialized person] you have do the job that others do not want… I have my family, I need money… so, no much room for me to say no… I get the work they give me*" (PTD participant #26).

Financial challenges are prevalent among PTDs. Indeed, participants acknowledged that most PTDs experienced financial difficulties due to poor financial

management skills; for example, "Minority are well off financially, *but most live paycheck to paycheck*" (industry participant #4, translated from French to English). Working in the trucking industry requires a lot of sacrifices (personal, familial, social, etc.). Participants mentioned that their relationship with money was complex and could be conditioned by the guilt of always being far away from family in important times (i.e., the birth of a child, graduation, wedding, death of a parent, serious illness). Some PTDs declared that spending money to please family and loved ones was a way to ask for forgiveness for being away most of the time.

Several participants also highlighted that the struggles that PTDs face were amplified during the COVID-19 pandemic and that it was the "*toughest time ever*" (industry participant #3), not only for PTDs themselves but also for employers who worked hard to support drivers during this time. When public health restrictions were in place, access to restaurants, bathrooms, and groceries was limited, and sometimes denied to PTDs as they were considered "*transmitters of the COVID-19 virus*". Although there was no evidence or data to support this, mischaracterizations were made of PTDs, including those who must travel across the border and between provinces, there were misconceptions among the general population. These misconceptions added to the stigma experienced by many PTDs.

All participants reported that several physical health challenges were particularly prevalent among PTDs, including obesity, diabetes, high cholesterol, high blood pressure, sleep problems (such as atypical sleep patterns, poor sleep quality, and sleep apnea), musculoskeletal injuries (for example, back pain), and heart disease. Regarding mental health, participants consistently reported depression, anxiety, experiences of trauma, loneliness, and social isolation. They felt lonely while on the road, but also when they were back home as they did not have time to socialize "*I find its very hard to when I come home I have so much to do, hard to get out to socialize, all I want to be is home.*" (PTD participant #1) and "*I'm from [country] and I'm here by myself to work, my family is there… and I have to work to get money to bring them here… but it is hard being so far for months…*" (PTD participant #22). The trucking community was also described by the majority as a group of men who refrained from talking about their emotions or mental health challenges thus not seeking professional support. "*I have the impression that people say, "I don't need that, I'll get over it, it's not important enough", when you don't feel well you call the doctor. It's the employee himself who puts up the barriers for one reason or another. [For example, going to see help is] not necessary, others who are worse than me, I can tough it out by myself.*" (industry and insurance participant #4). Because of work demands, some participants also explained difficulties in maintaining social relationships and reported difficulties in balancing their work and family life commitments.

In terms of health behaviors, an unbalanced diet, unhealthy eating, physical inactivity, and sedentary habits were common and mostly explained by a lack of supportive resources (i.e., information, education, and coaching). Moreover, where some of these resources existed, they were too expensive or were not covered by insurance. Participants explained that a large percentage of PTDs had the habit of smoking and used to drink too much coffee, as they believed it could help them cope with fatigue and stress. It was mentioned by PTDs that they avoided drinking much water as they wanted to avoid the need to urgently stop to urinate, while they were on the road during nighttime or when they were in areas where safety could be an issue.

Important challenges were reported regarding seeking health care services. Participants mentioned challenges in scheduling appointments (inaccessible hours of service), limited parking, and affordability. Most participants mentioned that though PTDs had services like publicly funded health services, private services covered by their insurance, employee assistance programs for mental health, etc. available to them, utilization was not always optimal. "*It is hard to schedule anything that doesn't impact your work. I am very fortunate with these guys; they work around my appointments. But if I say to someone, I need an appointment in the morning and they say 10 am, well for us, first thing in the morning is 3 am. 10 o'clock for us is in the middle of the day. Potential to lose a full day of work, at least half a day, and if we are paid by the mile, that's a challenge for sure.*" (PTD participant #3). Moreover, PTDs might be reluctant to use mental health services offered by the company (i.e., Employee and Family Assistance Program) as they were afraid of a possible breach of confidentiality or professional labeling, which could have negative impacts on their employability. Access and utilization of health services were also negatively impacted by financial challenges as *"some truckers will not access health services because they can't afford to pay the % amount that the insurance does not pay."* (industry and insurance participant #5). While companies are engaged in supporting PTDs to improve their health, these programs could be jeopardized by other work-related emergencies and priorities "*Company takes very seriously about health and wellness - but they get in the real world and get lost in the shuffle sometimes.*" (industry and insurance participant #9) or did not attract those who needed them the most "*We have tried to promote some things, have not been overly successful, with exercise and health devices (exercise rooms), never got a lot of buy-in. Only a handful of guys were interested, and*

