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The Health-Related Quality of Life of Chronic Hepatitis B Virus Carriers Admitted to Yalgado OUEDRAOGO University Hospital, from January 31 to May 31, 2022, Burkina Faso

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Abstract

Introduction: According to the World Health Organization, chronic hepatitis B is the leading cause of mortality from liver disease and constitutes a public health problem. The aim of this study was to assess the quality of life of chronic hepatitis B virus carriers at the Yalgado OUEDRAOGO University hospital, and to identify the factors associated with this quality of life. **Methods:** We conducted a cross-sectional study at the Yalgado OUEDRAOGO University Hospital from January 31 to May 31, 2022, among chronic hepatitis B carriers aged at least 18 years who were followed for at least six months, treated or not. **Results:** The study included 135 patients, with an average age of 41.62 ± 10.69 years and a male predominance (64.44%). The average infection duration was 8.11 years ± 6, and the Chronic Liver Disease Questionnaire - Hepatitis B Virus (CLDQ-HBV) global quality of life score was 5.95 ± 0.90. Respondents' overall quality of life was linked with gender, history of depression, and history of fatigue (ORa = 0.42 (p = 0.009), ORa = 1.57 (p < 0.001), and ORa = 1.19 (p < 0.001). In the "fatigue" factor, men had a 1.45-fold higher quality of life than women (p = 0.041). Patients without a history of depression had higher quality of life in "emotion" (ORa = 1.42; p < 0.001), "fatigue" (ORa = 1.67; p = 0.035), and "sleep" (ORa = 1.63; p < 0.0001). Finally, our study indicated that quality

of life was improved without a history of fatigue. **Conclusion:** Our study enabled us to assess mean quality of life scores according to the CLDQ-HBV dimensions, and to identify factors associated with the quality of life of chronic HBV carrier patients. Public health measures such as early diagnosis and management, and free care related to this infection would improve the quality of life of these patients.

Keywords

Hepatitis B Virus, Chronic Carrier, Quality of Life, CLDQ-HBV

1. Introduction

Viral hepatitis is an inflammatory liver illness caused mostly by infection with hepatotropic viruses, which include the five classic viruses A, B, C, D, and E. Viruses B, C, and D are capable of being carried on a long-term basis. According to the World Health Organization (WHO), 325 million people worldwide are chronically infected with the hepatitis B or C virus [1]. Chronic hepatitis B is the major cause of liver disease mortality, accounting for 260 million cases worldwide. In terms of morbidity and mortality, viral hepatitis B is the leading cause, ahead of HIV infection, Tuberculosis, malaria [2]. As a result, it is a significant public health issue worldwide, particularly in Africa, where it affects around 75 million people. Burkina Faso is predicted to have 1.9 million cases, putting the country in the high-endemicity zone with a 9.1% prevalence [3].

The WHO defined health in 1986 as "a resource for daily living, not a goal in itself, which empowers people to identify and realize their ambitions, satisfy their needs and evolve with or adapt to their environment" [4]. This definition stresses the functional element of health, which is viewed as an asset that allows individuals to perform core duties and, most importantly, achieve personal fulfillment. As a result, health becomes synonymous with quality of life. Quality of life is a highly subjective, multidimensional notion that is heavily influenced by individuals' socio-cultural beliefs. Nonetheless, in 1993, the WHO provided a consensus-based definition: "Quality of life is described as an individual's sense of his or her place in life, within the framework of the culture and value system in which he or she lives, and in relation to his or her objectives, aspirations, conventions, and worries. It is a broad term that can be modified in various ways by the subject's physical health, psychological condition, level of independence, social interactions, and relationship to the important parts of his or her environment." [5]. As a result, quality of life appears to be linked to a number of factors, the most important of which is health. This is referred to as health-related quality of life (HRQoL), which assesses the patient's physiological, psychological, and social components [6]. In recent decades, the concept of "patient-centered care" in clinical research and practice, as well as the economic evaluation of patient care, has led to an increased focus [7] on patient quality of life as perceived by the patient himself/herself,

as studies have shown that when HRQoL was assessed by clinicians, it was underestimated for certain types of patients, thus the use of patient-reported outcomes [7]. Assessing overall quality of life is obviously difficult, if not impossible. This issue persists even when limited to a single metric, such as health. That is why, in this subject (health), quality of life has been measured using numerous tools, ranging from generic to particular.

In addition to its effect on life expectancy [7], chronic viral hepatitis B, a global public health issue, is likely to have an impact on the quality of life of its millions of carriers globally. Indeed, the findings of investigations on this subject are contentious [8]-[11]. While some find that, without complications, quality of life is equal to that of the general population [11] or of "healthy" controls [16], others find that quality of life is impaired at all stages of the disease [12], though it is most obvious at advanced stages of the disease, such as cirrhosis and hepatocellular carcinoma [11]. The great majority of these assessments have been conducted with general or unspecific measurement tools [13] [14]. If these misunderstandings are to be resolved, the impact of viral hepatitis B on health-related quality of life should be examined on a regular basis, as well as using a specialized tool. In the current investigation, we used a novel measure [10] unique to chronic viral hepatitis B, the Chronic Liver Disease Questionnaire—Hepatitis B Virus (CLDQ-HBV), to assess HRQoL among its carriers at the Yalgado OUEDRAOGO University hospita (CHUYO). This will allow us to explain the natural history of health-related quality of life (HRQoL) in chronic HBV carriers, maybe quantify the effect of certain health interventions on this HRQoL, and, most importantly, identify areas where novel, tailored interventions could help improve this HRQoL.

