

Research Article

Unveiling Barriers to Universal Health Coverage: A Cross-Sectional Assessment of the Demand-Side Viewpoints in Northwest Region-Cameroon

Therence Nwana Dingana^{1,*} , Longla Terence Achelieu² ,
Leo Cedric Fosso Fozou³ , Daniel Agwenig Ndisang¹ , Stewart Ndutard Ngasa⁴ 

¹Tubah District Hospital, Regional Delegation of Public Health, Northwest Region, Cameroon

²Public Health, University of Ghana, Accra, Ghana

³Ndop District Hospital, Regional Delegation of Public Health, Northwest Region, Cameroon

⁴The Spinney, Elysium Healthcare, Manchester, United Kingdom

Abstract

Universal Health Coverage (UHC) aims to ensure that everyone has access to quality health services without suffering financial hardship. Health services must be culturally acceptable; otherwise, utilization will remain low despite availability. The understandings and attitudes toward UHC differ across populations, impacting its implementation. This study assessed the knowledge, attitudes, and perceptions of UHC, analyzed the factors associated with these views, and examined the users' preferences for UHC in terms of healthcare provider choice, payment schemes, and factors predicting these choices. This study was conducted in the Northwest Region of Cameroon, with over 3 million inhabitants, in a humanitarian crisis since 2016. A cross-sectional survey included 417 respondents selected through multistage sampling from 20 health districts. Data were collected through face-to-face interviews using pretested questionnaires. Data was entered and analyzed using Excel and SPSS. The association between variables was studied using the Chi-squared test, Student's t-test, and Analysis of Variance (ANOVA). A multiple linear regression was done to eliminate the effect of confounders influencing knowledge and attitudes toward UHC. Ethical considerations included informed consent, data confidentiality, and compliance with the Regional Ethical Committee for Human Health Research (CERSH). Most respondents (77%) had heard of UHC, but only 32.3% knew it reduces out-of-pocket costs. Three-quarters were unaware of the government's UHC goals. While 82.5% desired universal access to cost-effective healthcare, only 6.4% had a good perception of UHC. Nonetheless, 83.3% wanted a National Health Insurance Scheme (NHIS), and 70% wanted it to be compulsory. Higher knowledge scores were found in older age groups ($p=0.020$), urban residents ($p=0.015$), private-sector employees ($p<0.001$), and those with free healthcare access ($p<0.001$). Regarding UHC plan choices, 51.0% had no preference for private or public hospitals, 48.1% believed the government should cover all costs, while 38.0% wanted a mixture, with the wealthier paying more. This study shows significant gaps in knowledge and perceptions of UHC among the population. While there is a strong desire for cost-effective healthcare access, awareness of government initiatives and UHC mechanisms remains low. Policy implications include the need for targeted educational campaigns on UHC. Additionally, considering a compulsory NHIS could foster greater community participation and support backed by their strong willingness to contribute to the NHIS. This will definitely build a resilient health system.

*Corresponding author: dinganatero@yahoo.com (Therence Nwana Dingana)

Received: 21 March 2025; **Accepted:** 31 March 2025; **Published:** 29 April 2025



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Keywords

Barriers to UHC, Demand-side Views, Anglophone Crisis, Healthcare Financing, Universal Health Coverage, Cameroon

1. Introduction

Achieving Universal Health Coverage (UHC) is essential for improving health outcomes, reducing inequalities, and fostering resilient healthcare systems. In the Northwest Region of Cameroon, where conflict and economic disparities compound healthcare challenges, addressing barriers to UHC is a critical step toward equitable access to healthcare services. Despite global advancements, more than half of the world's population lacks essential healthcare services, and Cameroon is no exception [1]. Efforts to implement UHC in Cameroon have made progress, but financial, cultural, and infrastructural barriers continue to impede access, especially for vulnerable populations [2, 3]. Understanding these demand-side barriers, particularly in conflict-affected regions, is vital for tailoring solutions that ensure healthcare is not just available but accessible and utilized [4, 5]. With UHC aligned with global goals like the Sustainable Development Goals (SDGs), specifically SDG 3 [6], the stakes are high for Cameroon to address these challenges head-on. Only by investigating and addressing these barriers can Cameroon move closer to achieving equitable healthcare for all.