these were the ones that were already active (stop for a bike, jog, etc.)." (industry and insurance participant #9).

"Taking care of myself, do you think it is easy while you're on the road?" Describing drivers' preferences and motivators for a better health

The second theme represented truckers' preferences for health support (i.e., how they see health services and how health programs can be tailored) and what motivators would enable them to act toward their health. Participants highlighted different preferences for how they would like health services to be delivered to them. Above all, there was a preference for online services and innovative technologies because they are most accessible for truck drivers "*electronic solutions can help and facilitate access to services without missing working hours.*" (PTD participant #3). Respondents also mentioned that they had in-person services at truck stops or accessible locations for truckers. When queried on peer-led services, the large majority endorsed this idea and recommended that it could be a powerful experience to reduce stigma and discrimination, especially for male truckers, "*I think if it's coming from someone from their own background or someone going through the same experience it might be an easier approach for sure.*" (industry participant #4, translated from French to English).

The majority of participants identified a preference for information to be communicated in a concise, short, and in a way that is relevant to truckers and accommodating of the low literacy challenges of PTDs. One participant shared the benefits of having written information reviewed by one of the truckers before distribution to ensure that it would be well received, "*One of the challenges we face is how to communicate with the drivers. [...] They seem to have a language of their own. If we try to replicate the same communication from the staff to the drivers, something gets lost in the translation. So now I will sometimes I may reach out to drivers and say hey, if I sent this out, does this make sense to you? And bounce it off of them and maybe get some input, seems to be very effective.*" (industry participant #9). Above all, participants explained that individual variability should be considered when encouraging individuals to use health services, and these differences might vary significantly by gender. Participants mentioned the importance of developing gender-sensitive health programs, including prevention and health education. The PTD community is becoming diverse, and gender-sensitive health programs are needed. Moreover, the annual health booths and occasional health education programs delivered in larger trucking industries are not sufficient and do not address most of the PTDs' needs. The participants recommended that women's health, men's health, and LGBTQ-sensitive health programs are essential and should be tailored to PTDs' needs and challenging working contexts where stigma and discrimination may affect access and utilization of services. Participants explained that although each person has different comfort levels when it comes to their health, a personal and meaningful encounter with truck drivers could go a long way: "*Someone first told me when I first entered this world, it is very easy to make a driver happy. Because their expectation of the industry is so low, that giving them the time of day or helping them, you've made their day.*" (industry participant #1).

Several participants also discussed how the social dynamic of truckers was an advantage and could motivate truckers to act positively toward their health. For example, having a competition between program participants to increase motivation and engagement, "*Most people have a competitive edge and like to the recognition, it could have some success*" (industry participant #9) and "you know the time can feel long in truck… so, having some activities that we can engage in… compete… and have rewards… any kind of rewards would be OK… I think that would work [laugh]… we are little boys… [laugh]…" PTD participant #22). Many other extrinsic motivators were suggested, such as incentives or rewards (e.g., financial rewards) to increase the motivation and participation of PTDs in program activities. Fewer intrinsic motivators were proposed, but having a personal advantage or recognition of successes would go a long way since truckers often felt ostracized by society. For instance, many discussed that truckers internalized the recognition of their essential work during the pandemic and that having a similar type of recognition, on a personal level, could help increase the intrinsic motivation of truckers to act positively toward their health. "*Covid gained a lot of respect for truckers. They're often considered a bunch of fat and overweight guys but they became a big piece of supply change, like delivering toilet paper. They gained a lot of respect during the pandemic [which is] much needed among the industry. Can use to enhance their motivation*" (industry and insurance participant #8).