2. Method

2.1. Study Framework, Period and Type

Our research took place in the hepato-gastroenterology department of the Yalgado OUEDRAOGO University Hospital. We conducted a descriptive and analytical cross-sectional study using prospective data collection from January 31 to May 31, 2022.

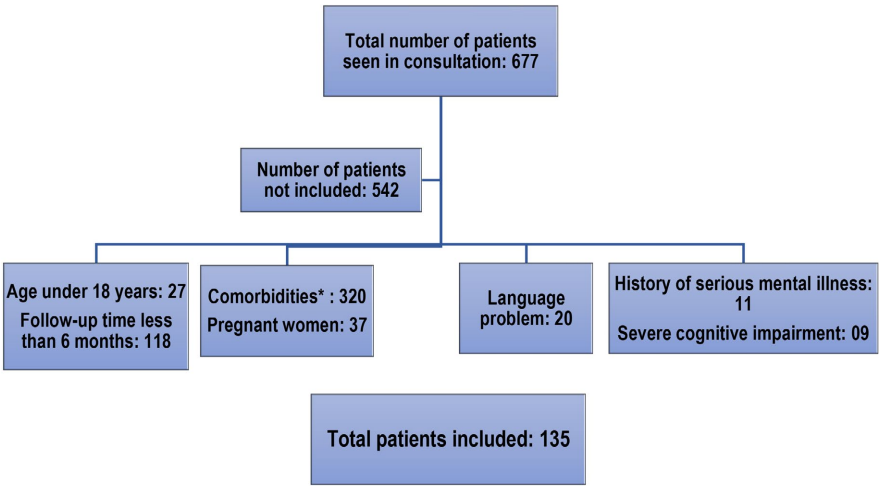
2.2. Study Population

The source population included all chronic HBsAg-positive patients at Yalgado OUEDRAOGO University Hospital. The source population included all chronic HBsAg-positive patients at Yalgado OUEDRAOGO University Hospital. The study population was comprised of chronic HBsAg carriers meeting the inclusion criteria and being included in our study.

2.3. Sampling and Sample

We systematically presented the study to everyone who contacted the department during the study period in order to choose study participants. Only individuals who satisfied our inclusion criteria and provided their consent were eligible to

participate in the study; participation was entirely voluntary. Only HBsAg carriers aged at least 18 years, followed for at least six months, on treatment or not, and having given their free and informed consent to participate in the study, were included in the study. Known chronic HBV carriers who were pregnant, co-infected with HIV, HCV, or HDV, had a history of serious mental illness other than depression, had language problems, or had severe cognitive impairment were excluded from the study. The study also excluded patients on interferon therapy, those who had not provided their consent, and those with any pathology that could negatively affect quality of life (e.g., cancer, severe heart disease, chronic bronchopneumopathy, chronic kidney disease, decompensated cirrhosis, bariatric surgery, etc.). Finally, 135 chronic carriers of viral hepatitis B seen in consultation during the study period were included in the study (Figure 1).



*Cancer, severe heart disease, chronic bronchopneumopathy, chronic kidney disease, decompensated cirrhosis, bariatric surgery.

Figure 1. Flow chart for the selection of chronic hepatitis B carriers.

2.4. Data Processing and Analysis

Data were collected in one step using a form that includes the study participants' sociodemographic, clinical, and paraclinical variables, as well as the CLDQ-HBV questionnaire. Data were entered using a microcomputer running the French version of EPI-INFO 7.2 statistical processing software. Quantitative variables were described numerically, including averages and standard deviations, as well as minimum and maximum values. For data analysis, the T-test was employed to compare mean scores for variables with two modalities, while variance homogeneity was taken into consideration. When the variable had more than two modalities, the ANOVA test was employed; if the ANOVA was not applicable, the Kruskal-Wallis test was utilized. To find the variables related to quality of life, we first used univariate linear regression by quality of life domain and overall. To assess overall quality of life, factors with a p-value < 0.20 in univariate analysis were chosen for multivariate regression. Statistical significance was maintained at $p < 0.05$.

3. Results

Over the study period, a total of 677 patients were seen in consultation, of whom 135 chronic hepatitis B virus carriers met our selection criteria and were therefore included in our study. The flow chart below gives further details of the patients seen in consultation.

3.1. Socio-Demographic Characteristics of the Study Population

The patients' mean age was 41.62 ± 10.69 years, with a sex ratio of 1.81. Table 1 displays the distribution of patients based on socio-demographic factors.

Table 1. Distribution of chronic hepatitis B virus carriers admitted for care at Yalgado OUEDRAOGO University Hospital from January 31 to May 31, 2022, by socio-demographic variables (n = 135).

