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Health-related quality of life among individuals vaccinated against COVID-19 in the Republic of the Congo in 2024

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Abstract

Introduction

Vaccination is regarded as the most effective strategy for curbing the spread of the virus. Despite the known benefits of vaccines, research has indicated a link between their use and the occurrence of serious side effects. The aim of this study was to assess health-related quality of life and associated factors among individuals vaccinated against COVID-19.

Methods

A cross-sectional study was conducted among people vaccinated against COVID-19. Data were collected by telephone, and linear regressions were used to identify factors associated with quality of life. All the analyses were performed via R software.

Results

The study included 222 vaccinated individuals, with a median age of 44 years (Q1 = 33 years, Q3 = 53 years). Among them, 30.2% reported postvaccination side effects, 65.8% were men, and 15.3% had chronic illnesses, 35.3% of which were discovered after vaccination. The lowest scores were observed for the dimensions of general health (76.64 ± 16.97), role physical (84.68 ± 28.85), vitality (54.57 ± 12.99) and mental health (73.15 ± 10.29). The mental component summary (MCS) score (48.08 ± 4.45) was lower than the physical component summary (PCS) score (54.24 ± 7.63). Factors associated with lower quality of life included older age, chronic diseases, secondary education level and post-vaccination side effects, whereas receipt of the Sputnik Light vaccine was associated with higher MCS scores.

Conclusion

COVID-19 vaccination may be associated, in some individuals, with transient and moderate perceived changes in quality of life, affecting mainly the mental component summary. These findings highlight the importance of a global health approach, including psychological well-being, as well as the need for appropriate follow-up and targeted communication for vulnerable groups.

Introduction

The emergence of the novel strain of the coronavirus SARS-CoV-2 has resulted in a global pandemic that has had a significant impact on all aspects of life. Following its emergence in Wuhan, China, the World Health Organisation (WHO) declared it a pandemic on 11 March 2020. As of 12 March 2025, the WHO recorded 777,454,911 cases and 7,088,612 deaths, representing a case fatality rate of 0.9%. Developed countries have experienced significantly higher levels of morbidity and mortality, whereas in developing

countries, the situation has been partially obscured by limited testing capacity. To date, 61% of cases and 75% of deaths have been recorded in Europe and the Americas, whereas in Africa, only 1% of cases and 2% of deaths have been reported [1].

In response to this global health emergency, unprecedented collaborative efforts between pharmaceutical companies, as well as considerable financial investment, have been made to accelerate the development and evaluation of vaccine candidates. Consequently, a number of vaccines have been developed by companies such as Pfizer, Johnson & Johnson, Sinopharm, Sputnik V and Sputnik Light [2]. Vaccination is a mass prevention strategy that immunises individuals against the infectious agents responsible for diseases. Vaccines offer numerous advantages in the fight against epidemics, providing medium- or long-term protection at an acceptable cost to society, depending on the duration of immune memory induced by the vaccine [2].

In light of this, a number of vaccines have been assessed for their effectiveness. The results of clinical trials indicate that the vaccines developed to combat SARS-CoV-2 are highly effective in preventing hospitalisation, severe illness and death. According to the EPI-PHARE study, all the vaccines studied showed high efficacy, notably the Pfizer, Moderna and AstraZeneca vaccines, which reduced the risk of hospitalisation by 92% (Pfizer), 96% (Moderna) and 96% (AstraZeneca) from the 14th day after the second dose. The risk of death during hospitalisation was comparable for both the Pfizer and Moderna vaccines [3, 4].

While vaccines are highly effective in preventing hospitalisation, severe cases and deaths, certain studies have highlighted potential adverse effects associated with specific vaccines. The aforementioned conditions include myocarditis, stroke, pericarditis, autoimmune hepatitis, thrombosis and thrombocytopenia [5–19].

To assess the effects of these vaccines, a number of studies have been carried out to evaluate the quality of life of those who have been vaccinated. In Nigeria, Ogar et al. reported a decline in the quality of life of those who were vaccinated [17]. A study conducted in Korea by Yoon et al. revealed that individuals who were vaccinated and subsequently developed myocarditis or pericarditis may experience difficulties at both the physical and psychological levels [20]. The principal factors associated with quality of life include lower educational attainment, advanced age, chronic illnesses, side effects, socioeconomic status, marital status, sex and smoking [17, 20–22]. Previous studies have not analysed the specific association between of each type of vaccine and quality of life among vaccinated individuals.

In the Congo, the rollout of the vaccine began in March 2021, and as of 25 July 2022, the percentage of vaccination coverage was 11.3% [23]. There is a paucity of studies on the effects of vaccines. The available data indicate that 56 out of every 10,000 people vaccinated experienced side effects [24], and 71.2% of people had antibodies against SARS-CoV-2 [25]. The side effects were generally mild and included muscle pain, headaches and fever. However, there are some rare but serious side effects, such as erectile dysfunction, coma and death [24, 26]. While vaccines are widely recognised as effective

means of prevention, no studies have yet been conducted on the quality of life of people vaccinated against COVID-19 following vaccination in the Congo. The present study aimed to assess the association between coronavirus disease 2019 (COVID-19) vaccination and quality of life among Congolese adults. The objective of this study was to address the following research question: To what extent is COVID-19 vaccination associated with the physical and mental components of health-related quality of life among vaccinated individuals? To answer this question, the following hypothesis has been formulated: COVID-19 vaccination is associated with variations in the quality of life of vaccinated individuals in the Republic of the Congo. These variations may be related to perceived postvaccination side effects, societal mistrust of vaccines, and psychological distress. The findings of this study help address a gap in the literature regarding the association between COVID-19 vaccination and quality of life in the Congo. They will also guide decision-makers in developing communication and awareness-raising strategies to promote vaccination and potentially lead to a review of the vaccination strategies currently in place.