Previous research has demonstrated the significance of UHC in addressing global health inequalities, improving access to essential services, and protecting individuals from financial hardship [7]. Studies have shown that UHC contributes to poverty eradication (SDG 1) and gender equality (SDG 5) by improving access to maternal healthcare and reducing out-of-pocket expenses [8]. However, despite these benefits, challenges persist in low- and middle-income countries, including Cameroon, where financial barriers, healthcare infrastructure gaps, and cultural factors continue to hinder UHC's implementation [9, 10]. While research has highlighted the supply-side barriers, there is limited focus on the demand-side factors—such as income, health literacy, and cultural norms—that influence healthcare utilization [11-13, 4, 14]. This study aims to fill this gap by specifically exploring the demand-side barriers in the conflict-affected Northwest Region of Cameroon. Understanding these factors is crucial for designing context-specific interventions to make healthcare more accessible and equitable, addressing not just availability but also actual utilization of services.

Our objective was to explore the demand-side barriers to UHC in the Northwest Region of Cameroon, where healthcare challenges have been made worse by an ongoing humanitarian crisis. First, we assessed the knowledge, attitudes, and perceptions of UHC among the population, highlighting their understanding of the concept. Second, we analyzed the factors

associated with these views, examining how socio-demographic variables, health literacy, and cultural norms shape perceptions of UHC. Third, we investigated the population's preferences regarding healthcare provider choice, financing mechanisms, and payment schemes. By exploring these demand-side perspectives, this study provides valuable insights for policymakers seeking to improve UHC implementation in Cameroon. Understanding these preferences and barriers is crucial for designing tailored interventions that ensure equitable access to healthcare and foster community support for UHC initiatives.

2. Methods

2.1. Study Setting

This study was conducted in the Northwest Region of Cameroon, a region known for its cultural diversity, agricultural importance, and geographic diversity, including both urban and rural areas. The region's population of over 3 million people includes various ethnic groups, such as the Tikari, Widikum, Fulani, and Moghamo, whose differing cultural backgrounds provide a rich context for analyzing perspectives on UHC [15]. Importantly, the region has been severely impacted by a protracted Anglophone crisis since 2016, which has disrupted healthcare, education, and livelihoods. These crises have further strained the healthcare system, particularly in rural areas where access to care is limited [16]. The selection of this setting allows for an in-depth understanding of the demand-side readiness for UHC in a conflict-affected and socio-economically diverse environment.

2.2. Study Design

This study employed a cross-sectional observational design to assess the knowledge, attitudes, and perceptions of UHC in the Northwest Region of Cameroon. Cross-sectional studies are well-suited for examining relationships at a single point in time, making them ideal for understanding the population's current stance on UHC, especially in the context of a region impacted by the Anglophone crisis. This design enabled the researchers to capture data from a diverse set of urban and rural participants, providing a snapshot of demand-side readiness for UHC. Stratified sampling was used to ensure

demographic and geographical diversity, while random sampling was employed at the household level to avoid selection bias.

The study used structured survey questionnaires to gather quantitative data related to knowledge, attitudes, socio-demographic factors, and preferences for UHC financing. The choice of this study design aligns with the aim of exploring how socio-economic factors influence health-seeking behaviors and UHC perceptions. This methodology adheres to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines, ensuring strong reporting of observational studies [17]. This approach is appropriate as it allows for the comprehensive exploration of factors relevant to UHC uptake in a conflict-affected, socio-economically diverse region.

2.3. Data Collection

Data collection for this cross-sectional study was conducted by trained interviewers who were supervised by a team of experienced health researchers. The interviewers were selected based on their familiarity with the Northwest Region of Cameroon and were trained to ensure consistency in data collection methods. Regular supervision and monitoring were conducted by the research team to maintain data quality and adherence to standardized protocols. The data were collected using structured survey questionnaires that covered key areas of interest. These included socio-demographic information, knowledge of UHC, attitudes toward healthcare financing, healthcare-seeking behavior, and preferences for UHC payment schemes. The questionnaire was tailored to the objectives of the study and adapted from validated tools used in previous UHC-related research [18]. Where necessary, the tools were modified to fit the local context, and pilot testing was conducted to ensure clarity and relevance.