Socio-demographic characteristics	Number	Percentage (%)
Age groups (years)		
<40	58	42.96
[40; 60[	66	48.89
≥60	11	8.15
Sex		
Male	87	64.44
Marital status		
Single	19	14.07
Divorced or separated	2	1.48
Married or in couple	112	82.96
Widowed	2	1.48
Level of education		
Not in school	12	8.89
Primary	11	8.15
Secondary	23	17.04
Higher	89	65.93
Profession		
Pupils/students	7	5.19
Housewives	11	8.15
Public employees	74	54.81
Retirees	8	5.93
Unemployed	3	2.22
Informal sector	32	23.70
Monthly income (in FCFA)		
<50,000	23	17.04
[50,000; 100,000[	17	12.59

Continued

[100,000; 200,000[	14	10.37
≥200,000	81	60.00
Residence		
Outside Ouagadougou	31	22.96
Inside Ouagadougou	104	77.04

3.2. Study Participants' Clinical Characteristics

The patients had a mean body mass index (BMI) of 25.65 kg/m^2 (±4.67). HBV infection lasted an average of 8.11 ± 6 years, with a maximum of 25 years. The majority (53.33%) were not on treatment. The average treatment duration was 4.1 ± 3.53 years, with a maximum of 16 years. Table 2 displays the distribution of patients based on clinical variables.

Table 2. Distribution of chronic hepatitis B virus carriers admitted for care at Yalgado OUEDRAOGO University Hospital between January 31 and May 31, 2022, according to clinical characteristics and medical history.

Clinical features and medical history	Number	Percentage (%)
Body mass index in kg/m^2 (n = 135)		
<25	63	46.67
[25; 30[	49	36.30
[30; 35[	16	11.85
[35; 40[	5	3.70
≥40	2	1.48
Time to treatment (in years) (n = 135)		
<1	95	70.37
≥1	40	29.63
Duration of infection (in years) (n = 135)		
<5	49	36.30
[5; 10[	42	31.11
≥10	44	32.59
Duration of treatment (in years) (n = 63)		
<5	45	71.43
[5; 10[	13	20.63
≥10	5	7.94
Comorbidities (n = 23)		
Hypertension arterial disease	13	56.52
Diabetes	10	43.48
Glaucoma	4	17.39
Metabolic syndrome	4	17.39

Continued

Chronic kidney disease	3	13.04
Sickle cell disease	1	4.35
History of depression (n = 135)		
No	118	87.41
Yes	17	12.59
History of fatigue (n = 135)		
No	114	84.44
Yes	21	15.56

3.3. Paraclinical Characteristics of the Research Population

The average viral load was 388,700 IU/mL, with ranges of <10 IU/mL to 42,000,000 IU/mL. Sixteen patients (14.95%) had ALAT and ASAT levels that were 4.3 times (171 IU/mL) and 3.1 times (124 IU/mL) higher than the upper normal limit. The mean elasticity of the patients' livers measured by pulse elastometry (FibroScan®) was 6.3 kilopascals (kPa), with extremes of 3.1 and 24.8 kPa. Table 3 displays the distribution of patients based on their paraclinical characteristics.

Table 3. Distribution of chronic hepatitis B virus carriers admitted for care at Yalgado OUEDRAOGO University Hospital between January 31 and May 31, 2022, by biological and morphological characteristics.

Biological and morphological characteristics	Number	Percentage
Biological testing		
HBeAg (n = 120)		
Negative	114	95
Positive	6	5
HBV viral load (IU/mL) (n = 116)		
<10 (undetectable)	54	46.55
[10; 2000[	45	38.79
[2000; 20,000[	10	8.62
[20,000; 200,000[	2	1.72
≥200,000	5	4.31
Transaminases (UI/mL) (n = 107)		
ALAT ≤ 40	93	86.92
ALAT >40	14	13.08
ASAT ≤ 40	99	92.52
ASAT > 40	8	7.48
Hemoglobin (g/dL) (n = 28)		
<10	26	92.86
≥10	2	7.14

Continued

Morphological examinations		
Abdominal ultrasound (n = 102)		
Normal	65	63.73
Fine-grained liver	4	3.92
Signs of cirrhosis	2	1.96
Hepatic steatosis	31	30.39
Liver fibrosis (n = 98)		
Stage F0-F1	80	81.63
Stage F1-F2	10	10.21
Stage F2-F3	3	3.06
Stage F3-F4	5	5.10
Hepatic steatosis (n = 98)		
Stage S0	48	48.98
Stage S1	16	16.33
Stage S2	15	15.30
Stage S3	19	19.39

3.4. Study Population Quality of Life According to CLDQ-HBV

The overall CLDQ-HBV quality-of-life score for the study population was 5.95 ± 0.90, with mean values for the emotional, tiredness, systemic symptoms, anxiety, and sleep domains being 6.05 ± 1.08, 5.71 ± 1.29, 6.32 ± 0.80, 5.39 ± 1.66, and 6.30 ± 1.08, respectively. While the lack of a history of depression statistically enhanced all aspects of quality of life ($p < 0.001$), gender was statistically associated with other aspects of quality of life, except fatigue ($p = 0.102$) and worry ($p = 0.152$).