Population and methods

1. Design and period of study

An analytical cross-sectional study was conducted from 16 September to 9 October 2024 in Brazzaville. This study focused primarily on the quality of life of vaccinated individuals. The decision to conduct a cross-sectional study is substantiated by the fact that it provides an immediate overview of the quality of life experienced by vaccinated individuals. Its key advantages are that it is less costly and quicker to implement, as data are collected in a single round. This design is suitable for an initial exploration of the quality of life of people vaccinated against COVID-19 in the context of the Congo, where this issue has not yet been explored. However, as quality of life is a dynamic variable, a longitudinal study would have enabled tracking of changes in quality of life over time following vaccination. This would have enabled the establishment of temporal relationships and identification of individual trajectory profiles [27, 28]. Consequently, the cross-sectional approach provides a solid foundation for generating hypotheses that can be investigated in greater depth at a later stage through longitudinal studies.

2. Study population

The study population consisted of people who received the COVID-19 vaccine between 25 March and 31 December 2021 in Brazzaville, Republic of the Congo.

3. Sampling frame

The database of people vaccinated against COVID-19, sourced from the Integrated COVID-19 Response System (SIRCOV), was used as the sampling frame. This database is hosted by the National Regulatory Agency for Posts and Electronic Communications (ARPCE). For the period from March to December 2021, we extracted a subdataset of 247,758 people vaccinated in Brazzaville from the SIRCOV.

4. Sample size

The sample size was estimated via R software with the « samplingbook » package and the command $samp \leq .size.mean(e, S, N = Inf, \leq vel = 0.95)$, where « e » represents the precision, « S » the standard deviation of the general health dimension from a study in the canton of Vaud [29], « N » the size of the source population, and « level » the confidence level. General Health was selected because no previous data on PCS or MCS were available in the Congolese context. The R script utilised was as follows: sample.size.mean(3, 19.85, N = 247758, level = 0.95). Consequently, the minimum sample size was 169 vaccinated individuals.

5. Sampling method

Five strata, on the basis of the type of vaccine received, were established. Simple random sampling was performed within each stratum, and the number of people to be included in each stratum depended on its weight. If a selected person did not meet the inclusion criteria, they were replaced by the next person on the list.

6. Selection criteria

Participants meeting the following criteria were included in the study: 1) had been vaccinated against COVID-19 between March and December 2021 in Brazzaville; 2) had a valid telephone number; and 3) agreed to take part in the study. Individuals whose telephone numbers were unavailable and those who withdrew their informed consent during the interviews were not included.

7. Data collection tools and methods

A pretested questionnaire was used to collect sociodemographic and clinical data. The standardised SF-36 form was used to assess quality of life [30]. The SF-36 questionnaire is a multidimensional, generic scale that assesses health status independently of the underlying condition, sex, age and treatment. It comprises eight dimensions: 1) physical functioning, 2) role physical, 3) bodily pain, 4) general health, 5) vitality, 6) social functioning, 7) role emotional, and 8) mental health [30]. Each item is weighted via an additive scale to calculate the final score for the domain. The composite scores for the physical component summary (PCS) and mental component summary (MCS) summarise the dimensions of physical and mental health, respectively.

The data were entered into Kobo Collect and stored in Kobotoolbox. Telephone interviews were conducted to collect the data. To control for biases common in telephone surveys, several measures were employed. For example, to control for selection bias, telephone numbers that did not answer the first call were dialled several times throughout the day before being excluded. To minimise recall bias related to vaccination data, information on vaccination was extracted from the national vaccination database. With respect to side effects, a list of the most common side effects was presented to the respondents to aid their recall and improve the reliability of their responses. The telephone interviews were conducted by qualified interviewers who had received prior training in the data collection

procedure. This training aimed to standardise the administration of the questionnaire among the four interviewers involved. The entire process was supervised by the principal investigator to ensure the quality and consistency of the data collected.

8. Statistical analysis

Qualitative variables are presented in the form of tables and graphs. For quantitative variables, means, standard deviations, medians and quartiles were calculated. Means were compared via Student's t test and ANOVA, as appropriate.

The PCS and MCS scores were calculated according to the algorithm set out in the SF-36 questionnaire user manual by weighting each dimension according to its component [30]. Scores range from 0 to 100, with higher scores indicating better perceived health status and quality of life.

To investigate the factors associated with quality of life, linear regression was used. We measured the strength of the association between quality of life (Y) for each component and each of the explanatory variables (X).

The final model enabled us to estimate the beta (β) regression coefficients. The β coefficients were estimated and interpreted: if $\beta > 0$, there is a positive association between X and Y (higher values of X are associated with higher values of Y), and if $\beta < 0$, there is a negative association between X and Y (higher values of X are associated with lower values of Y). The quality of the regression model, as measured by R^2, and the marginal contribution of the explanatory variables were assessed. The data were analysed via R software version 4.4.2. The significance level for the statistical tests was set at 5%.

Results

Sociodemographic characteristics of the participants

The main sociodemographic and clinical characteristics of the participants are presented in the table below (Table 1). Among the 222 vaccinated individuals, the median age was 44 years (Q1: 33 years; Q3: 53 years). A total of 68.4% were under 50 years of age, 77.0% had completed secondary education, and 78.4% were living with a partner.

