www.iqresearchjournal.com
ISSN: 2790-4296(Online)

IQRJ: Volume 003, Issue 006, June 2024
Original Research Article

Psychosocial analysis of vaccine reluctance factors against COVID-19 among health workers in Ngaoundere Urbain health district

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To cite this article:
Authors: ETOUA ONDOUA Galvany Maxime, ANTSELE ONANENA Blondel, ADDA GOUDOUGOU Marie Aimée, WAWOUA Martine. Paper Title: Psychosocial analysis of vaccine reluctance factors against COVID-19 among health workers in Ngaoundere Urbain health district
IQ Research Journal of IQ res. j. (2024)3(6): pp 01-22. Vol. 003, Issue 006, 06-2024, pp. 001-022

Received: 19 06, 2024; **Accepted**: 10 07, 2024; **Published**: 12 07, 2024

Keyword

psychosocial analysis, reluctance, vaccine, COVID-19, healthcare workers
Received:
19 06, 2024

Accepted:
07 07, 2024

Published:
12 07, 2024

Abstract

The aim of this research is to study the determinants of reluctance to vaccinate against COVID-19 among staff in the Ngaoundere Urbain health district. The COVID-19 disease emerged in China since December 2019 and rapidly spread around the world, taking on a pandemic status. Cameroon has been facing this pandemic since March 2020. In December 2020, the WHO adopted vaccination as a priority strategy to limit mortality due to this disease. Cameroon has been implementing this strategy since April 2021, but vaccination coverage remains low. Taking into account the level of knowledge of healthcare staff on the importance of vaccination and being direct actors in this policy, these staff do not systematically adhere to vaccination against COVID-19. Vaccination data for staff in the Ngaoundere Urbain health district as at June 01, 2022, show 476 staff vaccinated, for a target of 1029, i.e. 46.3% vaccination coverage. Correlational analysis showed a strong link between reluctance to vaccinate and contextual factors ($r = .8008$; $p < 0.01$), lifestyle ($r = .4211$; $p < 0.05$), psychosocial factors ($r = .6993$; $p < 0.01$) and peer influence ($r = .4665$; $p < 0.05$). The results of this research will provide some answers to the observed paradox of low adherence to COVID-19 vaccination among healthcare workers, with the aim of strengthening communication strategies to improve vaccination coverage.

Keywords: psychosocial analysis, reluctance, vaccine, COVID-19, healthcare workers

Introduction

Training is the set of formal means that an organization puts in place and uses to facilitate the learning of the knowledge, skills and behaviors required to carry out its tasks and achieve its objectives (Feldman, 1989). In this sense, official programs or curricula are the preferred means of training and integrating both health-care personnel and other skill groups. But the concept tends to cover other, broader meanings, defining itself as personal development for a specific, perceived effectiveness. In addition to face-to-face or distance learning courses, we now include in-house programs such as multimedia self-learning aids, monitoring, coaching and many other means aimed at providing formative value in future work situations. These are complemented by practical training courses for on-the-job development, including an introduction to professional ethics and deontology, and the reinforcement of work involvement and professional commitment. This implies that, in the first instance, health care staff must be the ones to apply all health measures aimed at maintaining or preventing perfect health. However, in this study, the implementation of vaccination policy against COVID-19 leaves something to be desired. The problem raised by this research is the one we will address in the various articulations of this work.

1 The problem

In press release N° 45 (06 March 2020), the Minister of Public Health, confirmed the detection of the first case of COVID-19 in Cameroon. On March 17, 2020, on the very high instructions of the President of the Republic, the Prime Minister, Head of Government, prescribed disease prevention and control measures throughout the national territory. According to the Situation Report COVID-19 n°5 from the Coordination of Public Health Emergencies Operations Center (PHEOC) / Ministry of Public Health of Cameroon, published in June 2020, a few months after the first case was detected, all 10 regions were affected. The Adamawa region recorded its first case on April 17, 2020. As the pandemic evolved, the Ministry of Public Health reoriented its actions to decentralize the response, with the health district at the heart of the system. Situation Report COVID-19 n°16 of the Adamawa Regional Incident Management System COVID-19, published in June 2021, reports that as of May 31, 2021, all health districts in the region were affected, with a total of 2,800 cases and 53 deaths, including 72 infected health personnel, one of whom died. With the emergence of new virus variants, coupled with lax compliance with preventive measures among the general population, the contagiousness, severity, and infection rate of healthcare personnel have risen sharply. Given the scale of the pandemic, vaccines have become an essential new weapon against COVID-19.

According to the World Health Organization (WHO) (2020), vaccination is a simple, safe, and effective way of protecting against dangerous diseases, before coming into contact with them. It uses the body's natural defenses to build resistance to specific infections and strengthen the immune system. If the body is subsequently exposed to the same pathogens, it is immediately ready to destroy them, thus preventing disease. (WHO, 2021a).

Taking into consideration the alarming situation and the urgency of the situation, several Western and American industries have embarked on the search for vaccines to immunize populations. Working as fast as possible, scientists around the world are collaborating and innovating to provide screening tests, treatments and vaccines that, together, will save lives and put an end to the pandemic (WHO, 2021b). It was against this backdrop that on December 21, 2020, the first COVID-19 vaccine, the result of cooperation between an American and German industry (Pfizer BioNTech), was authorized by the European Commission through the European Medicines Agency (EMA), based on the favorable opinion of the Committee for Medicinal Products for Human Use (CMPHU). Although the vaccines have not been licensed by the WHO, they have been administered to high-risk populations in several countries, but in these Opinions, the Comité International du Québec (February 2021) mentioned the importance of closely monitoring the efficacy of COVID-19 vaccines under usual conditions of use, to enable any necessary adjustments to the vaccination strategy to be made quickly and if necessary.

As a prelude to the arrival of the vaccines in Cameroon and due to the very high demand for vaccines, the Scientific Council for Public Health Emergencies (SCPHE) of the Ministry of Public Health, in its Opinion n°8 published in May 2021, ruled and prioritized the targets of this first vaccination phase. Healthcare personnel, being classified as very high-risk taking into account their constant proximity to confirmed cases of COVID-19, were the priority target for vaccine administration, followed by people with co-morbidities and the elderly.

According to the COVID-19 Situation Report n°79 from the Coordination of PHEOC / Ministry of Public Health (April 2021), on April 11, 2021, Cameroon received its very first supply of vaccine, i.e. 200,000 doses of SINOPHARM vaccine, and on April 12, 2019 the COVID-19 vaccination campaign was officially launched by the Minister of Public Health, in order to set an example for the acceptance of vaccination.

On April 13, 2021, the Adamawa region received a very first supply of 8,400 doses of SINOPHARM vaccines dedicated to the region's health personnel. The official launch of the vaccination campaign for health personnel was carried out on the same day by the Regional Delegate for Public Health. Health workers, who are classified as very high-risk in view of their constant proximity to potential cases of COVID-19, taking into account the performance of their oath beyond the level of knowledge on the importance of vaccination, and being the direct actors in the implementation of vaccination campaigns, do not spontaneously and systematically adhere to vaccination against COVID-19. According to the Evaluation Report on the COVID-19 response in the Adamawa region (June 01, 2022), data on vaccination of health personnel in the district of Ngaoundere Urbain, show 476 health personnel vaccinated, for a target of 1029, i.e. a vaccination coverage of 46.3%. This undoubtedly raises the issue of their reluctance to be vaccinated against this pandemic. According to Yaya Sangare et *al* (June 2020), vaccination is not yet systematic in most African countries. This is the case in Cameroon in general, and even among health personnel. At the Seventy-fifth World Health Assembly (May 28, 2022), the WHO appropriated these facts, clearly stating that the attitude of healthcare workers was inadequate because it did not conform to the oath they had taken, and as such, they were reluctant to vaccinate against COVID-19.

In view of the above, it is legitimate to ask what are the determinants of reluctance to vaccinate against COVID-19 among health workers in Ngaoundere Urbain health district?