On the other hand, no dimension of quality of life was linked to age, marital status, education, monthly income, place of residence, body mass index, duration of infection, presence of HBeAg, viral load, liver fibrosis, or hepatic steatosis. The study population's mean scores are compared according to particular variables in Table 4.

Table 4. Comparison of mean quality-of-life scores for patients with chronic hepatitis B virus admitted to Yalgado OUEDRAOGO University Hospital between January 31 and May 31, 2022, according to sociodemographic, clinical, biological, and morphological parameters, and medical history (n = 135).

Characteristics	Emotion		Fatigue		Systemic symptoms		Worry		Sleep		Overall	
	Average score	p-value	Average score	p-value	Average score	p-value	Average score	p-value	Average score	p-value	Average score	p-value
Age groups (in years)												
<40	6.00		5.89		6.35		5.14		6.45		5.96	
[40; 60[	6.17	0.289	5.66	0.152	6.41	0.169	5.50	0.203	6.25	0.605	6.00	0.492
≥60	5.64		5.09		5.60		6.03		5.86		5.65	

Continued

Sex											
Male	6.24	**0.018**	5.85	0.102	6.43	**0.030**	5.55	0.152	6.45	**0.050**	6.10	**0.016**
Female	5.72		5.46		6.12		5.09		6.00		5.68	
Marital status											
Single	6.02		5.81		6.17		5.00		6.37		5.87	
Divorced or separated	6.09	0.190	5.71	0.402	6.35	0.523	5.46	0.077	6.30	0.762	6.00	0.081
Married or in couple	3.67		4.20		5.66		2.83		5.50		4.37	
Widowed	6.50		6.00		6.16		6.33		6.25		6.25	
Level of education											
Not in school	5.88		5.30		6.05		5.80		6.00		5.81	
Primary	5.25	0.160	5.40	0.118	6.39	0.342	4.33	0.142	6.18	0.572	5.51	0.154
Secondary	5.92		5.33		6.13		5.37		6.17		5.78	
Higher	6.20		5.90		6.39		5.46		6.39		6.07	
Monthly incomes (in FCFA)											
$<5 \times 10^4$	5.66		5.40		6.04		5.19		6.00		5.66	
$[5 \times 10^4; 10^5[$	5.88	0.151	5.56	0.560	6.49	0.419	4.84	0.216	6.38	0.384	5.83	0.297
$[10^5; 2 \times 10^5[$	5.99		5.87		6.50		6.05		6.86		6.05	
$\geq 2 \times 10^5$	6.21		5.80		6.33		5.44		6.33		6.05	
Place of residence											
Ouagadougou	6.07	0.780	5.64	0.148	6.29	0.476	5.33	0.463	6.29	0.838	5.92	0.468
Outside Ouagadougou	6.01		5.96		6.40		5.58		6.33		6.06	
Body mass index (kg/m²)											
<25	6.02		5.72		6.37		5.47		6.47		6.01	
[25; 30[	6.35	0.347	6.02	0.388	6.23	0.809	4.95	0.410	6.43	0.154	6.00	0.706
≥ 30	5.97		5.56		6.30		5.47		6.05		5.87	
Duration of infection (in years)											
<5	6.04		5.71		6.32		5.31		6.31		5.94	
[5; 10[	6.08	0.983	5.68	0.986	6.31	0.467	5.04	0.941	6.32	0.973	5.89	0.751
≥10	6.04		5.73		6.32		5.80		6.27		6.03	
Treatment status											
Treated	6.16	0.277	5.62	0.440	6.28	0.561	5.68	**0.05**	6.23	0.462	6.00	0.651
Untreated	5.96		5.79		6.36		4.13		6.37		5.92	
History of depression											
Yes	4.14	**<0.001**	4.38	**<0.001**	5.51	**0.002**	4.07	**<0.001**	4.79	**<0.001**	4.58	**<0.001**
No	6.33		5.90		6.44		5.58		6.52		6.15	
Fatigue history											
Yes	5.22	**0.007**	3.81	**<0.001**	5.58	**<0.001**	4.79	0.073	5.33	**0.001**	4.95	**<0.001**
No	6.21		6.06		6.45		5.50		6.48		6.14	

Continued

Comorbidity										
Yes	6.05	0.954	5.48	0.329	5.89	**0.036**	5.33	0.917	6.15	0.614	5.78	0.341
No	6.07		5.78		6.40		5.37		6.31		6.00	
Diabetes										
Yes	6.02	0.911	5.04	0.080	5.73	**0.015**	5.13	0.616	6.20	0.754	5.63	0.223
No	6.08		5.76		6.37		5.40		6.31		5.98	
HBeAg										
Negative	6.07	0.166	5.70	0.347	6.31	0.218	5.43	0.914	6.32	0.835	5.97	0.366
Positive	6.67		6.20		6.72		5.50		6.42		6.30	
Viral load (in IU/mL)										
<10	6.14		5.62		6.28		5.43		6.17		5.93	
[10; 2×10^3[	6.14		5.70		6.20		5.51		6.41		5.94	
[2×10^3; 2×10^4[	5.88	0.253	5.74	0.941	6.67	0.396	5.93	0.409	6.90	0.363	6.37	0.501
[2×10^4; 2×10^5[	6.58		6.40		7.00		6.00		6.25		6.52	
≥2×10^5	6.92		5.64		6.26		4.26		6.30		5.65	
Liver fibrosis										
Stage F0-F1	6.22		5.71		6.38		5.67		6.31		6.06	
Stage F1-F2	6.48	0.183	5.72	0.984	6.47	0.316	5.93	0.337	6.30	0.990	6.18	0.371
Stage F2-F3	5.11		6.00		6.00		4.33		6.50		5.59	
Stage F3-F4	5.96		5.80		5.73		5.07		6.40		5.79	
Hepatic steatosis										
Stage S0	6.07		5.50		6.25		5.51		6.23		5.91	
Stage S1	6.65	0.135	6.23	0.195	6.37	0.721	5.63	0.830	6.84	0.139	6.34	0.674
Stage S2	5.82		5.63		6.51		5.91		6.03		5.98	
Stage S3	6.46		5.97		6.40		5.70		6.34		6.18	