"Can you hear what we need?" translating needs into recommendations for tailored health services

The third theme reflected ideas on how the trucking industry and insurance could support or be engaged in fostering truckers' health and what innovations could be developed. Most of the PTDs were in favor of developing services that were accessible to them, such as mobile sites, flexible hours of service, applications (health applications that can be downloaded on smartphones and tablets, such as step counting), etc. They also mentioned that those services should focus on health education like healthy eating, exercise, psychoeducation, etc. Some respondents also suggested developing services that fit with the current social dynamic of truck drivers. For

example, one participant suggested that a health education session could involve a more social, relaxing, and informal format, including a presentation on a health topic and a reward for participating: *"[For example, by giving] opportunities to the truckers. We have a bus, going to go downtown to Moncton for a walk, get a coffee, talk about health and wellness, financials. Someone might sign up for that, get free things, meet others."* (industry participant #10). A few respondents also noted the importance of considering the stigma that some male truckers would face in engaging in health services, especially if seeking mental health services at a mobile clinic at a truck stop since this population was already reluctant to speak of mental health challenges.

In terms of opportunities for the trucking industry and insurance to be involved, most participants expressed the need for systematic barriers to be addressed for truck drivers to be able to access the services that they require in a timely and appropriate manner (i.e., opening hours from 9 to 4, administrative slowness, length of waiting lists, lack of access to primary care providers, lack services integration and coordination, lack of effective communication between health professionals and health systems). Participants suggested opportunities for truck drivers to be more financially secure, as some reported that it had an impact on their willingness to access health services because often, they must miss work and experience the financial repercussions. Other responders also expressed their desire for having access to private health care insurance or accessible services covered by their health insurance, for example, *"[a service] connected to our benefits so they don't have to pay, swipe card and move on"* (industry participant #10). Ultimately, a conceptualization of the responses from the persons interviewed was that employers did the best they could to provide financial support to truckers, but larger-scale collaborations were needed with other organizations/systems to address financial barriers faced by truckers.

Recommendations for a tailored primary care service and its organizational structure were developed based on truckers' needs and suggestions. A virtual primary health care service with extended hours of service, including evenings and weekend timeslots, was recommended to alleviate the barriers that truck drivers currently face when accessing health care services. Virtual health care would also eliminate the stigma that truck drivers face when accessing health care services. This service should also emphasize patient-centered care, such as an awareness of who the patient is and what their strengths and challenges are. Study participants were predominantly older men, having low levels of literacy as well as self-reliance and reluctance to use health services. Therefore, truckers should be involved in the decision making to address their health issues, which would empower them and act positively toward their health. Motivational interviewing strategies would also be beneficial to increase the intrinsic motivation of truckers to shift focus and gain a larger perspective of their health. Raising awareness of the reality and health needs of truckers among health professionals would be needed to implement this strategy, which could entail offering specific training and workshops for them to work with this population. Training could be focused on effective communication, supporting health behavioral changes, coping with chronic illnesses, motivational interviewing, etc. Mental and social health programs tailored to the needs of truckers should also be developed to address the challenges they face like loneliness, divorce, finances, maladaptive coping strategies, etc.

As for the organizational structure of the virtual clinic, strong inter-professional collaborations would be needed by the truckers to obtain adequate health care. This would involve ongoing communication between professionals and direct truckers to avoid duplication of services and to provide a service that they would benefit from. The type of health professionals, technology, resources, and funding to be involved in the development of virtual clinics would need to be determined.

Discussion

This study delineates the health needs of the PTDs of a rural province in Canada including the challenges they face in accessing and using the existing healthcare services and their preferences for healthcare to develop an intervention program. PTD is a unique occupation, as it has continuous impacts on the physical, mental, and social health of the PTDs. The analysis of the data in this study revealed three intersecting themes, which reflected the needs and challenges of the PTDs related to their health and healthcare accessibility, truckers' preferences and motivations for healthcare support, and their perceptions on how supporting processes could be developed in fostering their health and wellbeing through an innovative process.