1.1 Health

According to LE ROBERT dictionary (June 2021), health is a good physiological state of a living being, regular and harmonious functioning of the organism. This definition highlights the notion of physiological state, which is the healthy state, rather than the normal state. Man is healthy insofar as he is normative in relation to the fluctuations of his environment (Georges Canguilhem, 1966). This definition does not take into account the mental and social aspects of human well-being. It can therefore be supplemented by the WHO's (1946) definition, based on its Charter, for which health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity. This definition, which goes beyond the physiological state, highlights not only the notion of mental health, but also that of health sociology, which Guido Giarelli (2013) describes as a sub-discipline articulated around four main components.

1.2 COVID-19

COVID-19 is a disease caused by a new coronavirus, SARS-CoV-2. WHO (2020) learned of this new virus on December 31, 2019, when an outbreak of "viral pneumonia" cases was reported in Wuhan, People's Republic of China. Recent data in the literature suggest a risk of airborne transmission of SARS-CoV2 that has probably been underestimated, notably via aerosols generated by coughing or sneezing, but also more simply speech and breathing (Gehanno et al., 2020), which may explain viral transmission from asymptomatic carriers. Bio-aerosols produced during mouth breathing, an expiratory process in people who usually breathe through the mouth, must be considered, in addition to nasal bioparticles, as a potential mode of transmission of COVID-19 (Saravanakarthikeyan Balasubramanian and Divya Vinayachandran, 2021).

According to the WHO (2020), the most common symptoms are fever, dry cough and fatigue. Other less common symptoms may affect some patients, such as loss of taste and smell, nasal congestion, conjunctivitis, sore throat, headache, muscle or joint pain, rash, nausea or vomiting, diarrhea, chills or dizziness.

People aged 60 and over, as well as those with other health problems, run a higher risk of developing a severe form of the disease (WHO, 2020). The most effective supportive care for COVID-19 is oxygen therapy for patients in severe condition and those at risk of developing a severe form of the disease, and more advanced respiratory assistance such as ventilation for critically ill patients. Dexamethasone is a corticosteroid that can help reduce the duration of ventilator placement and save patients in severe or critical condition (WHO, 2020).

SARS-CoV-2 is a Ribonucleic Acid virus that mutates to produce a variety of strains. Mutagenic agents include ultraviolet rays, metals and endogenous components of organisms. Each strain is specific in terms of virulence, immune response in the body and vaccine efficacy (Roy et *al.*, 2021). According to the WHO (2020), the best way to combat the disease is to respect physical distance, wear a mask, ensure good ventilation of rooms, avoid crowds and close contact, wash your hands regularly and cough into your elbow or a handkerchief. But with advances in research, vaccines are now being used to develop herd immunity.

Based on the above, we formulated the following research question: what factors determine reluctance to vaccinate against COVID-19 among healthcare personnel? The anticipated answer to this question, which is also our general hypothesis, is as follows: contextual and psychosocial factors determine resistance to COVID-19 vaccination among healthcare personnel. From this hypothesis flow the two research hypotheses presented below:

Hr_1: contextual factors determine reluctance to COVID-19 vaccination among healthcare workers.

Hr_2: psychosocial factors determine reluctance to COVID-19 vaccination among healthcare workers

1.3. Contextual factors

According to Frédérike Limousi (2013), vaccination behavior is determined by a large number of factors, including the vaccine's specific characteristics, the context, and individual and social factors. A study showed that childhood habits, independent living and peers are motivations for young people to improve their food choices. (G.L. Alexander et *al*, 2017). It also shows that student life has a negative influence on the regularity of their meals, leading them to prefer not to eat rather than having to cook or to choose fast food. By induction, insufficient health education influences whether or not vaccination is adopted (Cristina Bianca Pocol, 2017). In a study conducted in France, attitudes towards COVID-19 vaccines were found to be significantly correlated with political partisanship and engagement with the political system (Jeremy K.Wardab et al, April 2020). According to B.Becker (2021) voluntarist vaccine policy is risky, compared to a harsher policy, in order to compel people to vaccinate, for a common welfare, rather than a satisfaction of a personal need. According to Jocelyn Raude, (February 2016), two sociological phenomena help to explain the growing number of controversies surrounding vaccination. The first stems from a growing crisis of confidence in public authorities in general, and in health authorities in particular. The second stems from the radical transformation of the information "market" linked to the emergence of electronic media.

1.4. Psychosocial factors

Data from recent literature show that vaccine hesitancy is generally the result of an intuitive trade-off between perceived risks and benefits in the individuals concerned by vaccination, who are largely subject to cognitive biases. (Jocelyn Raude, February 2016). For a number of years, there has been a growing sense of reluctance linked to fears of side effects and a questioning of the usefulness of certain vaccines. (A.Balinskaab, 2007). A recent study shows that acceptance of the COVID-19 vaccine depends on the characteristics of new vaccines and the national vaccination strategy, among other factors, in the working-age population (Michaël Schwarzinger et *al.* 2021).

In a study of knowledge, attitudes and practices towards influenza in Morocco, it emerged that doctors were reluctant to be vaccinated or to advise on vaccination. The reasons for this attitude could be broadly divided into two categories: fear of side effects, and lack of hindsight (Majda Sebbani et al. 2009), yet the literature shows that influenza vaccination for healthcare staff reduces patient morbidity and mortality (Wicker, 2009b). Influenza vaccination rates among healthcare

professionals are universally low. Low vaccination coverage is thought to be due mainly to a lack of knowledge about the infection, fear of side effects, and doubt about the efficacy of influenza vaccination (Wicker, 2009a).

The Theory of Moral Sentiments (Adam Smith, 1759) states that however selfish man may be supposed to be, there are obviously principles in his nature that lead him to take an interest in the fate of others, and make their happiness necessary to him, even if he derives no personal benefit from it, apart from the pleasure of seeing it. Our mind then associates shame with any violation of the trust we've established. This theory reveals the importance of group life and its influence on the behavior of individual members. According to Kandel and Lazear (1992), the family is often in the best position to control and discipline its members. In other words, in certain contexts, peer pressure can be a relative solution to problems or behavior.

According to Fishbein and Ajzen's (1975) theory of reasoned action, the immediate predictor of a behavior is the person's intention to perform or not to perform a given action. The intention itself is a function of the attitude towards performing the behavior and the subjective norm that governs this situation. Attitude is determined by beliefs about the positive or negative consequences of performing the behavior.

Ajzen's (1991) theory of planned behavior is an extension of the theory of reasoned action, in which a complementary variable has been added: perceived behavioral control. According to this theory, an individual's behavior is determined directly by the intention to perform that behavior, the intention itself being determined by attitudes, social norms and behavioral control (Frédérike Limousi, 2015). Any behavior that requires planning can be predicted by the intention to perform that behavior (Sana El Harbi, 2009).

According to Gaston Godin (2012), the Health Belief Model (HBM) first appeared around 1950. It was originally formulated to explain why people would or wouldn't take a screening test for asymptomatic diseases, and then to understand the behaviors associated with disease prevention. The HBM assumes that an individual is likely to take action to prevent an unpleasant disease or condition if he or she possesses minimal health knowledge and considers health an important dimension of life.

2. Methods

A mixed-methods study was carried out in the Ngaoundere Urbain health district, Adamawa region, Cameroon. A stratified random sampling was conducted including the 30 Health Facilities (HF) (04 publics and 26 privates) of the district. A questionnaire was designed, pre-tested and administered face-to-face to participants. Data analysis was carried out jointly using RStudio software and Microsoft Excel 2016 spreadsheet software.