3.5. Associated Factors with Quality of Life in Chronic Hepatitis B Virus Carriers

The overall CLDQ-HBV quality-of-life score of chronic hepatitis B virus carriers included in our study was strongly associated with gender ($p = 0.009$), history of depression ($p < 0.001$) and fatigue ($p < 0.001$). The "systemic symptoms" component was significantly associated with a history of fatigue ($p = 0.002$), but not with a history of depression ($p = 0.061$). However, the "worry" dimension of quality of life is not linked to a history of depression ($p = 0.354$) or fatigue ($p = 0.519$). Table 5 shows the factors associated with the different dimensions of quality of life assessed by our questionnaire.

Table 5. Factors related with the quality of life of chronic hepatitis B virus patients admitted to Yalgado OUEDRAOGO University Hospital between January 31 and May 31, 2022, based on sociodemographic, clinical, biological, and morphological parameters, as well as medical history.

Associated factors	Emotion			Fatigue			Systemic symptoms			Worry			Sleep			Overall		
	ORa	IC95%	p-value	ORa	IC95%	p-value	ORa	IC95%	p-value	ORa	IC95%	p-value	ORa	IC95%	p-value	ORa	IC95%	p-value
Sex																		
Female	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-
Male	0.23	[0.09; 3.56]	0.153	1.45	[1.02; 6.89]	**0.041**	0.28	[0.09; 0.95]	0.143	0.23	[0.57; 1.03]	0.563	0.22	[0.19; 1.64]	0.288	0.42	[0.10; 1.73]	**0.009**
Marital status																		
Single	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-
Divorced or separated	1.14	[0.29; 8.57]	0.516	0.91	[0.60; 2.58]	0.961	1.05	[0.16; 8.61]	0.237	0.60	[0.46; 1.66]	0.263	2.00	[0.22; 7.18]	0.452	1.12	[0.32; 3.55]	0.602
Married or in couple	1.16	[1.33; 11.2]	0.792	0.76	[0.20; 4.32]	0.338	0.61	[0.22; 11.7]	0.339	1.62	[1.39; 4.16]	0.249	1.15	[0.98; 82.6]	0.66	1.15	[0.82; 12.20]	0.024
Widowed	1.37	[0.1; 15.55]	0.532	1.08	[0.92; 3.84]	0.725	1.9	[0.63; 98.4]	0.163	1.32	[0.46; 4.12]	0.347	0.96	[0.94; 9.07]	0.441	0.87	[0.04; 1.68]	0.572
Level of education																		
Not in school	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-
Primary	1.02	[0.81; 4.78]	0.971	0.72	[0.38; 1.82]	0.194	1.23	[0.68; 11.1]	0.615	0.58	[0.44; 2.60]	0.567	0.98	[0.27; 3.64]	0.975	1.30	[1.04; 0.44]	0.428
Secondary	0.31	[0.33; 0.96]	0.331	0.63	[0.22; 1.48]	0.142	1.38	[0.07; 4.30]	0.267	1.23	[0.74; 1.27]	0.759	0.93	[0.30; 3.04]	0.901	1.03	[0.66; 0.61]	0.938
Higher	0.36	[0.25; 0.97]	0.44	0.76	[0.03; 1.54]	0.58	1.02	[0.70; 7.65]	0.944	1.46	[0.91; 7.85]	0.500	2.94	[0.29; 68.8]	0.400	1.26	[0.28; 9.81]	0.344
Monthly incomes (in FCFA)																		
<50,000	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-
50,001 à 100,000	0.93	[0.03; 5.57]	0.911	1.76	[096; 3.23]	0.067	0.70	[0.02; 1.39]	0.61	1.20	[0.24; 4.63]	0.787	1.32	[0.37; 11.1]	0.594	1.17	[0.40; 6.74]	0.201
100,001 à 200,000	1.08	[0.52; 12.7]	0.799	1.22	[0.54; 2.76]	0.625	0.66	[0.06; 1.31]	0.43	1.71	[0.74; 12.2]	0.330	1.18	[0.50; 7.85]	0.357	0.39	[0.21; 11.2]	0.550
Plus de 200,000	2.18	[0.43; 30.8]	0.754	8.00	[0.77; 25.56]	0.158	1.16	[0.39; 8.71]	0.564	1.43	[0.59; 6.72]	0.456	1.04	[0.48; 10.5]	0.892	1.39	[0.04; 2.80]	0.071
Depression history																		
Yes	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-
No	1.78	[1.24; 2.32]	**<0.001**	1.67	[1.30; 3.05]	**0.035**	1.44	[0.90; 3.02]	0.061	1.81	[1.57; 4.57]	0.354	1.63	[1.12; 3.12]	**<0.0001**	1.57	[1.05; 3.19]	**<0.001**
Fatigue history																		
Yes	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-
No	1.42	[0.80; 3.02]	**0.038**	2.23	[1.78; 4.67]	**<0.001**	1.64	[1.05; 4.24]	**0.002**	1.31	[1.27; 5.65]	0.519	1.72	[1.18; 4.25]	**0.0026**	1.19	[1.02; 3.82]	**<0.001**