Table 1
Sociodemographic characteristics of vaccinated respondents (N = 222)

Variables	Number	Percentage
Gender		
Male	146	65.8
Female	76	34.2
Age groups (Years)		
≤ 29	36	16.2
30–39	48	21.6
40–49	68	30.6
50–59	39	17.6
60–69	27	12.2
≥ 70	4	1.8
Marital status		
In a relationship	174	78.4
Single	48	21.6
Level of education		
None	2	0.9
Primary	4	1.8
Secondary	171	77.0
Higher	45	20.3

The vaccination characteristics of the participants are presented in the table below (Table 2). In terms of the type of vaccine, 48.6% had received the Johnson & Johnson vaccine, and 30.2% reported experiencing at least one side effect following vaccination. Among these individuals, 15.3% had at least one chronic disease, 35.3% of whom were diagnosed after vaccination. Furthermore, 12.6% of the participants had high blood pressure, and 4.5% had diabetes.

Table 2
Clinical and vaccination characteristics of vaccinated individuals (N = 222)

Variables	Number	Percentage
Type of vaccine		
Johnson & Johnson	108	48.6
Sinopharm	88	39.6
Sputnik light	22	9.9
Sputnik V	4	1.8
Side effects	67	30.2
Chronic Diseases	34	15.3
Diagnosis of chronic diseases		
After vaccination	12	35.3
Before vaccination	22	64.7
Types of chronic diseases		
High blood pressure	28	12.6
Diabetes	10	4.5
Stroke	1	0.5
History of COVID-19 infection	8	3.6

Side effects of COVID-19 vaccines

The most common side effects reported by the participants were fever (34.3%), dizziness (34.3%), headache (23.9%) and fatigue (17.9%) (Fig. 1). The participants also reported menstrual disorders (4.5%), sexual dysfunction (3.0%) and self-reported fertility problems (1.5%). These side effects can cause significant concern among those who have been vaccinated and may affect their quality of life.

Assessment of quality of life among vaccinated individuals

Table 3 shows the mean scores for the eight dimensions of quality of life. Among the physical health domains, general health had the lowest score (76.64 ± 16.97), whereas among the mental health domains, vitality had the lowest score (54.57 ± 12.99), followed by mental health (73.15 ± 10.08). The minimum values for these three dimensions were also low: 15 for general health, 30 for vitality and 40 for mental health. These same dimensions also have the lowest median values, namely, 55 for vitality, 76

for mental health and 80 for general health. Overall, the MCS score (48.08 ± 4.45) was lower than the PCS score (54.24 ± 7.63).

Table 3
SF-36 domain scores and summary component scores among vaccinated individuals

Variables	Mean	SD	Min–Max	Q1	Q2	Q3
Physical Component Summary (PCS)	54.24	7.63	24.15–62.64	52.5	57.36	59.09
Physical Functioning	93.72	10.65	20–100	90	100	100
General Health	76.64	16.97	15–100	65	80	90
Role Physical	84.68	28.87	0-100	75	100	100
Bodily Pain	89.86	17.08	10–100	78	100	100
Mental Component Summary (MCS)	48.08	4.45	33.01–60.34	46.8	49.08	51.13
Role Emotional	95.50	17.87	0-100	100	100	100
Vitality	54.57	12.99	30–95	45	55	65
Mental Health	73.15	10.08	40–100	68	76	80
Social Functioning	88.53	17.03	25–100	88	100	100

Factors associated with the quality of life of people vaccinated against COVID-19 in relation to the physical component summary (PCS) of the SF-36

Table 4 presents the results of the multivariate analysis of factors associated with the physical component summary (PCS). The multicollinearity analysis shows variance inflation factors (VIFs) less than 4, indicating an absence of multicollinearity between the variables in the model.

With respect to the analysis of factors associated with the physical component, age ($\beta = -0.13$, $p < 0.001$), the presence of a chronic condition ($\beta = -2.86$, $p = 0.041$) and the occurrence of side effects following vaccination ($\beta = -2.81$, $p = 0.010$) were associated with a reduction in the quality of life score. Therefore, older vaccinated individuals who experienced postvaccination side effects tended to report lower PCS scores. Among the three factors identified, age has a more pronounced influence on quality of life, with a weight (importance value, IV) of 3.2%, than do chronic diseases and side effects, which each have a value of 2.44%. This suggests that age is the most decisive factor in the physical component.

The final regression equation was as follows: Y = 61.12–0.13*Age–2.86*Chronic diseases–2.81*Side effects.

Table 4
Analysis of factors associated with the physical component (PCS) of quality of life: initial and final linear regression models

Variables	PCS (Initial model)		VIF	VI	PCS (final model)	
	β(SE)	p			β(SE)	p
Age (Years)	-0.14 (0.04)	< 0.001*	1.09	3.42	-0.13 (0.04)	< 0.001*
Gender (Ref : Male)			1.06			
Female	1.60 (1.07)	0.136		1.22		
Level of education (Ref : Higher)			1.04			
None	1.06 (5.34)	0.842		0.20		
Primary	4.18 (4.06)	0.305		1.03		
Secondary	-2.09 (1.23)	0.094		1.68		
Marital status (Ref : Single)			1.16			
In a relationship	0.51 (1.37)	0.712		0.37		
Chronic Diseases (Ref : No)			1.07			
Yes	-3.53 (1.44)	0.015*		2.44	-2.86 (1.39)	0.041*
Type of vaccine (Ref : Johnson & Johnson)			1.06			
Sinopharm	0.49 (1.08)	0.651		0.45		
Sputnik light	0.54 (1.86)	0.774		0.29		
Sputnik V	4.67 (3.79)	0.219		1.23		
Side effects (Ref : No)			1.05			
Yes	-2.67 (1.10)	0.016*		2.44	-2.81 (1.09)	0.010*
History of COVID-19 infection (Ref : No)			1.04			
Yes	-1.05 (2.70)	0.696		0.39		
Constant	61.98 (2.06)	< 0.001*			61.12 (1.70)	< 0.001*
F-value		0.000				0.000
R^2	0.153				0.117	
Adjusted R^2	0.104				0.104	