The proportions of the sample by stratum were calculated according with the proportions of these strata in the target population. These proportions are shown in the table below:

Table 1: Sample proportions by stratum in Ngaoundere Urbain health district

Strata	Total population	Accessible population	Target population	Proportion in target population (%)	Sample size
Strate 1: category 3 HF	445	445	345	62.4	35
Strate 2: category 4 HF	120	120	70	12.7	7
Strate 3: category 5 HF	50	50	45	8.1	5
Strate 4: category 6 HF	421	414	93	16.8	9
Total	**1036**	**1029**	**553**	**100**	**56**

3 Results

3.1 Contextual factors

3.1.1 Lifestyle

Healthcare workers' knowledge of the nature of COVID-19 is shown in the figure below:

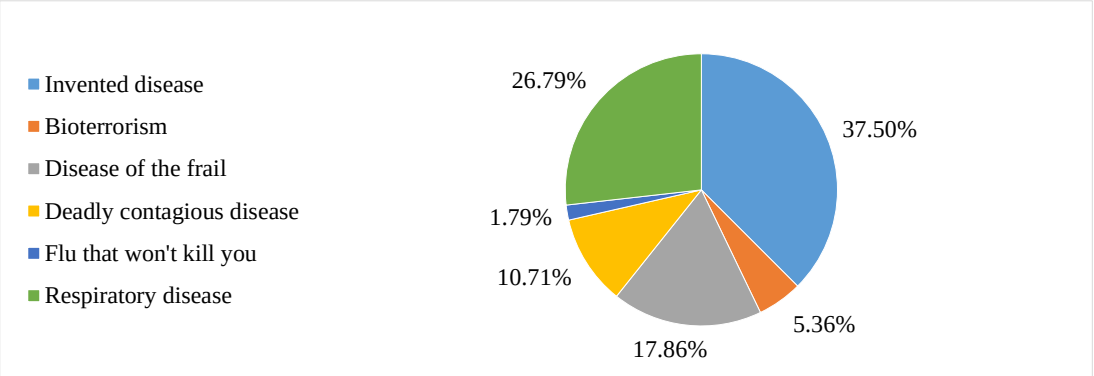

Figure 1: Staff knowledge of the nature of COVID 19

Concerning knowledge of the nature of COVID-19, 21 (37.50%) participants thought it was an invented disease, 15 (26.79%) thought it was a respiratory disease and 10 (17.86%) thought it was a disease that only affected people in poor health. Only 3 (5.36%) thought it was bioterrorism.

History of COVID 19 diagnosis and level of care received

Of the 56 people surveyed, 39 (69.64%) have already received at least one positive diagnosis of COVID-19 and the levels of care received by these people are presented in the figure below:

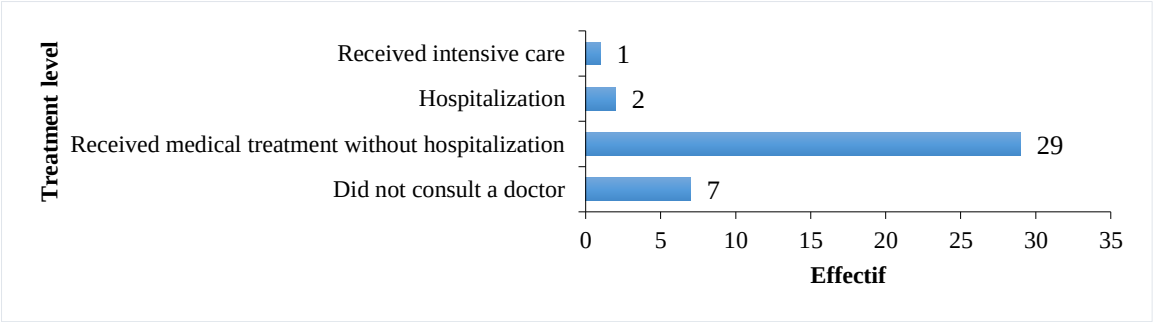

Figure 2: Levels of care received by people with a history of COVID-19

Of the 39 people with at least one positive COVID-19 diagnosis, 29 (74.36%) received outpatient medical treatment and only 1 (2.56%) received intensive care.

Presence of co-morbidities among those surveyed

Of the 56 people who took part in the study, 45 (80.36%) had no comorbidities, and the distribution of comorbidities observed in those who did is shown in the figure below:

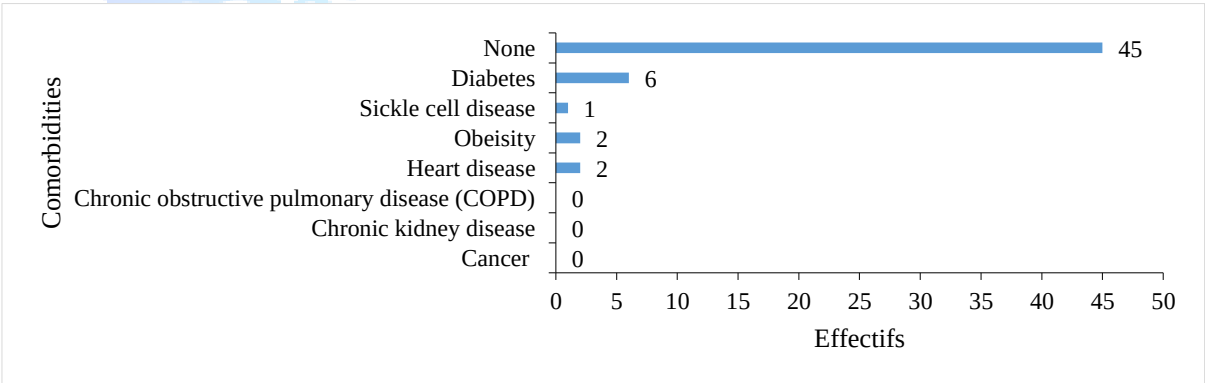

Figure 3: Comorbidities observed in the people surveyed

The most common comorbidities were diabetes with 6 (54.55%) cases, followed by heart disease and obesity with 2 (18.18%) cases each.

Attitudes towards receiving vaccines other than COVID-19

Almost all those surveyed said they receive vaccines other than COVID-19 as a means of preventing disease.

3.1.2 Administrative policies

Level of confidence in the Ministry of Public Health

The level of trust placed in the Ministry of Public Health by health personnel is shown in the figure below:

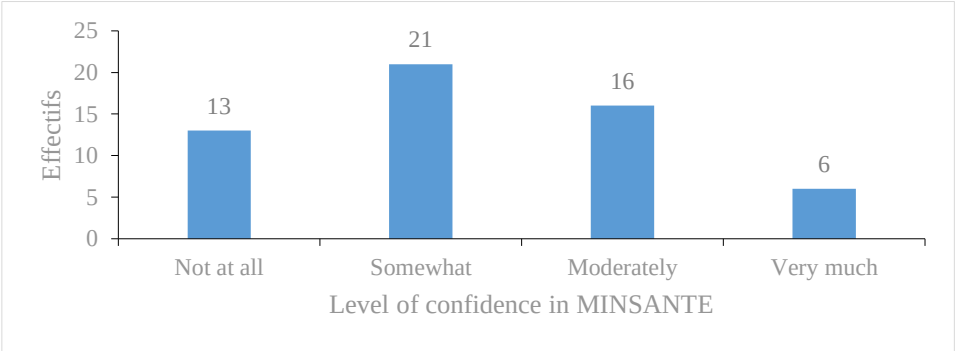

Figure 4: Level of trust in the Ministry of Public Health by healthcare workers

Of the 56 people surveyed, 21 (37.50%) have confidence in the Ministry of Public Health which recommended vaccination against COVID-19 as a means of preventing the disease, and 13 (23.21%) have no confidence at all in the Ministry of Public Health. Only 6 (10.71%) staff have a great deal of confidence in the Ministry of Public Health.

Level of confidence in WHO

Of the 56 people surveyed, 23 (41.07%) had **no** confidence at all in the WHO's recommendation to implement vaccination against COVID-19 as a means of preventing the disease. However, 16 (28.57%) and 13 (23.21%) health workers have **a little** and **moderate** confidence in the WHO, respectively. Only 4 (7.14%) people have a **lot of** confidence in WHO.