4. Discussion

Despite the limitations of our study (small sample size, the absence of a control group (HBV-negative individuals), the quality-of-life measurement instrument used, which is a new tool with no translated and validated version in either French or the population's vernacular languages), which could be sources of bias, we were able to assess the quality of life of chronic hepatitis B virus carriers. Studies have previously shown that uncomplicated, unevolved hepatitis does not harm quality of life. Our goal was to evaluate the factors that contribute to quality of life degradation in HBV patients who do not have any related comorbidities.

In spite of these restrictions and restraints, the current study's findings can be compared to earlier studies on the issue, as well as scientific information found in journals, periodicals, and books. Overall, quality of life was linked with gender, history of depression, and history of fatigue among respondents (ORa = 0.42 ($p = 0.009$), ORa = 1.57 ($p < 0.001$), and ORa = 1.19 ($p < 0.001$). According to the many aspects of quality of life, the male sex had a 1.45 times higher quality of life than the female sex ($p = 0.041$) in the "fatigue" dimension, with no relationship in the other dimensions. Patients without a history of depression had higher quality of life in "emotion" (ORa = 1.42; $p < 0.001$), "fatigue" (ORa = 1.67; $p = 0.035$), and "sleep" (ORa = 1.63; $p < 0.0001$). Finally, our study found that individuals with no history of fatigue had a superior quality of life in dimensions "emotion" (ORa = 1.42; $p = 0.038$), "fatigue" (ORa = 2.23; $p < 0.0001$), and "systemic symptoms" (ORa = 1.64; $p = 0.002$).

4.1. Socio-Demographic Features

Our respondents had an average age of 41.62 years [18; 80 years], which was lower than that of STEVEN *et al.* in 2020 in Australia [7], BUTI *et al.* in 2021 in Spain [15], and LI *et al.* in 2020 in China [16], who found average ages of 58.9, 51.8, and 47 years, respectively. On the other hand, it is comparable to those of SOMBIE *et al.* in Burkina Faso in 2015 [17], MAHASSADI *et al.* [18] in Côte d'Ivoire in 2020, KARACAER *et al.* in Türkiye in 2015 [8], and WEINSTEIN *et al.* in the United States in 2010 [19], who discovered mean ages of 40, 42, 40, and 43.6, respectively.

In each of these investigations, the patients were young adults. Our findings could be explained by the fact that Burkina Faso has a younger population than other countries with low birth rates, such as Australia and China, where the population is substantially older. However, if we had not omitted the under-18s and had not delayed hepatitis screening and treatment in our environment, we could have had a lower average age, especially since chronic hepatitis B is transmitted in the majority of cases during the perinatal period or in infancy. Furthermore, young people are more likely to be affected by awareness-raising activities in the workplace, universities, schools, and youth organizations. In view of these findings, it would be appropriate to continue promoting awareness among all socio-professional strata about HBV screening, management, and potential problems. On the other hand, popularizing vaccination against viral hepatitis B would help

to diminish the infection's prevalence in our country.

Males were the most represented in our study (64.44%), as in studies by SOMBIE *et al.* [17] in 2015 (82.5%), SOMDA *et al.* in 2016 in Burkina Faso (71.42%) [20], SAFFARI *et al.* in 2017 in Iran [21] (77.3%), and YOUNOSSI *et al.* in the USA in 2019 [22] (61.4%). However, this finding differs from that of DRAZIC *et al.* [23] in Australia in 2013 and LI *et al.* [16] in China in 2020, when women constituted the majority, with frequencies of 55% and 65.6%, respectively. According to MEDA *et al.* [3], the higher frequency of viral hepatitis (B and C) among men in Burkina Faso may explain our findings. In the present socio-cultural setting, despite the fact that women make up the majority of the general population, they are less emancipated, with men wielding economic and decision-making authority in most countries. A woman must receive her husband's authorization and agreement before making some decisions, such as whether to seek a consultation or participate in health awareness initiatives [24]. On the other hand, in developed countries where women are the majority and more autonomous, with health coverage and policies (universal health insurance, for example) that make care accessible even to the most disadvantaged sections of society, it is not surprising that women outnumber men in their studies. We must thus take steps to promote and empower women in healthcare.

