

*Full Length Research Paper*

# Vaccination against COVID-19: Study of factors limiting the adherence of health professionals in Burkina Faso

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**Vaccination is the ultimate solution as a preventive measure to stop the COVID-19 pandemic. In Burkina Faso, following the adoption of this strategy, health authorities encountered reluctance on the part of the population and even health professionals to adhere to it. This study aims to assess the factors associated with this reluctance to vaccinate against COVID-19 among health professionals. A cross-sectional analytical study of factors limiting health professionals' adherence to COVID-19 vaccination was carried out. The study population concerned health professionals over the age of 18 working in health centers in the city of Ouagadougou. The age group from 25 to 35 years old was the most represented (46.45% among 408 health professionals). The respondents had all heard of COVID-19 and its vaccines, had a good knowledge of signs of the disease and only 48.24% had been vaccinated. Perceived risk of the disease ( $p=0.000$ ) and confidence in the vaccine ( $p=0.000$ ) were factors associated with adherence or non-adherence to COVID-19 vaccination. Improving adherence to COVID-19 vaccination requires strengthening the capacity of healthcare professionals, which in turn will improve the acceptability of others.**

**Key Words:** COVID-19, vaccination, hesitation, health professionals, Burkina Faso.

## INTRODUCTION

The first case of the new coronavirus was reported in the Chinese city of Wuhan in December 2019. On March 11, 2020, coronavirus disease 2019 (COVID-19) officially became a pandemic according to the World Health Organization (WHO). Most countries have confirmed cases and deaths, jeopardizing living conditions and substantially impacting economies (Rey and Dare, 2020).

Following recognition of the role of large-scale vaccination as a global public health objective by the WHO to prevent, contain, and stop the transmission of SARS-CoV-2 in May 2020, several countries, including Burkina Faso, have joined the idea of carrying out massive vaccination campaigns against this disease (Machingaidze and Wiysonge, 2021). Burkina Faso

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recorded its first cases on March 9, 2020, and since then, COVID-19-related morbidity and mortality have continued to grow (World Health Organization, 2020). Like the rest of the world, Burkina Faso, with the help of its partners, introduced free vaccination in 2021 (Organisation Mondiale de la Santé, 2021). This vaccination has not been as successful as expected, so intensification campaigns have been carried out to achieve a vaccination rate of 10% (Yameogo et al., 2022).

In sub-Saharan countries, management of an epidemic and more specifically of the COVID-19 pandemic, depends on the approval of vaccines but also, and above all, on their acceptance by healthcare professionals, as they play a key role in promoting vaccination among the general population.

The aim of this research is to contribute to the improvement of COVID-19 vaccination coverage among healthcare professionals in Burkina Faso. In fact, to facilitate vaccine acceptance, it is essential to understand levels of vaccine skepticism and the demographic, psychological, and social factors that predict them. On this basis, factors associated with health professionals' adherence to COVID-19 vaccination will be identified.

## MATERIALS AND METHODS

### Study type, period, and population

This consists of a cross-sectional analytical study and data which were collected during the period from December 4 to 23, 2023. The study concerned 408 health professionals over 18 years old working in health centers in the city of Ouagadougou.

### Sampling and data collection tools

A non-probability sampling was used, and data was collected using a digitized questionnaire with Google Forms. This questionnaire was administered to healthcare professionals in a one-on-one interview for some, and online via a link shared by WhatsApp for others.

### Operational definitions and variables

Vaccination status as a dependent variable was considered. Vaccination status is a dichotomous variable and is defined in this study as "vaccinated" for those who accept COVID-19 vaccination and "unvaccinated" for those who refuse it.

The independent variables related to socio-demographic factors as well as awareness of the disease, knowing the signs of the disease, knowing the vaccines, knowing the preventive measures, knowing the transmission of the disease, and confidence in the vaccine (it is about trusting or not trusting the COVID-19 vaccine).

### Data collection and analysis

Data entry was performed using Excel software. Data consistency

was checked and outliers were corrected. Data was analyzed using R software. Quantitative variables were described by their mean followed by their standard deviation if the distribution was normal, and by their median (with minimum and maximum) if the distribution was asymmetrical. Qualitative variables were described by their frequency. The Pearson Chi-square test ( $\chi^2$ ) was used to test the existence of associations between categorical variables. The association was considered significant for a p-value below 0.05. The Hosmer Lemeshow test was used to test for adequacy at the 5% threshold.

The bivariate analysis mainly concerned variables such as vaccination status, age, sex, level of education, occupation, knowledge of the disease, confidence in vaccines, and type of hospital. After this analysis, independent variables with a significant association at the 5% threshold were retained. To measure the strength of association between variables, Odds Ratio (OR) with a 95% confidence interval was used. For the multivariate analysis, a logistic regression model was chosen. The results of the bivariate analysis to establish a model were used, introducing independent variables retained in the multivariate analysis.