*p < 0,05: Statistically significant association, VI: Importance of the variable; VIF: Variance inflation factor

Factors associated with the quality of life of people vaccinated against COVID-19 in relation to the mental health component of the SF-36

Table 5 presents the results of the multivariate analysis of factors associated with the mental health component (MCS). The multicollinearity analysis shows variance inflation factors (VIFs) less than 4, indicating an absence of multicollinearity between the variables in the model. Secondary education (β = -2.80, $p < 0.001$) and the presence of chronic diseases (β = -2.09, $p = 0.010$) were associated with a lower MCS score, whereas receiving the Sputnik Light vaccine (β = 2.72, $p = 0.009$) was associated with an improvement. In terms of significance, educational attainment appears to be the most influential factor on the mental component of quality of life, with a weight of 3.54%, followed by the type of vaccine, notably Sputnik Light (2.76%), and then the presence of chronic diseases (2.59%). These results suggest that educational attainment plays an important role in shaping postvaccination perceptions and experiences.

The algebraic equation for this model is as follows: Y = 50.84–2.80 * Secondary education level – 1.52 * Primary education level + 2.29 * No formal education + 2.72 * Sputnik Light vaccine + 0.23 * Sinopharm vaccine + 1.50 * Sputnik V vaccine – 2.09 * Chronic diseases.

Table 5
Analysis of factors associated with the mental component (MCS) of quality of life: initial and final linear regression models

Variables	MCS (Initial model)		VIF	VI	MCS (Final model)	
	β(SE)	p			β(SE)	p
Age (Years)	0.03 (0.02)	0.181	1.09			
Gender (Ref : Male)			1.06			
Female	0.85 (0.62)	0.176				
Level of education (Ref : Higher)			1.04			
None	2.69 (3.08)	0.382		0.86	2.29 (3.07)	0.456
Primary	-2.90 (2.34)	0.216		1.24	-1.52 (2.29)	0.507
Secondary	-2.52 (0.71)	0.000*		3.54	-2.80 (0.70)	< 0.001*
Marital status (Ref : Single)			1.16			
In a relationship	-1.35 (0.79)	0.089				
Chronic Diseases (Ref : No)			1.07			
Yes	-2.22 (0.83)	0.008*		2.59	-2.09 (0.80)	0.010*
Type of vaccine (Ref : Johnson & Johnson)			1.06			
Sinopharm	0.52 (0.62)	0.403		0.84	0.23 (0.606)	0.710
Sputnik light	2.96 (1.07)	0.006*		2.76	2.72 (1.03)	0.009*
Sputnik V	1.42 (2.18)	0.516		0.65	1.50 (2.19)	0.494
Side effects (Ref : No)			1.05			
Yes	-0.23 (0.64)	0.723		0.36		
History of COVID-19 infection (Ref : No)			1.04			
Yes	1.59 (1.56)	0.306		1.03		
Constant	49.86 (1.19)	< 0.001*			50.84 (0.71)	< 0.001*
F-value		0.000				0.000
R^2	0.172				0.143	
Adjusted R^2	0.125				0.114	

*p < 0,05: Statistically significant association; β: regression coefficient; SE: standard error

The two linear regression models enabled us to propose the conceptual framework set out below (Fig. 2).

Discussion

The aim of this study was to assess the quality of life of people vaccinated against COVID-19 on the basis of a sample of 222 individuals. This is the first study of its kind in the Republic of the Congo, thereby providing evidence-based data on the perceived effects of vaccination in an African context, where there is still little research on this topic.

Our results revealed that, of the eight (8) dimensions of quality of life assessed, general health, vitality and mental health had the lowest scores. With respect to the composite quality of life scores, the mental component summary (MCS) score was lower than the physical component summary (PCS) score, suggesting a comparatively poorer mental health-related quality of life. Our results corroborate those of Lin et al., who reported lower scores among individuals vaccinated against COVID-19 in a study conducted in Taiwan; however, this association was not statistically significant [31]. The significant reduction in the mental component of quality of life (MCS) score could be attributed to stress [32] as well as to the quality of information circulating on social media regarding the long-term effects of vaccines [33–35].

To better understand these results, an in-depth analysis was carried out to identify the factors that might affect the quality of life of vaccinated individuals after adjustment.

The first factor identified was age. Indeed, we observed that as age increased, the score for the physical component of quality of life among vaccinated individuals decreased. Our results corroborate those of Lin et al., who demonstrated an association between age and lower PCS scores [31]. This decline could be explained by the natural ageing process, which creates conditions conducive to the development of chronic diseases whose effects tend to worsen with age.

The second factor associated with the quality of life of vaccinated individuals is the presence of at least one chronic disease. Indeed, the presence of chronic diseases was associated with lower PCS and MCS scores. These findings are consistent with those reported by Lin et al., who reported that vaccinated individuals with chronic diseases had a reduced quality of life [31]. The association between chronic diseases and quality of life in general was highlighted in a study conducted in Lebanon by El Osta et al. [36]. This reduction could be linked to the chronic nature of the disease, the number of diseases and the use of medication, all of which can affect daily life and be a source of psychosocial problems.

The third factor associated with quality of life was the occurrence of at least one side effect following vaccination. Previous studies support our findings [17, 20, 37]. These findings may be explained by the

observation that adverse effects can impair people's quality of life, as they may lead to or prolong hospitalisation or even result in death [24, 38].