Perception of the choice of national vaccination policy COVID-19

The perceptions of the healthcare workers surveyed on the factors that influenced the choice of the country's vaccination policy are shown in the figure below:

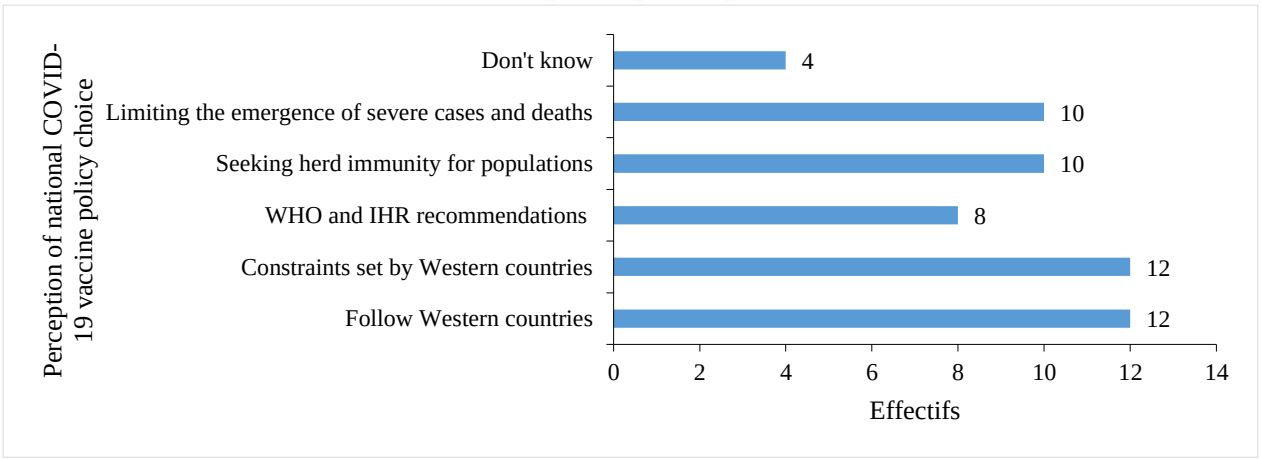

Figure 5: Perception of the choice of national vaccination policy COVID

A total of 24 (42.85%) healthcare workers surveyed think that the national vaccination policy against COVID-19 adopted by MINSANTE was guided by the constraints set by Western countries. In addition, 20 (35.71%) of the healthcare

personnel surveyed think that the choice of vaccination policy was guided by the desire to achieve collective immunity for the population, and to limit the emergence of serious cases and deaths.

Perception of the choice of WHO COVID vaccine policy

The perceptions of the healthcare staff surveyed on the factors influencing the choice of WHO vaccine policy are shown in the figure below:

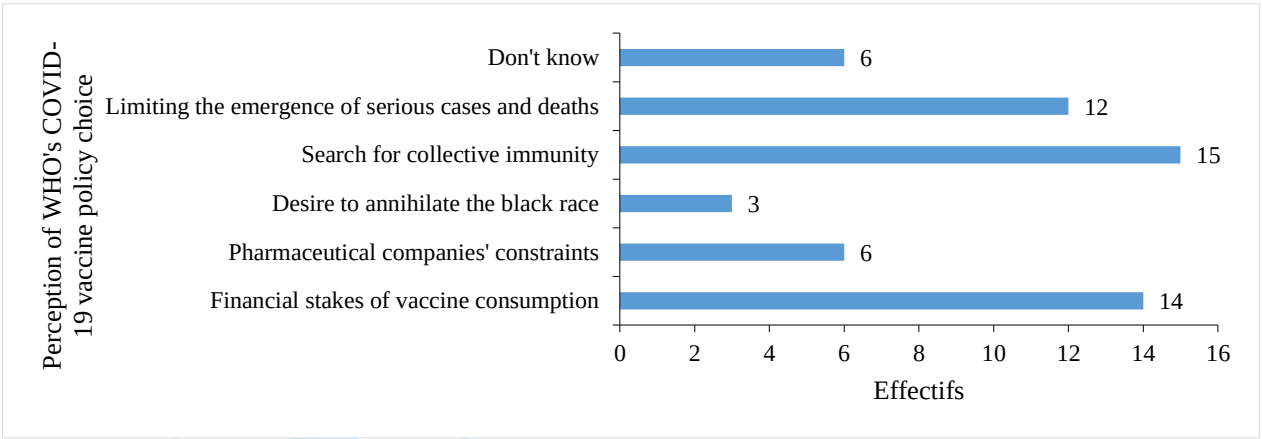

Figure 6: Perception of the choice of WHO COVID-19 vaccine policy

Of the 56 healthcare workers surveyed, 15 (26.79%) think that the WHO's COVID-19 vaccination policy was geared towards achieving collective immunity for the population, while 12 (21.40%) think it was aimed at limiting the emergence of severe cases and deaths. Also, 14 (25,00%) think that this policy is oriented by the financial stakes linked to the consumption of vaccines and 6 (10,71%) think that it is the fruit of the constraints of pharmaceutical firms. Only 3 (%) people think that this policy is driven by the desire to wipe out the black race.

Perception of non-compulsory vaccination COVID-19

Among the healthcare workers surveyed, 36 (64.29%) think that free vaccination was very important, and only 4 (7.14%) think it was not important.

Perception of free COVID-19 vaccination

Of the healthcare workers surveyed, 43 (76.79%) think that free vaccination was very important, and only 2 (3.57%) think it was not important.

Influence of vaccination policy on the adoption of vaccination behavior

A total of 28 (50.00%) healthcare workers surveyed think that vaccination policy could have a major influence on the adoption of vaccination behavior.

3.1.3 Media information

The most reliable sources of information about COVID-19 vaccination

The most reliable sources of information on COVID-19 vaccination used by the healthcare personnel surveyed are shown in the figure below:

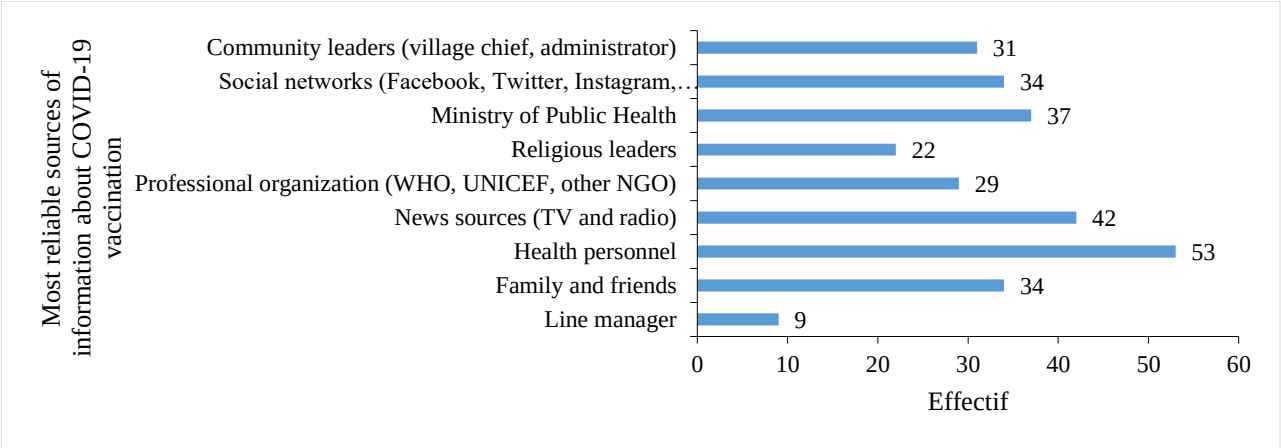

Figure 7: Most reliable sources of information on COVID-19 vaccination

When asked which are the three most reliable sources of information on COVID-19 vaccination, 53(94.64%) of healthcare workers surveyed said they trusted the information conveyed by healthcare workers most, followed by 42 (75.00%) for television and 37 (66.07%) for the Ministry of Public Health. Nonetheless, 34 (60.71%) of healthcare staff also claim to use social networks as a reliable source of information on COVID-19 vaccination, and conversely, the least reliable channel for information on vaccination is the hierarchical superior.