### Ethical consideration

Informed consent was obtained for all study participants and anonymity was ensured during data management and analyses (by assigning codes to each respondent before transcription of interviews). Approval from the Regional Directorate of Health and Public Hygiene (DRSHP) of the Center region to conduct the research was obtained.

## RESULTS

### Socio-demographic characteristics

The average age of the interviewed people was 32.59 years. 408 health professionals aged between 18 and 71 years old participated in the study. Women were the most represented with a percentage of 56.48%. The majority of healthcare professionals surveyed came from public services (56.47%), and nurses were the most represented with 31.54%. More than half of the healthcare professionals surveyed were married (52.08%) are shown in Table 1.

Moreover, healthcare professionals surveyed had already heard of COVID-19 and its vaccines before the study. They knew that the disease was transmissible by respiratory route (93.8%) and were familiar with barrier measures such as wearing a mask (97.8%).

Adherence to vaccination increased with the level of education. However, nurses were more likely to adhere to vaccination (35.53%) (Table 2).

### Vaccination rate

Only 48.24% of healthcare professionals claimed to be vaccinated against 51.71% unvaccinated. The most motivating reasons for vaccination were "to protect

**Table 1.** Socio-demographic characteristics of health professionals

<b>Variable</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Age (Years)</b>		
[18 ; 25[	92	22.49
[25 ; 35[	190	46.45
[35 ; 45[	84	20.53
[45 ; 55[	40	9.77
[55 ; 65[	2	0.48
[65 ; 75[	1	0.24
<b>Sex</b>		
Men	178	43.52
Women	231	56.48
<b>Educational level</b>		
Primary level	7	1.71
Secondary school	172	42.05
University	230	56.23
<b>Marital status</b>		
Single	195	47.68
Married	213	52.08
Divorced	1	0.24
<b>Profession</b>		
Medical doctors	58	14.18
Nurses	129	31.54
Midwives	74	18.09
Paramedical workers	100	24.45
Other health professionals	48	11.74
<b>Hospital type</b>		
Private	178	43.51
Public	231	56.47

Source: Field survey (December 2023).

**Table 2.** Distribution of health professionals by vaccination status

<b>Variables</b>	<b>Adherence to vaccination (%)</b>	
	<b>Yes (N=197)</b>	<b>No (N=211)</b>
<b>Age (Years)</b>		
[18; 25[	16.24	27.96
[25; 35[	49.75	43.60
[35; 45[	21.83	19.43
[45; 55[	11.68	8.06
[55; 65[	0.51	0.47
[65; 75[	0	0.47
<b>Sex</b>		
Men	51.27	36.02

**Table 2.** Cont'd

Women	38.58	63.98
<b>Educational level</b>		
Primary level	0.51	2.84
Secondary school	34.01	49.76
University	65.48	47.39
<b>Marital status</b>		
Single	41.62	53.08
Married	57.87	46.92
Divorced	0.51	0
<b>Profession</b>		
Medical doctors	16.75	11.37
Nurses	35.53	27.96
Midwives	22.84	13.74
Paramedical workers	17.77	30.81
Other health professionals	7.11	16.11
<b>Hospital type</b>		
Private	36.55	50.24
Public	63.45	49.76

Source: Field survey (December 2023).

**Table 3.** Reasons having motivated the vaccination among health professionals

Motivations to get vaccinated	Frequency	Percentage (%)
Protection against COVID-19	168	41.07
Availability of the vaccine	54	13.20
To travel	63	15.40
Free vaccine	31	7.58
Government recommendation	55	13.45

Source: Field survey (December 2023).

against COVID-19" (41.7%), and "for travel purposes" (15.40% (Table 3)).

### Reasons for getting vaccinated

The most motivating reasons for vaccination were "to protect against COVID-19" (41.7%), "for travel purposes" (15.40% (Table 3)).

### Reasons for refusing to get vaccinated

The main reasons for reluctance to vaccinate were "fear of vaccine side effects" (42.05%) and "waiting for further

information on the vaccine" (12.71%) (Table 4).

### Associated factors

Disease risk perception and vaccine confidence were independent factors in adherence to COVID-19 vaccination. Indeed, compared with vaccine-trusting individuals, those who did not trust the vaccine were 0.05 times less likely to be vaccinated against COVID-19. (OR= 0.05[0.03-0.010]) (Table 5).