With respect to the association between vaccine type and the quality of life of those vaccinated, those who received the Sputnik Light vaccine had a better quality of life in terms of mental health (MCS) than did those vaccinated with the Johnson & Johnson vaccine. For the other vaccines, notably Sinopharm and Sputnik V, no significant difference was observed. One possible explanation is that Sputnik Light recipients may have experienced fewer side effects, as reported in a previous Congolese study [24]. This finding should be interpreted with caution because of the relatively small number of participants vaccinated with Sputnik Light.

Finally, educational attainment was identified as a factor associated with quality of life in the mental component (MCS). Those with secondary education had lower mental quality of life scores than those with higher education. These findings corroborate those of Alam et al. in the USA, who reported that vaccinated teachers with lower levels of education were more likely to suffer from depression and anxiety than others were [21]. This difference could be linked to exposure to disinformation, particularly online, as demonstrated by a Vietnamese study in which disinformation had negative effects on mental health, particularly through stress [35]. Individuals with higher educational attainment are more likely to verify information and protect themselves against misinformation, unlike those with only secondary education. This highlights the importance of quality education for managing health, particularly in the context of health crises such as the COVID-19 pandemic.

These factors have led to the development of two conceptual models explaining quality of life. The first model, which focuses on the physical component (PCS) of quality of life, highlights the association of age, chronic conditions and postvaccination side effects. The second model, which addresses the mental component (MCS) of quality of life, incorporates educational attainment, chronic diseases and the type of vaccine, particularly the Sputnik Light vaccine. These models suggest that any strategy aimed at improving the quality of life of people vaccinated against COVID-19 should target these factors. These findings are consistent with Engel's biopsychosocial model (1977), according to which health status results from the interaction between three major components: biological (age, chronic conditions, vaccines, medical treatments, etc.), social (level of education, employment, social support, etc.) and psychological (perceptions, mental health, stress, etc.) [39, 40].

The findings of this study have several implications for public health policy, vaccination campaigns and the management of vaccine side effects. First, this information can be used to develop specific support strategies, particularly for vulnerable groups (older people, people with chronic conditions, and people with lower levels of education). Second, the research emphasises the necessity for more comprehensive postvaccination monitoring and clear communication, tailored to educational levels, regarding possible side effects to reduce anxiety and uncertainty among those who have been vaccinated. Third, the findings emphasise the necessity of incorporating mental health into public health strategies. This may

include the provision of postvaccination psychological support strategies, the aim of which is to mitigate any potential negative changes in quality of life.

This study has limitations that should be taken into account when the results are interpreted. First, the cross-sectional nature of the study does not allow conclusions to be drawn regarding cause and effect relationships between vaccination and quality of life. Second, although the study sample was randomly selected, there is a possibility of selection bias, particularly due to the exclusive inclusion of individuals who had a valid telephone number and consented to participate in the study. This criterion could exclude certain demographic groups, such as those with limited access to technology or those residing in less connected areas, which may result in an underestimation or overestimation of the quality of life scores obtained in this study. Third, the geographical representativeness of the sample is limited to the city of Brazzaville. Therefore, it is not possible to extrapolate the results to the Congolese population or to other departments in the country due to socioeconomic, health and cultural disparities between departments. The fourth limitation relates to recall bias, in that the reported side effects may be underestimated or overestimated. The fifth limitation relates to the explanatory variables in the two regression models, which account for only 10.4% and 11.4% of the variance in quality of life scores. This suggests that other potentially influential factors (socioeconomic status, stress, anxiety, depression, exposure to misinformation, etc.) were not included in the analysis. It is clear that further research is needed to enhance our comprehension of the relationship between vaccination and quality of life in a range of different contexts.

Conclusion

COVID-19 vaccination may, in some people, be associated with transient changes in perceived quality of life, affecting both physical and mental aspects. When such changes are observed, they affect mainly mental health and generally remain moderate. These findings highlight the importance of a holistic health approach in public health strategies, integrating psychological well-being. They also underscore the need for appropriate follow-up to assess postvaccination quality of life changes and for strengthened communication about vaccination, particularly for vulnerable groups.

Abbreviations

ANOVA	**:**	**Analysis of Variance**
ARPCE	:	National Agency for Regulation of Posts and Electronic Communications
CERSSA	:	Research Ethics Committee in Health Sciences
COVID-19	:	Coronavirus Disease 2019
MCS	:	Mental Component Summary
Min-Max	:	Minimum and Maximum
P	:	p-value
PCS	:	Physical Component Summary
Q1, Q2, Q3	:	First quartile, median (second quartile), third quartile
R^2	:	Coefficient of determination
SARS-CoV-2	:	Severe Acute Respiratory Syndrome Coronavirus 2
SD	:	Standard Deviation
SE	:	Standard Error
SF-36	:	Short Form 36
SIRCOV	:	Integrated COVID-19 Response System
VI	:	Variable Importance
VIF	:	Variance Inflation Factor
WHO	:	World Health Organisation
β (beta)	:	Linear regression coefficient

Declarations

Ethics approval and consent to participate

The protocol for this study was reviewed and approved by the Health Sciences Research Ethics Committee (Comité d'éthique et de recherche en sciences de la santé, CERSSA) (N° :137 – 24/MERSIT/DGRST/CERSSA/-24), under the Ministry of High Education, Scientific Research and Technological Innovation of the Republic of the Congo. Administrative authorisation to access the national COVID-19 vaccination database was granted by the Ministry of Health and Population of the Republic of the Congo. This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. All participants were informed of the objectives, the voluntary nature of their participation, the confidentiality of the information collected, and their right to withdraw at any time

without consequence. Verbal informed consent was obtained from all participants prior to data collection because interviews were conducted by telephone.

Clinical trial number

Not Applicable

Consent for publication

Not Applicable

Conflict of interest

The authors declare that they have no competing interests.