Data collection was conducted across all 20 health districts in the Northwest Region of Cameroon, encompassing both urban and rural settings. This geographical spread was vital to capturing a broad spectrum of socio-economic and demographic perspectives on UHC. The surveys were administered face-to-face, enabling engagement with households in remote areas where healthcare access is often limited. Data collection spanned a three-month period, from July 9th to September 28th, 2023. A total of 400 households were selected using a multistage sampling technique. To ensure representativeness, all 20 health districts were included. Within each district, specific health areas were randomly selected. Subsequently, households were sampled proportionately within each health area, reflecting the population distribution. Representativeness in this context was defined by proportional inclusion across districts based on the most recent population estimates from the Regional Delegation of Public Health. The sample size was calculated using Cochran's formula for large populations, with a 95% confidence level and a 5% margin of error, which is in line with standard recommendations for household

surveys. To ensure data quality, the research team employed a structured data validation process, including double data entry using Excel and SPSS. These tools were also used for the rigorous data analysis. Outliers and missing data were managed through consistency checks, logical imputation where appropriate, and removal of responses that failed completeness criteria. Supervisory field checks were conducted throughout to ensure adherence to methodological consistency.

2.4. Data Analysis

To achieve the study objectives, a detailed data analysis process was undertaken using Excel and SPSS software. First, data management and cleaning were performed to ensure accuracy and consistency, including handling missing data, outlier detection, and correcting data entry errors. The data were then analyzed based on the study objectives, focusing on both qualitative and quantitative outcomes.

For descriptive purposes, qualitative data were presented using counts and percentages, offering an overview of the population's socio-demographic characteristics, healthcare-seeking behavior, and attitudes toward UHC. Quantitative data were summarized using means and standard deviations, describing variables such as knowledge levels, attitudes, and perceptions of UHC. Participants' knowledge, attitudes, and perceptions of UHC were categorized into poor (<25%), inappropriate (25-49%), acceptable (50-70%), and good (>70%). These classifications facilitated the analysis of responses, highlighting areas for improvement in understanding and acceptance of UHC principles among the population.

To examine associations between categorical variables (such as knowledge and attitudes toward UHC) and demographic factors, the Chi-squared test (or Fisher's exact test, where appropriate) was applied. Continuous variables were analyzed using the Student's t-test and ANOVA to compare means across different groups. In order to control for confounding variables that could influence knowledge and attitudes toward UHC, a multiple linear regression analysis was conducted. This allowed for adjusting the effects of socio-demographic variables, such as age, income, and education level, on key outcomes. The results are presented in the following order: first, descriptive statistics of the population; second, analysis of the associations between key demographic factors and UHC knowledge and attitudes; and finally, the findings from the multiple linear regression analysis are discussed to explore the most significant predictors of UHC awareness and attitudes.

2.5. Ethics

This study was conducted in full compliance with ethical standards for human health research, as approved by the Regional Ethical Committee for Human Health Research

(CERSH) in the Northwest Region of Cameroon. Ethical considerations were rigorously upheld throughout the research process. Informed consent was obtained from all participants prior to data collection, ensuring they understood the study's objectives, their role in the study, and their rights, including the right to withdraw at any time without repercussions.

To protect participants' privacy, personal information was anonymized, and all data were securely stored and accessed only by authorized research personnel. Confidentiality was strictly maintained, and no identifying information was disclosed in any part of the study's reporting. Additionally, ethical guidelines concerning vulnerable populations, particularly in the context of the ongoing Anglophone crisis, were adhered to, ensuring that participation was voluntary and non-coercive.