4.2. Quality of Life for Chronic Carriers of Viral Hepatitis B

The average CLDQ-HBV score for the study sample was 5.95 ± 0.90, with extremes of 2.90 and 7. This score is similar to that of YOUNOSSI *et al.* [25] in the USA in 2021, LAM *et al.* [26] in China in 2009, and BONDINI *et al.* in the USA in 2007 [27]. During the development and validation of the CLDQ-HBV, they found 5.7, 5.9 ± 0.8, and 6.0 ± 0.9.

Our high mean score is explained by the study population's sociodemographic, clinical, and paraclinical characteristics, which are primarily composed of chronic HBV carriers with no sequelae and minimal comorbidities. In the case-control research (5.2) by OBRADOVIC *et al.* [28], this score was greater than that of "healthy" controls. People in our socio-cultural setting are less likely to complain about health concerns and instead seek medical attention when symptoms worsen. This research emphasizes the necessity of early diagnosis, follow-up, and management, which should be promoted. Most patients have been watched for several years before experiencing difficulties.

Our mean score was greater than those of ZHUANG *et al.* [29] in 2014 in China and DRAZIC *et al.* [23] in 2013 in Australia, who used the CLDQ and got mean scores of 5.2 ± 0.8 and 4.31 ± 1.58. This finding is owing to the fact that the populations in these studies consisted of elderly patients who were carriers of the hepatitis B virus and had comorbidities, with a female majority. It should be noted that CLDQ and CLDQ-HBV differ in several respects. Furthermore, the sample sizes in the first two trials (1339 and 460 patients, respectively) may provide stronger statistical power (and thus internal and external validity).

Our findings also indicate that women had lower mean scores than men. This difference was significant for the overall CLDQ-HBV ($p = 0.016$), "emotion" ($p = 0.018$), "systemic symptoms" ($p = 0.030$), and "sleep" ($p = 0.05$) domains. These findings indicate that men had a higher quality of life than women, although research by YOUNOSSI *et al.* [25], MEJDOUB *et al.* in Tunisia in 2016 (SF-36) [30], and MAHASSADI *et al.* [18] found no significant difference in the quality of life based on gender. This could be explained by the fact that males in our environment have more financial independence, allowing them to obtain healthcare and contribute to their health status.

Furthermore, kids do not require the permission of anyone in their family to seek medical attention, emphasizing the importance of acting to promote equitable access to healthcare in our country.

Other findings from our study indicate a significant difference ($p = 0.036$) in quality of life in the "Systemic symptoms" domain between those with comorbidities (mean score = 5.89) and those without (mean score = 6.40). This was true for diabetes patients (mean score 5.73) versus non-diabetics (mean score 6.37), with a p-value of 0.015. This result is consistent with those described in the literature [25]. This is related to the systemic symptoms and difficulties of comorbidities like diabetes, which further reduce quality of life.

4.3. Factors Related to Quality of Life in Chronic Carriers of Viral Hepatitis B

The lack of a history of depression increased overall quality of life by 1.57 times ($p < 0.001$), as well as in the domains of "emotion" (ORa = 1.78; $p < 0.001$), "fatigue" (ORa = 1.67; $p = 0.035$), and "sleep" (ORa = 1.63; $p < 0.0001$). This finding is consistent with the existing literature. Research consistently shows that depression has a negative impact on quality of life, as shown by ALTINDAG *et al.* in Türkiye in 2005 [31], WEINSTEIN *et al.* in the USA [19], Li *et al.* ($p < 0.0001$) [16], and KESKIN *et al.* in Türkiye in 2013 [32]. Depression is also linked to certain chronic diseases. One study found that more than 90% of chronic HBV carriers are at risk of depression [31]. It is apparent that living with a chronic illness like HBC, not being able to enjoy life like the people around you, and being aware of the potential complications (cirrhosis, hepatocellular cancer) can contribute to depression. Depression may also be caused by the necessity for follow-up and, in some cases, lifetime treatment, as well as the associated economic costs and social stigma. To improve these patients' quality of life, psychosocial therapies in addition to antiviral chemotherapy are required. Interventions like those used and recommended in the CHAO *et al.* study [33] may assist in modifying this situation.

The absence of a fatigue history improved overall quality of life by 1.19 times compared to the presence of a fatigue history ($p < 0.001$), as well as in the domains of "emotion" (ORa = 1.42; $p < 0.001$), "fatigue" (ORa = 2.23; $p < 0.001$), "systemic symptoms" (ORa = 1.64; $p = 0.002$), and "sleep" (ORa = 1.72; $p = 0.0026$). Numerous research studies have confirmed the link between fatigue and quality of

life in chronic HBV infection. These are WANG *et al.* [34], GUPTA *et al.* [35], and SAFFARI *et al.* [21]. Fatigue is a recurring yet non-specific sign of chronic liver disease [36] [37].

It could be the result of general or systemic hepatitis, secondary to liver damage because the liver plays a role in many of the body's functions - quite simply, it's the body's laboratory - or inherent to extra-hepatic manifestations of HBV, diagnosed or sometimes undiagnosed comorbidities, or even the result of intense, repetitive, and inappropriate physical activity, sometimes socio-professional. Asthenia occurs in both the early and severe phases of the disease. All of these variables explain the link between "hepatitis and fatigue," which is sometimes the reason for consultation and leads to the diagnosis of HBV infection. Studies have assessed the intensity of fatigue in hepatitis B.