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Author Contribution

JMP was responsible for drafting the protocol, collecting and analysing the data, and writing the manuscript. The supervision and validation of the various stages were carried out by GN and GEEM, while the editing of the manuscript was undertaken by RFN, JRNA and ACN. All the authors made valuable contributions to this study.

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Data Availability

The raw datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

References

1. Organisation mondiale de la Santé. Coronavirus Disease (COVID-19) Situation Reports [Internet]. World Health Organization. 2025 [cité 9 juin 2025]. Disponible sur: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports
2. Feraoun Y, Maisonnasse P, Grand RL, Beignon AS. COVID-19, des vaccins à la vitesse de l'éclair. Med Sci (Paris) 1 août. 2021;37(8–9):759–72.
3. Semenzato L, Botton J, Baricault B, Deloumeaux J, Joachim C, Sylvestre E et al. nov. Estimation de l'impact de la vaccination sur le risque de formes graves de COVID-19 au sein des départements d'Outre-Mer à partir des données du Système national des données de santé (SNDS) - Résultats jusqu'au 30 septembre 2021. Revue d'Épidémiologie et de Santé Publique. 1 2022;70(4):S257–8.
4. Bouillon K, Baricault B, Botton J, Jabagi MJ, Bertrand M, Semenzato L et al. oct. Estimation de l'impact de la vaccination chez les personnes âgées de 75 ans et plus sur le risque de formes graves de Covid-19 en France à partir des données du Système National des Données de Santé (SNDS) – actualisation jusqu'au 20 juillet 202. . 11 2021;1–33.
5. Abu Mouch S, Roguin A, Hellou E, Ishai A, Shoshan U, Mahamid L, et al. Myocarditis following COVID-19 mRNA vaccination. Vaccine 29 juin. 2021;39(29):3790–3.
6. Al Shahrani A, Alhumaidan N, Alzelfawi L, AlDosari L, Alhindawi Z, Alotaibi N, et al. Prevalence of menstrual alterations following COVID-19 vaccination: systematic review & meta-analysis. BMC Women's Health 19 sept. 2024;24(1):523.
7. Botton J, Jabagi MJ, Bertrand M, Baricault B, Drouin J, Vu SL et al. Évaluation du risque d'infarctus du myocarde, d'accident vasculaire cérébral et d'embolie pulmonaire suite aux différents vaccins anti- COVID-19 chez les adultes de moins de 75 ans en France. www.epi-phare.fr. 18 janv 2022;1–14.
8. Bril F, Al Diffalha S, Dean M, Fettig DM. Autoimmune hepatitis developing after coronavirus disease 2019 (COVID-19) vaccine: Causality or casualty? J Hepatol juill. 2021;75(1):222–4.
9. Choe YJ, Ahn YH, Gwak E, Jo E, Kim J, Choe SA. Safety of BNT162b2 mRNA COVID-19 vaccine in children with chronic kidney disease: a national population study from South Korea. Pediatr Nephrol 1 févr. 2024;39(2):625–9.
10. Dionne A, Sperotto F, Chamberlain S, Baker AL, Powell AJ, Prakash A, et al. Association of Myocarditis With BNT162b2 Messenger RNA COVID-19 Vaccine in a Case Series of Children. JAMA Cardiol déc. 2021;6(12):1–6.
11. Fadi SI, Qashqari M, Dahlawi HM, Assaggaf R, Alsafi A, Gari A, Abudawood et al. Effect of the COVID-19 Vaccine on the Menstrual Cycle among Females in Saudi Arabia. Ethiop J Health Sci [Internet]. 1 nov 2022 [cité 13 déc 2024];32(6). Disponible sur: https://www.ajol.info/index.php/ejhs/article/view/237452
12. Fakhfakh E, Bouattour N, Sakka S, Moalla KS, Daoud S, Farhat N, et al. Complications neurologiques liées à la vaccination contre le SARS-CoV-2. Revue Neurologique 1 avr. 2022;178:S71–2.
13. Heymans S, Cooper LT. Myocarditis after COVID-19 mRNA vaccination: clinical observations and potential mechanisms. Nat Rev Cardiol févr. 2022;19(2):75–7.