Influence of information received on adoption of vaccination behavior

The level of influence of information received on the adoption of vaccination behavior is shown in the figure below:

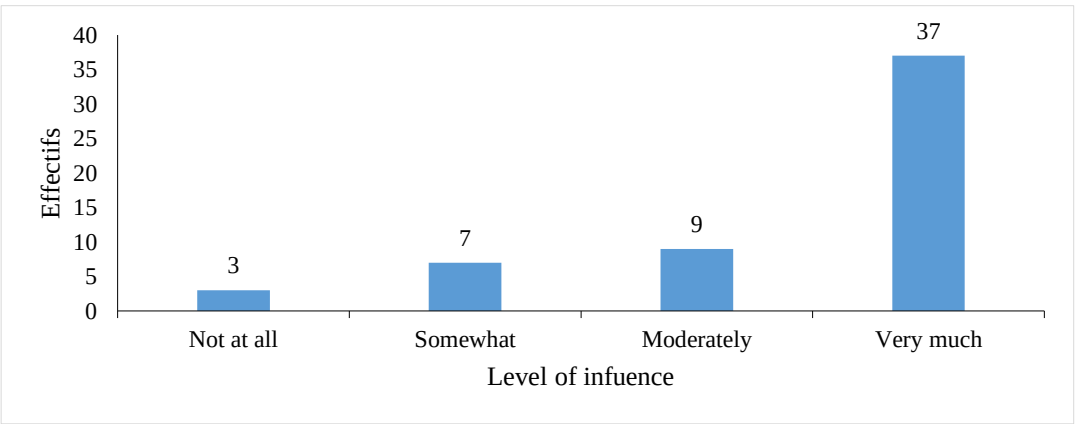

Figure 8: Level of influence of information received, adoption of vaccination behavior

In all, 37 (66.07%) of the healthcare professionals surveyed felt that the information they received could have a significant influence on their vaccination behavior.

3.2 Psychosocial factors

3.2.1 Perceptions of the vaccine

Perception of the role of the COVID-19 vaccine

Almost all those surveyed had heard of the COVID-19 vaccine. The figure below shows their perceptions of the role of the COVID-19 vaccine:

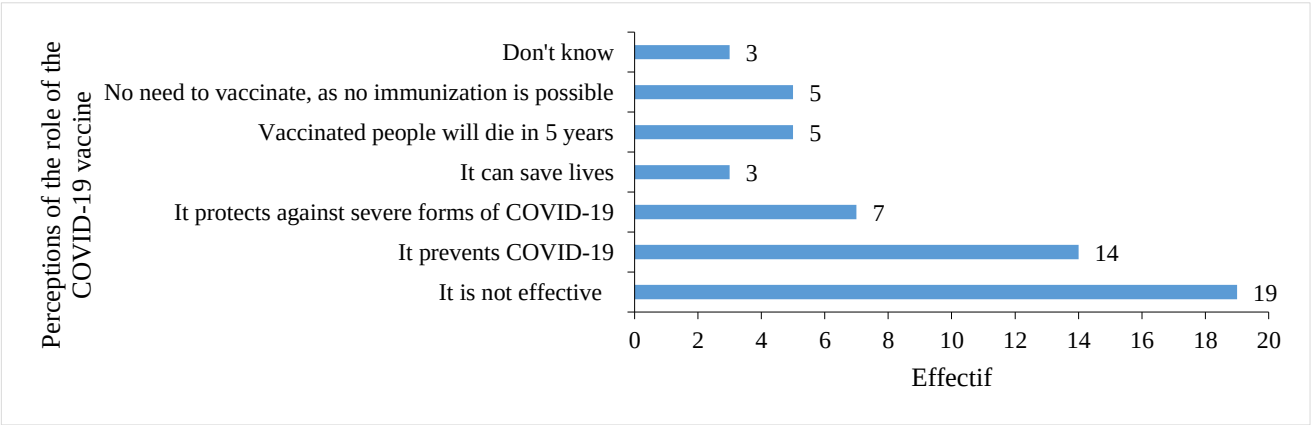

Figure 9: Perception of the role of the COVID-19 vaccine

Of the 56 healthcare workers surveyed, 19 (33.93%) thought that the COVID-19 vaccine was not effective, 5 (8.93%) thought that vaccinated people would die in 5 years' time, and 5 (8.93%) thought that there was no need to be vaccinated against COVID-19, as there was no possible immunity against the disease. Nevertheless, 14 (25.00%) healthcare workers think that the COVID-19 vaccine prevents COVID-19 and 7 (12.50%) protects against severe forms of the disease.

Perception of the usefulness of COVID-19 vaccination

At the end of the survey, only 30 (53.57%) healthcare workers thought that vaccination against COVID-19 was useful, and 26 (46.43%) thought that it was not.

Average perception of the efficacy of vaccines against severe forms of the disease

The figure below shows the perceptions of surveyed health personnel on the average efficacy of vaccines used against COVID-19 in the health district.

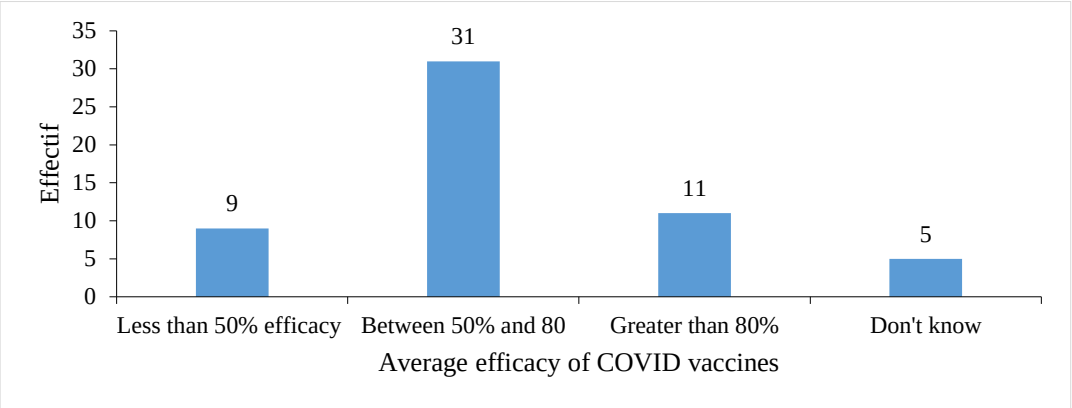

Figure 10: Average perception of vaccine efficacy against severe forms of the disease

The results show that 31 (55.36%) of the staff surveyed think that the average effectiveness of the vaccines used in the health district varies between 50% and 80%, 11 (19.64%) think that this effectiveness is greater than 80% and 9 (16.07%) think that it is less than 50%.

Perceptions of adverse reactions to COVID-19 vaccines

Like any drug, the COVID-19 vaccine has side effects. The perceptions of the healthcare personnel surveyed on the sidee effects caused by COVID-19 vaccines are presented in the figure below:

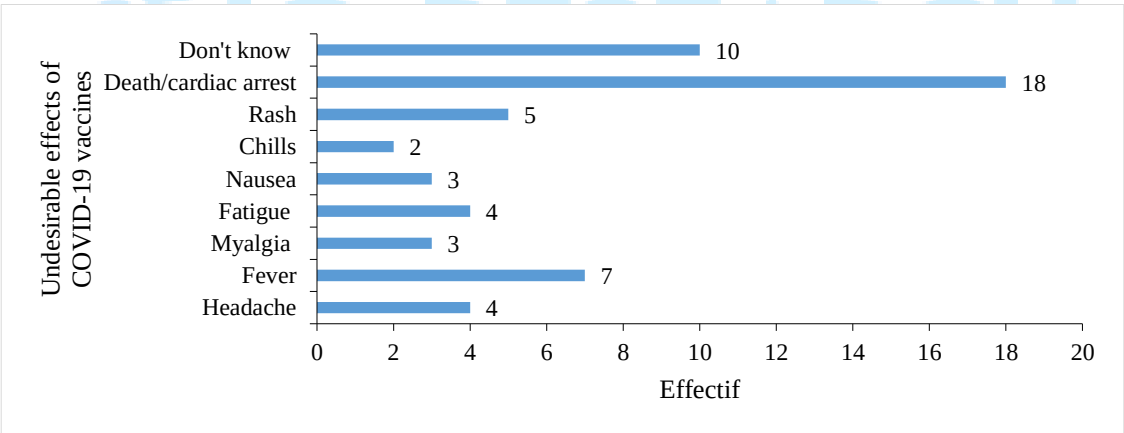

Figure 11: Perceptions of adverse reactions to COVID-19 vaccines

Of the 56 healthcare workers surveyed, 18 (32.14%) thought that one of the side effects caused by the administration of a COVID-19 vaccine was cardiac arrest or death, and 10 (17.86%) were not even aware of the side effects caused by the administration of these vaccines. The other healthcare personnel surveyed (50%, n=28) were split between fever (12.50%, n=7), rash (8.93%, n=5), fatigue and headache (each with 7.14%, n=4), nausea and myalgia (each with 5.36%, n=3) and chills (3.37%, n=2).