They demonstrated that it was significant in comparison to controls and was even associated with autonomic dysfunctions (altered cognitive functions and sleep problems, non-encephalopathic) and an increase in CLDQ scores [33], without the severity of fatigue being related to biochemical or histological parameters of the hepatic disease [38] [39]. This importance, as well as the effects of weariness, may explain the severe reduction in quality of life and the link between the two. It is, therefore, necessary to conduct interventions aimed at improving the state of fatigue among chronic HBV patients in order to improve their quality of life. In comparison to the female, our male respondents had a significantly higher quality of life (ORa = 0.42, p = 0.009), despite the fact that in the "fatigue" domain, female respondents had a 1.45-fold higher quality of life than male participants. This finding is supported by other studies in the literature. We have those of Kim *et al.* [40], KARACAER *et al.* [8], LAM *et al.* [24], and YOUNOSSI *et al.* [22]. The changes in society have resulted in women being as active as men, if not more so when one considers their socioprofessional commitments and household chores. She would also be more prone to anxiety ("worry" domain) and less emotionally secure than men. According to one study, housewives had lower weariness levels than men [15]. However, in our study, the low sample of housewives (n = 11) may explain our findings.

While the study identified fatigue as a key factor impacting QoL, it did not delve into the potential causes or contributing factors to fatigue in this population. Further investigation into the etiology of fatigue, including potential associations with disease severity, treatment side effects, or psychological distress, was warranted. This would enable the development of targeted interventions to address fatigue and potentially improve QoL among chronic HBV carriers.

All of these factors, among others, explain why men outperform women in the majority of CLDQ-HBV domains, as well as the link of the male sex with a higher quality of life.

5. Conclusion

Our investigation allowed us to calculate mean quality of life scores based on the

various components of the CLDQ-HBV model and identify characteristics associated with quality of life in chronic HBV carrier patients. However, we have been unable to assess the impact of chronic HBV carriers on quality of life when compared to the local general population, and case-control studies could provide a complete picture of the impact of chronic carriage in the absence of problems on quality of life. Public health initiatives such as adding the viral hepatitis B vaccine in the Expanded Program on Immunization, early detection and treatment, and free care for this virus would all assist in reducing the morbidity and mortality associated with this disease.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix. Chronic Liver Desease Questionnaire-Hepatitis B Virus (CLDQ-HBV) Questionnaire

To what extent does this problem bother you?

A. Emotional domain (EF)

1 = All of the time. 2 = Most of the time. 3 = A good bit of the time. 4 = Some of the time. 5 = A little of the time. 6 = Hardly any of the time. 7 = None of the time.

Questions	Answers						
	1	2	3	4	5	6	7
How long in the last 2 weeks have you felt anxious?							
How long in the last 2 weeks have you felt unhappy?							
How long in the last 2 weeks have you felt irritable?							
How long in the last 2 weeks have you had mood swings?							
How long in the last 2 weeks have you felt depressed?							
How long in the last 2 weeks have you had trouble concentrating?							

B. Fatigue domain (FA)

1 = All of the time. 2 = Most of the time. 3 = A good bit of the time. 4 = Some of the time. 5 = A little of the time. 6 = Hardly any of the time. 7 = None of the time.

Questions	Answers						
	1	2	3	4	5	6	7
For how long during the last 2 weeks did you feel tired?							
How long in the last 2 weeks have you felt sleepy during the day?							
For how long in the last 2 weeks have you been bothered by reduced strength?							
For how long during the last 2 weeks have you felt a decrease in your energy level?							
For how long in the last 2 weeks have you felt sleepy?							

C. Systemic symptoms (SS)

1 = All of the time. 2 = Most of the time. 3 = A good bit of the time. 4 = Some of the time. 5 = A little of the time. 6 = Hardly any of the time. 7 = None of the time.

Questions	Answers						
	1	2	3	4	5	6	7
For how long during the past 2 weeks have you felt body aches?							
How long in the last 2 weeks have you had muscle cramps?							
How long in the last 2 weeks have you had dry mouth?							

D. Worry domain (WO)

1 = All of the time. 2 = Most of the time. 3 = A good bit of the time. 4 = Some of the time. 5 = A little of the time. 6 = Hardly any of the time. 7 = None of the time.

Questions	Answers						
	1	2	3	4	5	6	7
How long in the last 2 weeks have you worried about the impact of your liver disease on your family?							
How long in the last 2 weeks have you worried that your symptoms will become a major problem?							
How long in the last 2 weeks have you been worried about your (health) condition worsening?							

E. Sleep domain (SL)

1 = All of the time. 2 = Most of the time. 3 = A good bit of the time. 4 = Some of the time. 5 = A little of the time. 6 = Hardly any of the time. 7 = None of the time.

Questions	Answers						
	1	2	3	4	5	6	7
How long in the last 2 weeks have you had trouble sleeping at night?							
How long in the last 2 weeks have you been unable to sleep at night?							