14. Jain SS, Anderson SA, Steele JM, Wilson HC, Muniz JC, Soslow JH, et al. Cardiac manifestations and outcomes of COVID-19 vaccine-associated myocarditis in the young in the USA: longitudinal results from the Myocarditis After COVID Vaccination (MACiV) multicenter study. eClinicalMedicine oct. 2024;76:102809.
15. Le Vu S, Bertrand M, Jabagi MJ, Botton J, Drouin J, Baricault B, et al. Age and sex-specific risks of myocarditis and pericarditis following Covid-19 messenger RNA vaccines. Nat Commun 25 juin. 2022;13(1):3633.
16. Le Vu S, Bertrand M, Semenzato L, Jabagi MJ, Botton J, Drouin J, et al. Influence of mRNA Covid-19 vaccine dosing interval on the risk of myocarditis. Nat Commun 5 sept. 2024;15(1):7745.
17. Ogar CK, Gilbert HN, Bloem LT, Leopold C, Bassi PU, Katagum YM, et al. Patient-reported outcomes of adverse events after COVID-19 vaccination in Nigeria: A mixed methods study. Vaccine oct. 2024;42(23):126196.
18. Le Vu S, Bertrand M, Botton J, Jabagi MJ, Drouin J, Semenzato L et al. Risk of Guillain–Barré Syndrome Following COVID-19 Vaccines: A Nationwide Self-controlled Case Series Study. Neurology [Internet]. 3 oct 2023 [cité 8 nov 2023]; Disponible sur: https://n.neurology.org/content/early/2023/10/03/WNL.0000000000207847
19. Wu KY, Butler CR, Koshman S, Oudit GY, Paterson DI. Myopéricardite persistante après une vaccination hétérologue à ARNm anti-SRAS-CoV-2. CMAJ 24 juill. 2023;195(28):E965–8.
20. Yoon Y, Hwang MJ, Shin SH, Choi H, Na S, Park S et al. Health-related quality of life in adolescents with myocarditis and pericarditis after BNT162b2 COVID-19 vaccination: Korean national surveillance. Eur J Cardiovasc Nurs 14 mars 2025;zvaf033.
21. Alam MD, Islam A, Hossain MS, Hossain A, Akhter D, Haider MM, et al. Mental health outcomes and associated factors among vaccinated and unvaccinated teachers against COVID-19 infection in Bangladesh. Front Psychiatry 3 août. 2022;13:896419.
22. Chen S, Aruldass AR, Cardinal RN. Mental health outcomes after SARS-CoV-2 vaccination in the United States: A national cross-sectional study. J Affect Disorders 1 févr. 2022;298:396–9.
23. Ministère de la Santé et de la Population. Riposte à la COVID-19 au Congo [Internet]. République du Congo. 2022 juill p. 13. Report No.: SITREP N°244. Disponible sur: https://www.afro.who.int/fr/countries/congo/publication/riposte-lepidemie-de-covid-19-au-congo-rapports-de-situation
24. Voumbo Matoumona Mavoungou YVY, Niama AC, Ndziessi G, Pandzou G, Bono A, Ossou-Nguiet PM. Vaccination against COVID-19: Surveillance of Adverse Events in Brazzaville. Microbiol Infect Dis. 30 juin. 2022;6(2):1–6.
25. Ndziessi G, Niama RF, Aloumba AG, Peya JM, Ngatse JA, Ngoyomi RA, et al. Seroprevalence of SARS-CoV-2 antibodies in Republic of Congo, February 2022. Epidemiol Infect. sept 2023;11(e162):1–10.
26. Mavoungou YVY, Niama AC, Annette B, Ndziessi G, Pandzou G, Ossou-Nguiet PM. Factors Associated with Adverse Events Following COVID-19 Immunisation in Brazzaville. Open J Public

Health 5 déc. 2022;4(3):1–7.
27. Baghdadli A, Aussilloux C. Intérêts et limites des études longitudinales dans la mesure du changement chez la personne autiste. Enfance. 2002;54(1):40–50.
28. Caruana EJ, Roman M, Hernández-Sánchez J, Solli P. Longitudinal studies. J Thorac Dis nov. 2015;7(11):E537–40.
29. Richard JL, Kah Bouzourène S, Gallant P, Ricciardi P, Sudre Alfen et al. Validation et normes du SF-36 dans la population du canton de Vaud | Unisanté [Internet]. 2000 [cité 15 nov 2024]. Disponible sur: https://www.unisante.ch/fr/formation-recherche/recherche/publications/raisons-sante/raisons-sante-028
30. Ware JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care juin. 1992;30(6):473–83.
31. Lin CY, Fan CW, Ahorsu DK, Lin YC, Weng HC, Griffiths MD. Associations between vaccination and quality of life among Taiwan general population: A comparison between COVID-19 vaccines and flu vaccines. Hum Vaccines Immunotherapeutics. nov 2022;30(5):2079344.
32. Zhang XJ, Qin JJ, Cheng X, Shen L, Zhao YC, Yuan Y, et al. In-Hospital Use of Statins Is Associated with a Reduced Risk of Mortality among Individuals with COVID-19. Cell Metabolism 4 août. 2020;32(2):176–e1874.
33. Mărcău FC, Peptan C, Băleanu VD, Holt AG, Iana SA, Gheorman V. Analysis regarding the impact of « fake news » on the quality of life of the population in a region affected by earthquake activity. The case of Romania-Northern Oltenia. Front Public Health. 2023;11:1244564.
34. Moitra S, Anderson A, Eathorne A, Brickstock A, Adan A, Akgün M, et al. COVID-19 infodemic and health-related quality of life in patients with chronic respiratory diseases: A multicentre, observational study. J Glob Health 10 nov. 2023;13:06045.
35. Nguyen PTH, Van Huynh S, Nguyen NNY, Le TB, Le PC, Nantachai G, et al. The relationship between transmission misinformation, COVID-19 stress and satisfaction with life among adults. Front Psychol. 2022;13:1003629.
36. El Osta N, Kanso F, Saad R, Khabbaz LR, Fakhouri J, El Osta L. Validation du SF-36, questionnaire générique de la qualité de vie liée à la santé chez les personnes âgées au Liban. East Mediterr Health J 1. oct 2019;25(10):706–14.
37. Charles C, Sultan S, Bungener C, Mateus C, Lanoy É, Dauchy S, et al. Impact des toxicités cutanées associées aux thérapies ciblées sur la qualité de vie. Résultats d'une étude pilote longitudinale. Bull du Cancer 1 mars. 2013;100(3):213–22.
38. See I, Lale A, Marquez P, Streiff MB, Wheeler AP, Tepper NK, et al. Case Series of Thrombosis With Thrombocytopenia Syndrome After COVID-19 Vaccination-United States, December 2020 to August 2021. Ann Intern Med avr. 2022;175(4):513–22.
39. Bolton D, Tinland J, Giroux É, Ferry-Danini J. Le modèle biopsychosocial et le nouvel humanisme médical. Archives de Philosophie 26 oct 2020;Tome 83(4):13–40.

40. Papadimitriou GN. The « Biopsychosocial Model »: 40 years of application in Psychiatry. Psychiatriki 1 juill. 2017;28(2):107–10.