Perceived likelihood of remediation of adverse vaccine reactions

When asked whether or not the side effects caused by the administration of COVID-19 vaccines are curable, healthcare personnel expressed their opinions, which are presented in the figure below:

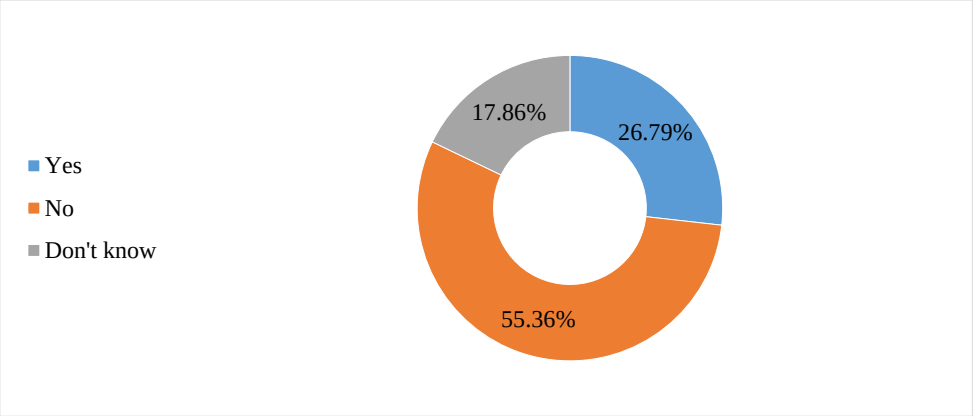

Figure 12: Perceived likelihood of remediation of COVID-19 adverse events

Of the 56 people surveyed, 31 (55.36%) thought that the side effects caused by the administration of COVID-19 vaccines were not remediable at all, 15 (26.79%) thought that these effects were remediable, and 18 (17.86%) knew absolutely nothing about them.

3.2.2 Vaccination-related behavior

Perception of the possibility of being vaccinated

In order to understand the choice to adopt a vaccination behavior, we asked what the possibilities were for unvaccinated health workers to receive a vaccine against COVID-19. The level of difficulty in receiving vaccines is presented in the figure below:

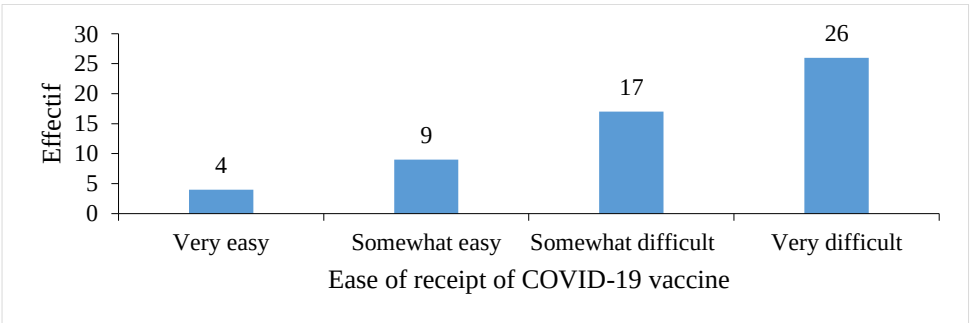

Figure 13: Perception of the possibility of being vaccinated

The results show that 43 (76.78%) of the healthcare workers surveyed thought it would be a little difficult or very difficult for them to accept a COVID-19 vaccine. On the other hand, only 13 (32.21%) healthcare workers thought it would be a little easy or very easy for them to receive the COVID-19 vaccine.

Concerns about serious effects caused by COVID-19 vaccine

Healthcare workers' perceptions of the levels of concern about serious effects likely to be caused by receiving a COVID-19 vaccine are presented in the figure below:

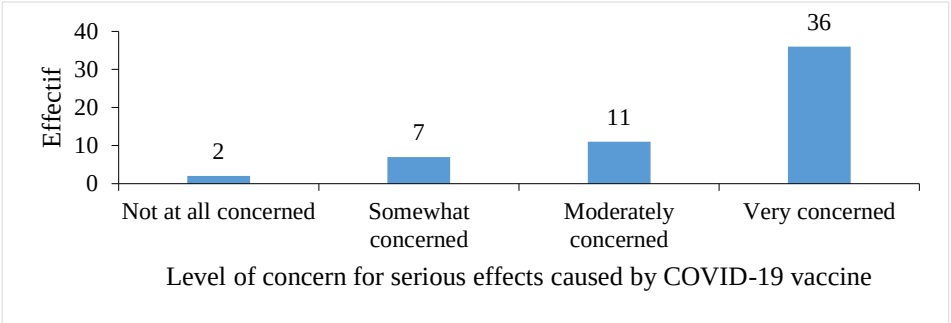

Figure 14: Concerns about serious effects caused by the COVID-19 vaccine

The results show that 47 (83.92%) of the healthcare workers surveyed are moderately and very concerned, while only 9 (16.07%) are somewhat and not at all concerned about the serious effects of receiving the COVID-19 vaccine.

Perception of the safety of COVID-19 vaccines

To the question of how safe a vaccine could be, healthcare workers expressed themselves and their opinions are recorded in the figure below:

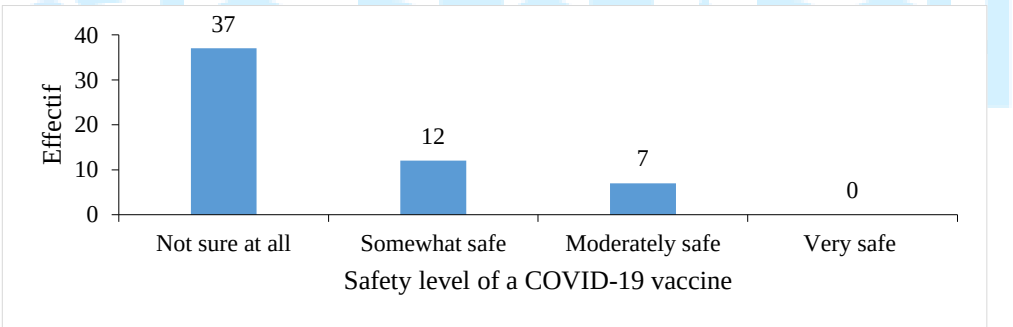

Figure 15: Perception of the safety of COVID-19 vaccines

Of the 56 healthcare workers surveyed, 37 (66.07%) thought that a vaccine against COVID19 would not be at all safe for them, 12 (21.43%) thought that a vaccine would be somewhat safe, and none of the healthcare workers surveyed thought that a vaccine would be very safe.