3. Results

3.1. Socio-demographic Characteristics

The study collected data on key demographic, educational, and socio-economic variables. The largest age group among participants was 21-30 years, making up 44.0% of the sample; > 70 years (2.6%). Gender distribution was relatively balanced, with females constituting 57.2%. Educational background varied: 34.2% had completed secondary education, 33.5% had tertiary education, and 25.8% had primary education, with 6.5% having no formal education. Occupation-wise, self-employed individuals represented the largest group (33.3%), followed by students (20.1%), while public sector workers constituted the least (15.6%). Marital status was diverse, with 48.8% married and 40.9% single. Most participants were Christian (81.3%), followed by Muslims (17.5%). We found out that only 12.7% of participants had ever had any form of health insurance. Furthermore, only 25.6% of respondents reported having ever had access to free healthcare. See [Table 1](#): Presentation of demographic statistics.

Table 1. Presentation of demographic statistics.

Variables	Number (n=418)	Percentage (%)
Age groups		
≤20	25	6.0
21 - 30	184	44.0
31 - 40	92	22.0
41 - 50	65	15.6
51 - 60	25	6.0
61 - 70	16	3.8

Variables	Number (n=418)	Percentage (%)
71 - 80	7	1.7
>80	4	0.9
Sex		
Male	179	42.8
Female	239	57.2
Level of Education		
None	27	6.5
Primary	108	25.8
Secondary	143	34.2
Tertiary	140	33.5
Profession		
Unemployed	63	15.
Student	84	20.1
Self-employed	139	33.3
Private sector	67	16.0
Public sector	65	15.6
Marital Status		
Single	171	41
Married	204	48.8
Divorced	19	4.5
Widow	24	5.7
Religion		
Christian	340	81.3
Muslim	73	17.5
Atheist	5	1.2
Own an insurance scheme		
Yes	53	12.7
No	365	87.3
Why not		
Cannot afford	44	12
Unawareness	273	74.8
Not compulsory	21	5.8
Don't trust Insurance	19	5.2
Don't need it	4	1.1
Other	4	1.1
Access to free healthcare		
Yes	107	25.6
No	311	74.4

3.2. The Knowledge, Attitudes, and Perceptions of UHC in the Northwest Region of Cameroon

Only 18.4% of participants had heard of UHC, highlighting a significant gap in awareness. These results are similar to those of Silva, 2021 [19], Lenga, 2023 [20], and Adedeji *et al.*, 2023 [21]. Regarding specific statements about UHC, only 32.3% agreed that it helps reduce out-of-pocket expenditures, while 61.2% were unsure. Similarly, 20.3% believed that Cameroon aims to achieve UHC, with a large proportion (73.9%) uncertain about this goal. See Table 2. As presented in Table 5, Knowledge levels were notably low, with 43.3% of respondents classified as having poor knowledge and only 4.8% demonstrating good knowledge about UHC. In terms of attitudes, as presented in Table 6, 47.4% exhibited inappropriate attitudes towards UHC, while only 6.5% displayed a good attitude. Despite low knowledge and mixed attitudes, a majority (82.5%)

supported the idea that everyone should have access to cost-effective healthcare services. See Table 4.

Regarding preferences for medical service visits, 26.3% chose public hospitals, while 22.7% preferred private facilities. See Table 3. Most respondents believed that the government should finance UHC, with 48.1% supporting this view. These results are in line with those of Nde *et al.*, 2019 [22] and Nonla, 2024 [23]. Opinions on compulsory registration for the National Health Insurance Scheme (NHIS) were also mixed, as was realized by Akokuwebe & Idemudia, (2022) [24, 25], with 33.3% strongly supporting it and 24.9% opposing it. Despite concerns about UHC implementation, a significant willingness to participate in the NHIS emerged, with 83.0% expressing readiness to register, demonstrating a potential avenue for enhancing UHC acceptance in Cameroon. Overall, the findings reveal critical areas for improving public awareness and attitudes towards UHC, which are essential for its successful implementation.

Table 2. Knowledge of UHC.