Figures

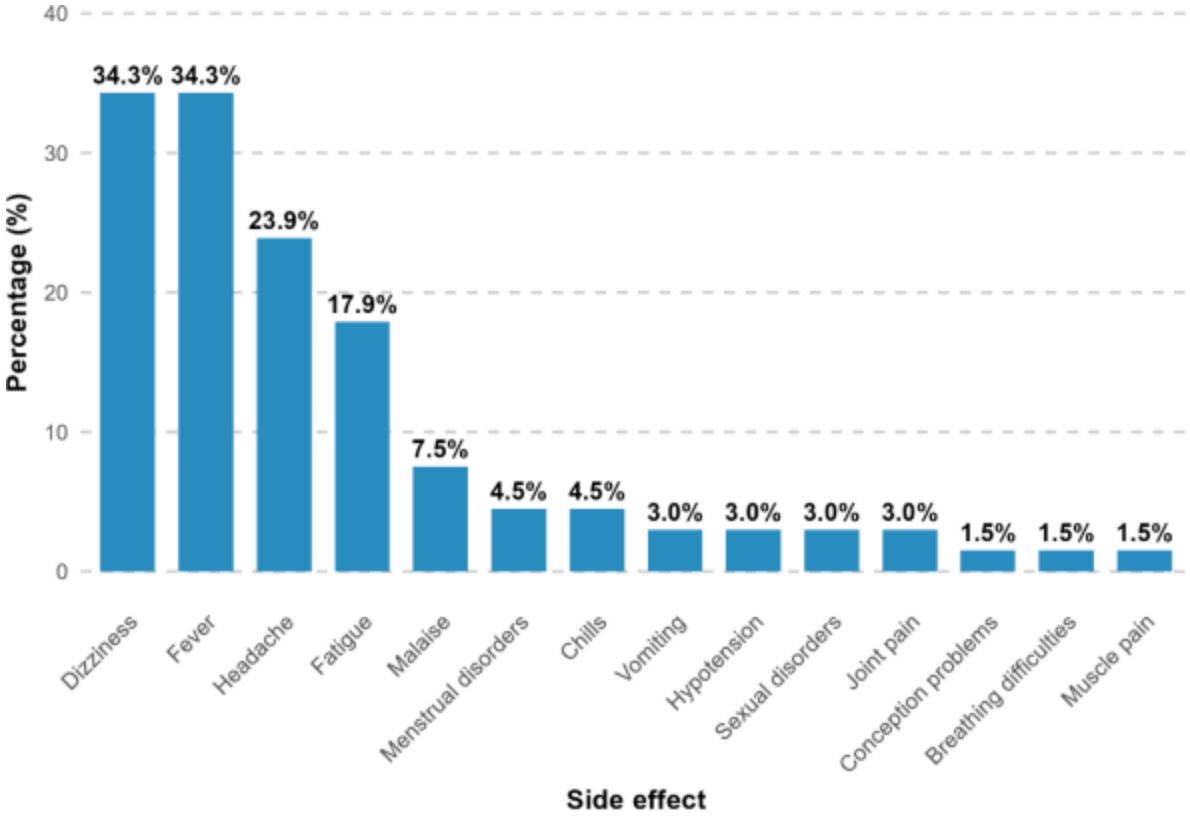


Figure 1

Side effects reported by those who have been vaccinated

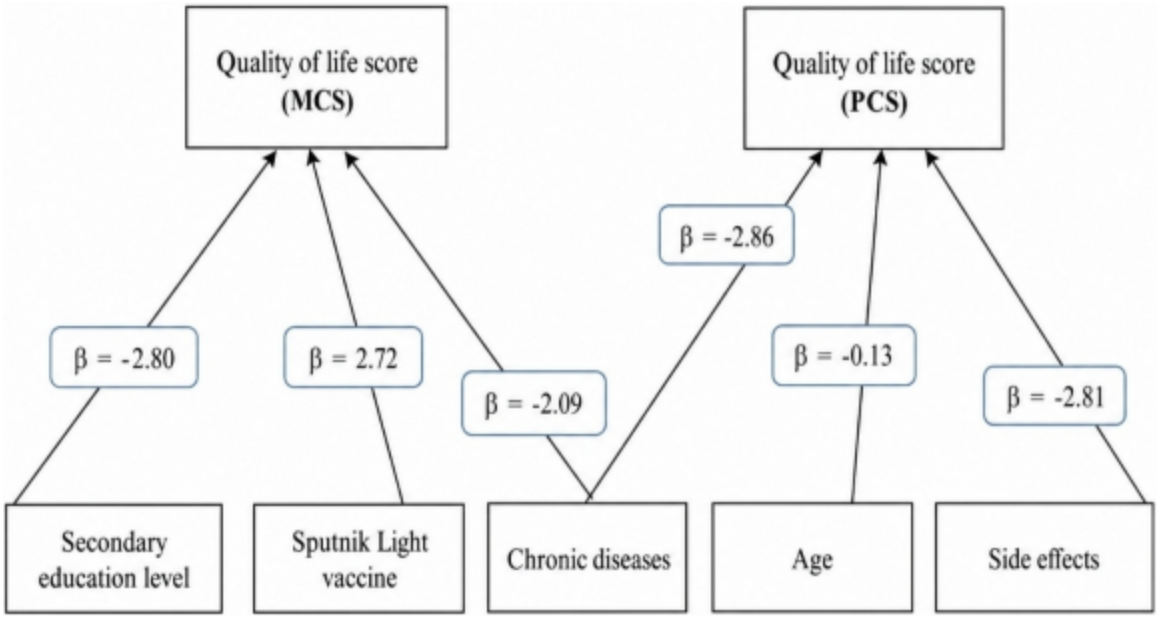


Figure 2

Conceptual framework derived from multivariable linear regression models.