Factors favoring probable adherence to COVID-19 vaccination

The factors that are likely to encourage healthcare workers to take up vaccination against COVID-19 are shown in the figure below:

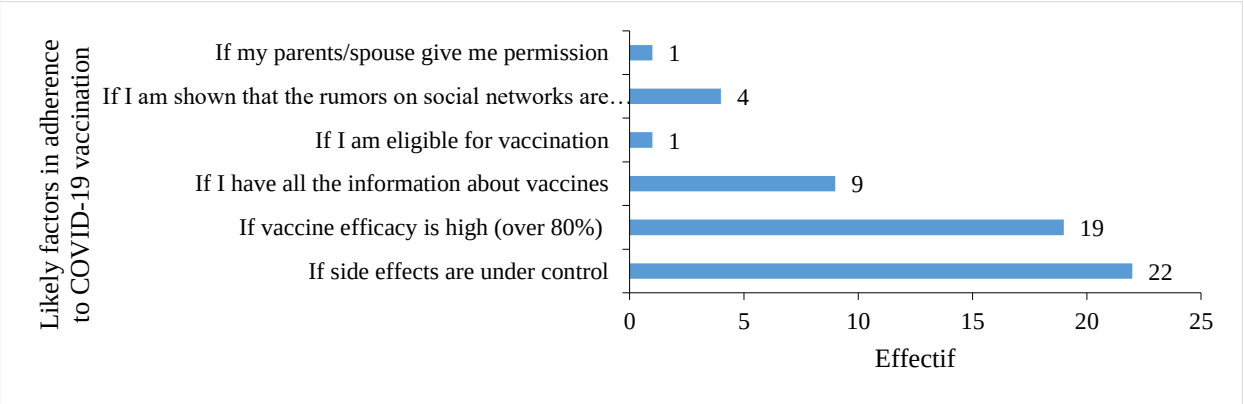

Figure 16: Factors favoring probable adherence to COVID-19 vaccination

With regards to the factors likely to encourage health-care workers to accept vaccination against COVID-19, 22 (39.29%) said they would accept vaccination if the side-effects associated with receiving the vaccine were under control, 19 (33.93%) if the vaccine's efficacy was over 80%, and 9 (16.7%) if they had all the information they needed about the vaccine. Also, 4 (4.14%) said they could receive the vaccine if they were shown that the rumors surrounding vaccination on social networks were unfounded.

3.2.3 Peer influence

Likelihood of vaccination uptake if recommended by vaccinated colleagues

The probability of vaccination uptake if recommended by vaccinated colleagues is shown in the figure below:

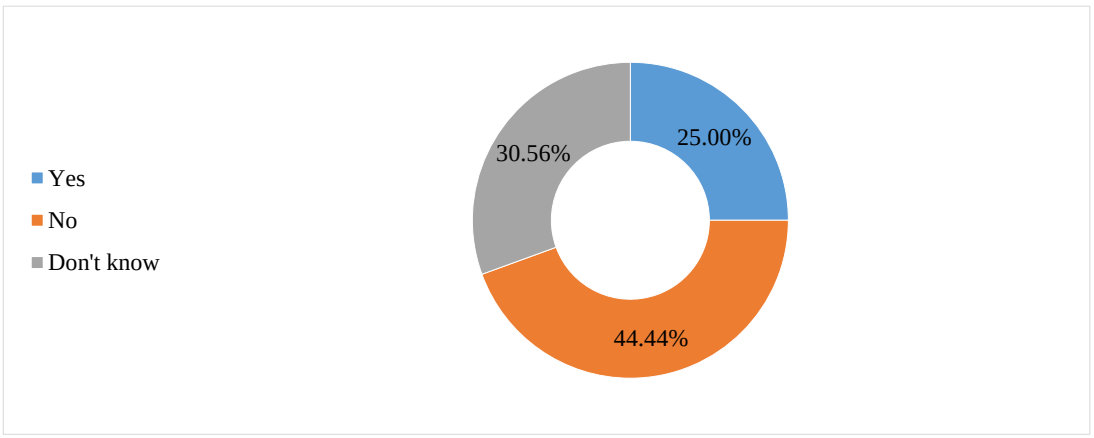

Figure 17: Probability of vaccination uptake if recommended by vaccinated colleagues

Of the 56 healthcare workers surveyed, 29 (51.79%) said they would be willing to undergo vaccination against COVID-19 if recommended to do so by colleagues who had themselves agreed to be vaccinated.

Likelihood of vaccination uptake if recommended by a supervisor vaccinated

The probability of adherence to vaccination against COVID-19 if recommended by a vaccinated supervisor is shown in the figure below:

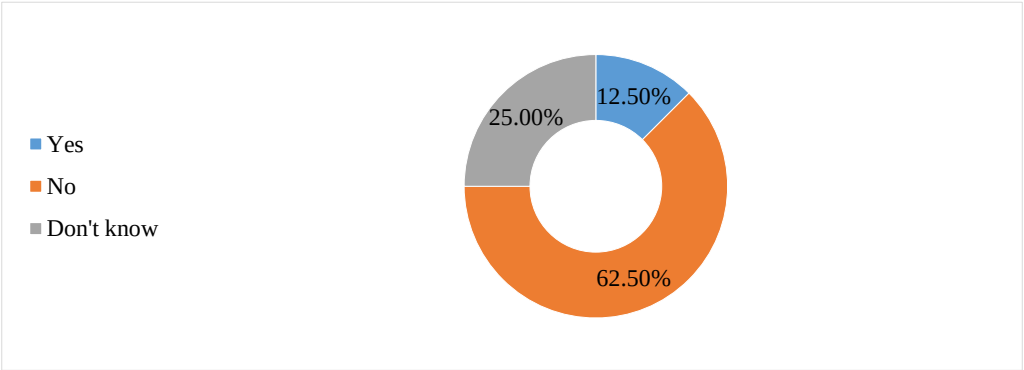

Figure 18: Likelihood of vaccination uptake if recommended by a line manager

Of the 56 healthcare workers surveyed, 35 (62.50%) said they would not take part in vaccination against COVID-19 if recommended by a superior, and only 7 (12.50%) said they would take part.

Likelihood of vaccination uptake if recommended by a vaccinated family member

The probability of adherence to vaccination against COVID-19 if recommended by a vaccinated family member is presented in the figure below:

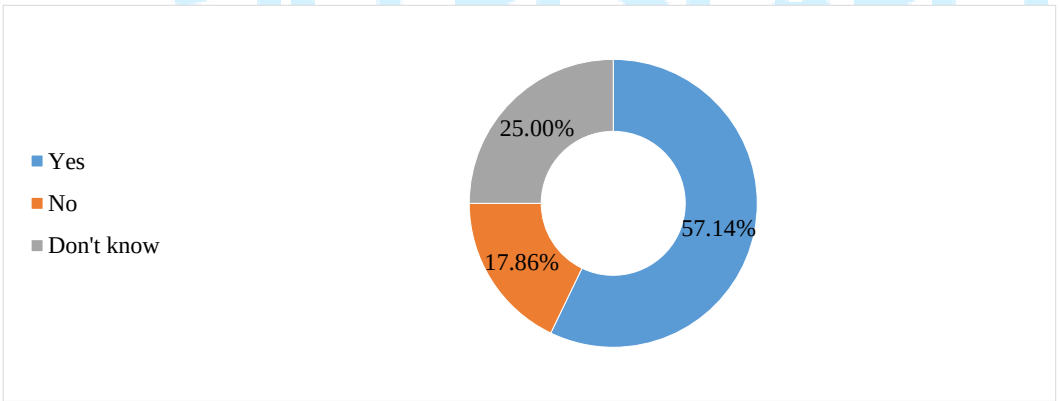

Figure 19: Likelihood of vaccination uptake if recommended by a family member

Of the 56 healthcare workers surveyed, 32 (57.14%) said they would take up vaccination against COVID-19 if recommended by a family member who had received the vaccine.

3.3. Verification of assumptions

Hypotheses were tested using the Student's *t-test* in order to identify the determinants of reluctance to vaccinate against COVID-19 among the healthcare workers surveyed and according to the different strata for an overall sample of 56 participants.

3.3.1 Testing the first hypothesis (Hr_1: contextual factors determine reluctance to COVID-19 vaccination among healthcare workers)

For the first hypothesis, comparison of means by Student's t test validated the hypothesis in 3 (75%) strata of our study, with the highest values in strate 2 (18.76) and strate 1 (13.48). The hypothesis was not validated in the last strate, which recorded a negative Student's *t* value (-2.023).

This shows that contextual factors account for 75% of reluctance to vaccinate against COVID-19 among staff in the Ngaoundere Urbain health district, with an accepted error threshold of 0.05%.

3.3.2 Testing the second hypothesis (Hr2: psychosocial factors determine reluctance to COVID-19 vaccination among healthcare workers)

Comparison of means by Student's t-test also validated the second hypothesis in 3 (75%) strata of our study, with the highest values in strate 4 (69.328) and strate 3 (64.126). The hypothesis was not validated in the first stratum, which recorded a negative Student's *t* value (-1.970).