Question	Yes n (%)	No n (%)	Don't know n (%)
Have you ever heard of UHC	77 (18.4)	341 (81.6)	/
UHC helps reduce out-of-pocket health expenditure	135 (32.3)	27 (6.5)	256 (61.2)
Does Cameroon aim to achieve UHC	85 (20.3)	24 (5.8)	309 (73.9)
With UHC, users register and pay a yearly fee as contribution	90 (21.5)	18 (4.3)	310 (74.2)
All users (patients) will contribute the same amount	81 (19.4)	65 (15.6)	272 (65)
Registration for the UHC will be voluntary	119 (28.4)	58 (13.9)	241 (57.7)
Cameroon intends to offer UHC to	Few regions n (%)	All regions n (%)	Don't know n (%)
	54 (12.9)	131 (31.4)	233 (55.7)
UHC will concern	All facilities n (%)	Private facilities (%)	Public facilities (%)
	320 (76.6)	14 (3.3)	84 (20.1)

Table 3. Summary statistics for Knowledge of Universal Health Coverage.

Questions	Number	Percentage
When you require a medical service, would you prefer to visit		
Private hospital	95	22.7
Public hospital	110	26.3
Anyone	213	51.0
Who should consult you under free UHC?		
Doctor	207	49.5
Specialist	100	23.9
Nurse	18	4.3

Questions	Number	Percentage
Anyone	93	22.3
Who should pay for UHC?		
Government	201	48.1
Users	31	7.4
Both	155	37.1
I don't know	31	7.4
Do you support the implementation of compulsory registration to the National Health Insurance Scheme (NHIS) for UHC?		
Strongly support	139	33.3
Support	154	36.8
Oppose	104	24.9
Strongly oppose	21	5.0
Your preferred revenue-collecting organization for NHIS.		
Public organization	135	32.3
Private (Independent)	56	13.4
Combination of both	148	35.4
I don't know	79	18.9
What is your preferred design for NHIS contribution rates?		
All pay same	142	34.0
Richer pay more	159	38.0
Poor shouldn't pay	58	13.9
I don't know	59	14.1

Table 4. Perception of UHC.

QUESTIONS	Yes n (%)	No n (%)	Don't know n (%)
Would you like everyone to have access to cost-effective healthcare services	345 (82.5)	23 (5.5)	50 (12.0)
Do you believe that Cameroon can provide all of its population with effective and sufficient health services	222 (53.1)	118 (28.2)	78 (18.7)
Do you believe that providing free public healthcare is a good method for achieving UHC in Cameroon	315 (75.4)	46 (11.0)	57 (13.6)
Do you believe that people should get the choice between acquiring health insurance (registering for UHC) or paying out of pocket for medical services	322 (77.1)	54 (12.9)	42 (10.0)
Will you visit the hospital more often than needed if it is free	236 (56.4)	150 (35.9)	32 (7.7)
Will you feel discriminated if you can't have access to all the services you need	261 (62.4)	111 (26.6)	46 (11.0)
Do you feel implicated in the government's decisions and designs for UHC	122 (29.2)	201 (48.1)	95 (22.7)
Are you willing to join (register) NHIS to promote UHC	347 (83.0)	31 (7.4)	40 (9.6)
Are you willing to make contributions to support healthcare for the poor Cameroonians	4.9)	59 (14.1)	46 (11.0)

Table 5. Summary statistics for the level of knowledge pertaining to UHC¹.

Knowledge	Number	Percentage (95% CI)
Poor (<25%)	181	43.3 (38.8 - 47.8)
Insufficient (25-49%)	127	30.4 (26.1 - 34.7)
Moderate (50-70%)	90	21.5 (17.7 - 25.4)
Good (>70%)	20	4.8 (2.6 - 7.2)

Table 6. Attitudes and perception towards Universal Health Coverage.

Attitude/Perception	Number	Percentage (95% CI)
Poor (<25%)	34	8.1 (5.7 - 11.0)
Inappropriate (25-49%)	198	47.4 (42.6 - 51.7)
Acceptable (50-70%)	159	38.0 (33.3 - 42.8)
Good (>70%)	27	a. (4.3 - 8.9)