Understanding needs and challenges

This first theme symbolized the health needs of the PTDs and the challenges they faced to fulfill their healthcare needs. Evidence shows that truck drivers are an important clinical population to consider because of the multitude of health risks and adverse experiences that they face [5]. This population suffers from numerous chronic illnesses [5, 10, 18, 28] and psychosocial health challenges [3, 14, 16], yet encounters significant barriers to accessing healthcare services and resources to improve their health [14].

The findings of this study confirmed the current literature that truck drivers experienced numerous

occupational stressors and challenges related to their health and accessing healthcare services, and those challenges experienced during the pandemic were amplified [2]. The reality of truck drivers in certain parts of Atlantic Canada, namely New Brunswick, resembles those reported in the literature, where, as part of their occupation, they are sitting for long periods and have minimal access to healthy food [2, 4, 6, 10]. These risk factors increase the likelihood of developing chronic illnesses and negative health and life outcomes [5, 6]. However, participants in this study did not express high-risk behaviors of truckers (i.e., substance use and sex) that had previously been found in the literature [3, 16]. Participants also emphasized that the majority of the truck driving community, which was largely comprised of middle-aged men, often did not talk about their emotions or mental health challenges. Since participants from this study sample likely came from rural areas in Atlantic Canada, the challenges that they faced regarding mental health were likely heightened due to the stigmatization surrounding mental health [29]. Participants also reported financial difficulties consistent with the literature [14], thus affecting the amount of money that could be attributed to seeking health services and opportunities to improve their health. In terms of health care access, participants in this study expressed significant difficulty accessing health care in a public health system that was based on an 8−5 workday that was simply inaccessible to them. This is in line with the barriers found in the present literature [14].

Preferences and motivators

The second theme represented truckers' preferences for health support. Rather than trying to fit truck drivers into the health system, this study participants favored developing a health service shaped by their needs. Accessible health services were largely advocated for through a virtual platform or in-person clinics along truckers' routes. Truckers also emphasized that these services should not only be physically accessible but highlighted the need for services to be tailored on a cognitive level as well including using language that can be comprehended, allowing them to take an active role in their health. Studies have shown that when patients are actively involved in managing their health conditions, they report feeling empowered and have a sense of urgency toward their health [30]. This kind of care could have a powerful impact since this population already feels excluded and ostracized from society [2, 3]. Overall, intentional time spent with patient truckers, building rapport and trust, could lead to positive health impacts [30], starting with health education to inform healthy behavior choices and motivational strategies to increase intrinsic motivation to change.

Recommendations for tailored health services

The third theme provided ideas on how different stakeholders in the trucking industry (truck companies, insurance services, etc.) could become involved by taking an active role in fostering truckers' health and developing innovative and tailored solutions. The literature shows that innovative approaches like the use of mobile apps [31], and telehealth [32], could be successfully used to provide health services to this group. The establishment of mental health clinics could be a significant step in addressing the mental health issues of PTDs, and to alleviate the stigma related to mental health, it could be packaged as a health clinic.

Employers have a significant role in planning and implementing intervention programs and services for PTDs. Their understanding of PTDs' healthcare needs and their ability to integrate any initiative into the regular operations of the trucking industry can provide invaluable insight. It is crucial to involve all levels of the trucking industry in the design and implementation of changes. Clearly assigning responsibility for these changes and involving the relevant parties ensures a collaborative approach and the relevance of the solutions.

It is important not to minimize the governmental and industry influences on the health and accessibility of truckers' health care. Participants' reports of significant systematic barriers to receiving health care, which is echoed in another study conducted in Canada by Johnson et al. [21]. This study interviewed PTDs residing in Ontario, Canada. PTDs mentioned that government policies sometimes were very rigid and influenced the flexibility of their working hours, which had detrimental effects on their health [21]. Similar to Johnson et al. [21], participants in this study expressed governmental bodies have a strong influence on the ability of truckers to receive the care that they need, including missing time for work and experiencing financial impacts. In Johnson et al., PTDs mentioned that they might lose their license if they disclose their health concerns to health service providers. In contrast to Johnson et al., who found that this was due to fear of job security, participants in this study expressed fear of financial security (missing time at work, losing miles, being paid less). Both cases would affect a patient's willingness to seek health services and follow treatment goals, thus highlighting the need for services to be tailored to the needs of truckers and their work realities.