The results from the multinomial logistic model show that there are factors that can explain the acceptability of the COVID-19 vaccine, namely the healthcare professional's level of education, profession, gender, type

**Table 4.** Reasons explaining the refusal of the vaccination among health professionals

Reasons about refusing vaccine	Frequency	Percentage (%)
Common disease	14	3.42
Fear of side effects	172	42.05
Waiting for many people to get vaccinated	21	5.13
Waiting for further information on the vaccine	52	12.71
Not getting vaccinated for medical reasons	24	5.87

Source: Field survey (December 2023).

**Table 5.** Multinomial logistic coefficients with confidence and significance intervals

Term	Estimate	Std. error	Statistic	P.value	Conf. low	Conf. high	Significance
(intercept)	0.83	1.39	-0.14	0.89	0.05	12.56	-
Hospital type (public)	1.78	0.32	1.82	0.07	0.96	3.31	-
Level of education (High school)	2.50	1.40	0.65	0.51	0.16	39.08	-
Level of education (university)	6.40	1.40	1.32	0.19	0.41	100.03	-
Gender (male)	2.52	0.32	2.89	0.00	1.35	4.72	**
Profession (nurse)	2.25	0.49	1.66	0.10	0.87	5.84	-
Professional (medical doctor)	1.38	0.59	0.55	0.58	0.44	4.37	-
Professional (paramedical worker)	0.97	0.51	-0.05	0.96	0.36	2.62	-
Profession (midwife)	3.86	0.56	2.42	0.02	1.29	11.52	*
Confidence in the vaccine (I don't trust)	0.05	0.30	-9.73	0.00	0.03	0.10	***
High risk	0.51	0.42	-1.64	0.10	0.22	1.14	-
Low risk	0.18	0.40	-4.27	0.00	0.08	0.39	***
Medium risk	0.22	0.45	-3.36	0.00	0.09	0.53	***

Source: Field survey (December 2023).

**Table 6.** Variance analysis (Type II tests) with significance

Variable	LR Chisq	Df	Pr(>Chisq)
Hospital type	3.35	1	0.07
Level of education	9.93	2	0.01
Sex	8.63	1	0.00
Profession	12.59	4	0.01
Confidence in vaccine	126.51	1	0.00
Risk	23.98	3	0.00

Source: Field survey (December 2023).

of hospital where he or she works, risk of being infected, and confidence in vaccines (Table 6).

## DISCUSSION

The result of the current study demonstrated that 48.24% of professionals surveyed were vaccinated so this result

agreed with other studies done in other places. In fact, a study conducted by Sogodogo in 2022 reported a vaccination rate of 38.84% in Mali (Sogodogo, 2022). In Tunisia, Snène et al. (2022) found a higher vaccination rate among nursing staff (83.5%) (Snène et al., 2022).

The moderate vaccination coverage in this study could be explained by the strong reluctance to COVID-19 vaccination in the general population. 51.71% of

respondents claimed not to be vaccinated against COVID-19. A study conducted in France and Senegal reported lower rates of reluctance to COVID-19 vaccination (28.4% and 5.1% respectively) among healthcare professionals (Fall et al., 2021). The primary reason for vaccine reluctance was fear of side effects (42.05%) (Table 4). This highlights doubts about the efficacy and safety of vaccines. These results go in line with those of Salam et al. (2021) in Burkina Faso, where fear of side effects was cited as a reason for declining vaccination. The second reason cited was the lack of information on vaccines (12.71%) (Table 4) to counter misinformation on social networks. According to the SAGE Working Group on Vaccine Hesitancy, poor communication can be detrimental to vaccine acceptance (MacDonald and SAGE, 2015).

### Associated factors

Vaccination acceptance was statistically related to perceived disease risk and confidence in COVID-19 vaccines. According to the 5c model, complacency and confidence are a history of vaccination. Complacency arises when the danger posed by the disease is perceived as low (Betsch et al., 2018).

Those who believe they have a low risk of being infected by the disease are not vaccinated. Similarly, the majority of those who felt they were at high risk of infection were vaccinated. The desire to protect oneself appeared to be a motivating factor for those who were vaccinated. On the contrary, people who refused vaccination tended to feel invulnerable to the disease (Lecroart et al., 2021). Studies in several countries have shown that perception of the risk of COVID-19 infection was associated with adherence or non-adherence to vaccination (Biswas et al., 2021; Kouassi et al., 2022).

Confidence in COVID-19 vaccines was also associated with vaccine refusal. Mistrust of the COVID-19 vaccine may stem from a lack of trust in governments, as vaccination is generally a government-led public health intervention. The rapid development, licensing, and implementation of COVID-19 vaccines has raised concerns about vaccine safety and efficacy (Lucia et al., 2021; Shaw et al., 2021). Confidence in the safety of vaccines has thus been called into question. In the sample, many healthcare professionals expressed doubts and mistrust about vaccination against SARS-CoV-2, and this lack of confidence had an impact on their adherence to vaccination.