This shows that psychosocial factors account for 75% of reluctance to vaccinate against COVID-19 among staff in the Ngaoundere Urbain health district, with an accepted error threshold of 0.05%.

4 Discussion

All participants indicated that they often receive vaccines other than COVID-19 for disease prevention. This suggests that they are not vaccine-skeptics. On the other hand, knowledge of the nature of COVID-19 disease was relatively low in our study population. This could explain the reluctance to vaccinate due to lack of information about the disease. These results corroborate those of Cristina Bianca Pocol, (2017), who had demonstrated that insufficient health education influences the adoption or non-adoption of vaccination.

These findings are similar to those of Jeremy K.Wardab et *al*, Avril (2020), who demonstrated that attitudes towards COVID-19 vaccines were significantly correlated with political partisanship and engagement with the political system. Jocelyn Raude, (2016), demonstrated that the growing crisis of confidence in public authorities in general and health authorities in particular are sociological phenomena that help to explain the growing number of controversies surrounding vaccination.

Healthcare workers fear side effects from receiving COVID-19 vaccines. These negative perceptions about the role of the vaccine contribute to a reluctance to vaccinate among said staff.

These results are in line with those of Wicker (2009a), who demonstrated that influenza vaccination rates among healthcare professionals are universally low due to a lack of knowledge about the infection, fear of side effects, and doubt about the vaccine's efficacy.

Likewise, they corroborate those set out in the Theory of Moral Sentiments by Adam Smith, (1759) who revealed the importance of group life and its influence on the behavior of individual members. In a similar study by Kandel and Lazear (1992), it is said that, like peers in the professional field, the opinion of family members and friends could influence the adoption of a behavior.

In short, intention to vaccinate is linked to behaviors and lifestyle. Our results are in line with those of G.L. Alexander et al, (2017), who had demonstrated in a study for the improvement of young people's food choices for weight control and disease prevention, that student life had a negative influence on the regularity of their meals, leading them to prefer not to eat rather than having to cook or choose a fast-food type food.

Conclusion

Since its inception, vaccination has never met with unanimous approval, despite its relevance to disease prevention. The present study identified the contextual and psychosocial determinants of reluctance to vaccinate against COVID-19 among staff in Ngaoundere Urbain health district. The pooling of three theoretical models (Theory of Reasoned Action, Theory of Planned Behavior and Health Belief Model) enabled the development of a measurement instrument used for data collection.

Correlational analysis of our factors led to the results: ($r = .8008$; $p < 0.01$), ($r = .4211$; $p < 0.05$), ($r = .6993$; $p < 0.01$), ($r = .4665$; $p < 0.05$). According to study strata, it was found that contextual and psychosocial factors contributed more to reluctance to COVID-19 vaccination among healthcare personnel.

This study could therefore be used as a decision-making tool to support the planning of interventions aimed at promoting vaccination as a means of preventing disease.

References

1. A.Balinskaab. (2007). Opinions and reservations about vaccination Attitude.
2. Adam Smith (1759). The Theory of Moral Sentiments.
3. European Medicines Agency. (December 2021). Press release on Pfizer/BioNTech COVID-19 vaccine.
4. Ajzen, I. (1991). The theory of planned behavior. *Organizational and Human Decision Processes.*
5. B.Becker (2021). Vaccination against COVID-19: between individual responsibility and moral sense.
6. Center de Coordination des Opérations et Urgences de Santé Publique/Ministère de la Santé Publique du Cameroun (June 2020). Situation Report n°5.
7. Center de Coordination des Opérations et Urgences de Santé Publique/Ministère de la Santé Publique du Cameroun, Rapport de Situation n°79, May 2021.

8. Comité sur L'immunisation du Québec (2021). Preliminary data on vaccine efficacy and complementary opinion on the vaccination strategy against COVID-19 in Quebec in a context of shortage.
9. Conseil Scientifique des Urgences de Santé Publique (CSUSP)/Ministère de la Santé Publique du Cameroun (May 2021). Opinion n°8 on priority targets for the first phase of vaccination in Cameroon.
10. Cristina Bianca Pocol (2017). How does lifestyle influence young people's Eating behaviors? A qualitative analysis.
11. Feldman, 1989. Health behaviors: Understanding for better intervention.
12. Fishbein, M. & Ajzen, I. (1975). Belief, attitude, intention and behavior: an introduction to theory and research. reading, Massachusetts: Addison-Wesley.
13. Frédérike Limousi (2013). Parents' reluctance to hepatitis B vaccination in France.
14. G.L. Alexander, N. Lindberg, A.L. Firemark, M.R. Rukstalis, C. McMullen. (2017). motivations of young adults for improving dietary choices: focus group findings prior to the menu geny dietary change trial.
15. Gaston Godin (2012). Health behaviors: Understanding for better intervention.
16. Gehanno J.F.et *al.* (2020). Arguments for possible airborne transmission of SARSCoV-2 in the COVID-19 crisis.
17. Georges Canguilhem (1966). The normal and the pathological.
18. Guido Giarelli, Ellen Annandale, Vololona Rabeharisoa, Graham Scambler, Clive Seale, Debra Umberson (2013). Sociological theory and sociology of health and medicine in international journals. *Institute of Psychology, Faculty of Social and Political Sciences, University of Lausanne*.
19. Jeremy K.Wardab et al (April 2020). French public attitudes towards a future COVID-19 vaccine: the politicization of a public health issue.
20. Jocelyn Raude (February 2016). Vaccine hesitancy: a psychosociological perspective.
21. Kandel and Lazear, 1992, Peer Pressure and Partnerships, Journal of Political Economy, p802
22. Majda Sebbani et al (2009) Connaissances, attitudes et pratiques à l'égard de la grippe A H1N1 : Enquête auprès des médecins en formation au CHU Mohammed V I, Marrakech.
23. Michaël Schwarzinger, Verity Watson, Pierre Arwidson, François Alla, Stéphane Luchini (2021). COVID-19 vaccine hesitancy in a representative working-age population in France:
a survey experiment based on vaccine characteristics.
24. Minister of Public Health Cameroon (06 March 2020). Press release N° 45.
25. World Health Organization. (1946). Preamble to the Constitution of the World Health Organization. *Actes officiels n°2, p.100.*
26. World Health Organization. (May 28, 2022). Report of the Seventy-fifth World Health Assembly: resolutions and decisions
27. Paul Robert, A. Rey & J. Rey-Debove (2011). Alphabetical & analogical dictionary of the French language LE ROBERT. *New edition. ISBN 978-2-32101-656-4*.

28. Roy B. et *al*. (2021). Global variants of COVID-19: Current understanding.
29. Sana El Harbi (2007). Ajzen's (1991) theory of planned behavior: Empirical application to the Tunisian case.
30. Saravanakarthikeyan Balasubramanian & Divya Vinayachandran (2021). Bioaerosols from mouth breathing: little-known mode of transmission of COVID-19.
31. Regional Incident Management System COVID-19 of Adamaoua. (June 2021). Status Report n°16.
32. Regional Incident Management System COVID-19 of Adamaoua. (June 2022). Regional evaluation report of the COVID-19 response.
33. Wicker S. (2009a.). Influenza vaccination compliance among health care workers in a German university hospital. Infection.
34. Wicker S. (2009b). Vaccination against classical influenza in health-care workers: selfprotection and patient protection.
35. Yaya Sangare et al (June 2020). Comparative study of psychosocial determinants of polio vaccination in Kabalabougou and Sangarebougou.
36. World Health Organization. (2020). https://www.who.int/fr/news-room/q-a detail/coronavirus-disease-covid-19, Coronavirus disease 2019 (COVID-19): what you need to know. Accessed on 26/09/2023 at 22 hours.
37. World Health Organization. (2021a). https://www.who.int/fr/news-room/q-a detail /vaccinesand-immunization-what-is-vaccination. Accessed 09/25/2023, 9pm.

World Health Organization. (2021b). https://www.who.int/fr/emergencies/diseases /novel coronavirus-2019/covid-19-vaccines, the race to vaccinate against COVID-19. Accessed on 25/09/2023 at 21 heures 5min.