The present study has important strengths and limitations to consider. This study is the first qualitative study in Atlantic Canada that explored work-related conditions of PTDs affecting their health as well as their recommendations for a better-tailored healthcare system. Virtual recruitment strategies and the promise of protected identities made truckers feel safe to participate in this study.

For instance, Shattell et al. [16] protected the identities of the truckers to protect them from potential negative repercussions at work with their employers. Other studies have found that truckers are hesitant to open up to health professionals because they fear it will get back to their employer and affect their capacity to work. As a result, interactions among them are mainly rigid, superficial, and for specific purposes like health examination [13]. Healthcare services have a significant impact on how PTDs access and use those services. It is important to have a deeper understanding of the expectations of PTDs and take into account their recommendation for developing targeted and innovative ways to provide healthcare services to this population. Another strength of this study is that study participants included not only PTDs but also other professionals in the trucking industry including insurers, managers, and owners, who have a significant impact in assessing their health needs and providing support to develop innovative approaches to address those needs. Having these representations on the participants' list provided a broader overview of the current situation on PTDs' health and their healthcare needs. In this study, some employers encouraged their drivers to participate in the study, which could have impacted the information shared.

A limitation of this study is that PTDs of different ethnic and racial origins, as well as of different gender identities could be well represented. Also, interviewing members of the trucking industry might not capture the exact reality of truckers' experience as they might not have a good idea of their internal struggles. However, including members of the industry was advantageous to bypass participation challenges (50% non-response rate seen in other studies [18]), and among individuals who were recruited, the majority had extensive experience in this domain. Through this study, insights from diverse perspectives were generated by incorporating the views of truckers and other stakeholders in the industry, which helped to get a broader perspective of the healthcare issues of PTDs. Future studies could include samples primarily comprised of truckers to understand firsthand their needs and preferences and how these might vary by gender.

Conclusion

This study demonstrated a deeper understanding of the health needs and challenges of PTDs in accessing healthcare services in Atlantic Canada. It intends to inform and develop targeted interventions and support tailored to this occupational group. Comprehensive and accessible healthcare solutions for this unique professional group are required through collaboration among healthcare providers, policymakers, and other relevant stakeholders.

Findings from this study indicated that addressing the health concerns of these truck drivers requires a holistic approach integrating preventive measures, health promotion, education, and easy access to healthcare services. Initiatives such as telehealth services, and targeted wellness programs could help ensure that the PTDs receive the necessary care to maintain their health and well-being. By implementing evidence-based and target-population-informed strategies and fostering a culture of health promotion within the trucking industry, a healthier and more resilient professional truck-driving workforce can be developed.

Furthermore, the insights gained from this study could support policy reforms and create targeted interventions that prioritize the health of professional truck drivers, fostering a positive impact not only on individual well-being but also on the broader health landscape in Canada.

Abbreviations

PTD	Professional truck driver
COVID	19–Coronavirus disease 2019
SD	Standard deviation

Supplementary Information

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Supplementary Material 1

Supplementary Material 2

Supplementary Material 3

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Author contributions

All authors have made significant contribution to this manuscript. Principal investigators (JJ and SEA) have contributed equally to the design of the project, the planning, and the conduct of the data collection. They participated in the teamwork (including EC and SC) for the analysis of the data (development of the codebook, codes' organization), discussions if consensus was not achieved and worked collaboratively on second coding and conceptual categorization) and the discussion of the results. JJ and EC prepared the first manuscript draft; all authors (JJ, SEA, EC and SC) contributed to, reviewed, and approved the final manuscript. JJ, SEA, SC and EC have approved the submitted version and have agreed both to be personally accountable for their own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

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Data availability
Data may be obtained from a third party (Jalila Jbilou) and are not publicly available.

Declarations

Ethics approval and consent to participate
The study received ethical approval from the research ethics boards (REB) of the Université de Moncton (Canada) #1920-034. All participants signed a confidentiality and consent form. They were aware that they could withdraw from the study at any time.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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