### LIMITATIONS

The authors were unable to conduct a mixed-methods study, including a qualitative component to better identify

factors associated with vaccine intention among the respondents, as well as the reasons for vaccine refusal. Such information could be used to improve strategies for better adherence and acceptable vaccination coverage.

### CONCLUSION

Vaccine hesitancy among healthcare professionals is a matter of concern, as they play a key role in promoting vaccination within the general population. Therefore, understanding the factors that influence their adherence to COVID-19 vaccination is essential for developing strategies to improve vaccine acceptance and coverage in the general population.

This research and the results it underpins contribute to a better understanding of epidemics in general and of the factors hindering control strategies such as vaccination, by providing evidence for better adherence by healthcare personnel in Burkina Faso. Indeed, their results could guide decision-makers and policy-makers in the choice and orientation of future actions against emerging and re-emerging epidemics.

### CONFLICT OF INTERESTS

The author has declared any conflict of interests.

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### REFERENCES

- Betsch C, Schmid P, Heinemeier D, Korn L, Holtmann C, Böhm R (2018). Beyond confidence: Development of a measure assessing the 5C psychological antecedents of vaccination. *PLOS One* 13(12).
- Biswas N, Mustapha T, Khubchandani J, Price JH (2021). The nature and extent of COVID-19 vaccination hesitancy in healthcare workers. *Journal of community health* 46:1244-1251.
- Fall AS, Soufianou M, Cissé R, Cissé NS, Fall O, Lèye I (2021). L'acceptabilité des vaccins contre la COVID-19 au sein des communautés au Sénégal.
- Kouassi DP, Irika O, Soumahoro SI, Coulibaly M, Yao GHA, Kouame AD, Yeo S, Ouaga JM (2022). Acceptabilité de la vaccination contre la COVID-19 chez les professionnels de santé en Côte d'Ivoire, 2021. *Santé Publique* 34(4):549-556. <https://doi.org/10.3917/spub.224.0549>
- Lecroart A, D'Hoore W, Carrillo-Santistevé P (2021). L'hésitation vaccinale des professionnels de la santé contre le covid-19. *Education Santé* 13 p.
- Lucia VC, Kelekar A, Afonso NM (2021). COVID-19 vaccine hesitancy

- among medical students. *Journal of public health*, 43(3):445-449.
- MacDonald N, SAGE (2015). Vaccine hesitancy: Definition, scope and determinants. *Vaccine* 33(34):4161-4164.
- Machingaidze S, Wiysonge C (2021). Understanding COVID-19 vaccine hesitancy. *Nature Medicine*, 27(8):1338-1339.
- Rey L, Dare M (2020). La gestion de la pandémie du coronavirus en contexte africain : Quels enjeux? A+, le carrefour des acteurs publics, 7(1):2.
- Salam O, Wm OE, Nongoba S, Abdoulaye S, Hamadé O, Zabsonre P (2022). Vaccination coverage and reasons for acceptance or hesitation in vaccination against COVID-19 in patients with cardiovascular disease in Ouahigouya. *Health Sciences and Disease* 23(11).
- Shaw J, Stewart T, Anderson KB, Hanley S, Thomas SJ, Salmon DA, Morley C (2021). Assessment of US healthcare personnel attitudes towards coronavirus disease 2019 (COVID-19) vaccination in a large university healthcare system. *Clinical Infectious Diseases*, 73(10):1776-1783.
- Snène H, Zargouni A, Fendri M, Blibech H, Jebali A, Debbiche S, Belkhir D, Mehiri N, Ben SN, Louzir B (2022). Taux de vaccination contre la COVID-19 chez le personnel de santé dans un Centre hospitalo-universitaire à Tunis (Tunisie). *Revue des Maladies Respiratoires Actualités* 14(1):111-112.
- Sogodogo A (2022). Facteurs associés à la non vaccination contre la COVID-19 chez les étudiants de la Faculté de Médecine et d'Odontostomatologie (FMOS).  
<https://www.bibliosante.ml/handle/123456789/5636>
- World Health Organization (WHO) (2020). WHO provides a guiding light for Burkina Faso's COVID-19 pandemic response. <https://www.who.int/fr/news-room/feature-stories/detail/who-provides-a-guiding-light-for-burkina-faso-s-covid-19-pandemic-response>
- Yameogo WNZ, Kangoye D, Ouedraogo I, Dahourou D, Bamogo Y, Ouedraogo B, Diallo I, Sere L, Bassole A, Kabore F, Sanou A (2022). Fight Against Covid-19 in Burkina Faso, Between Fear of the Disease and Reluctance to Vaccinate: Case of the University Hospital of Tengandogo. *International Journal on Infectious Disease and Epidemiology* 3(2):1-5.