3.3. Factors Associated with the Knowledge, Attitudes, and Perceptions of UHC in the Northwest Region of Cameroon

The study revealed significant variations in knowledge and attitudes toward UHC among different health districts in the Northwest Region of Cameroon. As per Table 7, Districts like Ako and Batibo had the highest mean knowledge scores, whereas Nkambe and Ndu reported the lowest, with a statistically significant difference ($p < 0.001$). For attitudes, Bali demonstrated the highest mean score, in contrast to Nkambe and Nwa, which had the lowest scores ($p < 0.001$). These variations suggest that localized health education initiatives may influence residents' understanding and perceptions of UHC. Age played a role in knowledge levels, with older respondents (61-70 years) showing lower knowledge scores (1.4 ± 0.9) compared to those aged 51-60 (2.8 ± 2.1), indicating that age may affect UHC knowledge ($p = 0.020$). However, attitudes and perceptions did not significantly differ across age groups ($p = 0.947$). Gender did not influence either knowledge or attitudes, as scores were comparable between males and females. Educational attainment had a limited effect on knowledge, while attitudes showed statistically significant differences; those with tertiary education had higher attitude scores than those with no formal education ($p = 0.014$) (see Table 7.)

Results as presented in Table 10 indicate that Profession

significantly impacted knowledge levels ($p < 0.001$), indicating that certain occupations may offer more exposure to UHC information. Access to free healthcare significantly influenced both knowledge (B coefficient = 0.139, $p = 0.004$) and attitudes (B coefficient = 0.111, $p = 0.024$). Respondents with access reported higher knowledge and more positive attitudes towards UHC, underscoring the importance of free healthcare policies. Overall, the models explained 37.2% of the variability in knowledge scores and 29.7% in attitudes/perception scores, suggesting that additional unmeasured factors may also play a crucial role in shaping public perceptions of UHC in the region.

Table 7. Factors associated with knowledge, attitude, and perception differences (1).

Variables	Knowledge		Attitudes/Perception	
	Mean $\pm$ SD	p-value	Mean $\pm$ SD	p-value
Health district				
Ako	3.6 $\pm$ 1.7		8.7 $\pm$ 1.8	
Bamenda I	2.3 $\pm$ 1.8		8.3 $\pm$ 1.9	
Bamenda III	3.2 $\pm$ 2.1		8.3 $\pm$ 2.3	
Bafut	3.6 $\pm$ 1.7		9 $\pm$ 2	
Bali	2.7 $\pm$ 1.6		10.4 $\pm$ 2.9	
Batibo	4.4 $\pm$ 1.2		8.4 $\pm$ 1.6	
Benakuma	1 $\pm$ 1		7.7 $\pm$ 2.3	
Fundong	3.2 $\pm$ 1.9		9.7 $\pm$ 1.4	
Kumbo East	1.6 $\pm$ 1.4		7.9 $\pm$ 1.7	
Kumbo West	2.8 $\pm$ 1.6	<0.001	8.6 $\pm$ 2.2	<0.001
Mbengwi	1.7 $\pm$ 0.5		6.4 $\pm$ 1.3	
Ndop	0.9 $\pm$ 0.9		7.1 $\pm$ 1.9	
Ndu	2.6 $\pm$ 1.1		8.1 $\pm$ 2.5	
Njikwa	4.2 $\pm$ 1.3		6.4 $\pm$ 2.1	
Nkambe	0.9 $\pm$ 0.8		5.1 $\pm$ 3.7	
Nwa	2.3 $\pm$ 1.2		5.7 $\pm$ 3.5	
Oku	0.7 $\pm$ 0.4		6.8 $\pm$ 0.8	
Santa	1.5 $\pm$ 0.9		7.8 $\pm$ 2.9	
Tubah	3 $\pm$ 1.9		9.6 $\pm$ 2.0	
Wum	1.9 $\pm$ 1.3		8.5 $\pm$ 2.5	
Age groups				
≤ 20	1.6 $\pm$ 1.8	0.020	7.8 $\pm$ 2.2	0.947
21 - 30	2.5 $\pm$ 1.9		7.8 $\pm$ 2.5	
31 - 40	2.3 $\pm$ 1.6		8.2 $\pm$ 2.5	

¹ Categorization of knowledge attitudes and perceptions were based on the classification by Essi, M. J., & Njoya, O. (2013), in their publication; The KAP Survey (Knowledge, Attitudes, and Practices) in Medical Research. Research Laboratory on Viral Hepatitis and Health Communication, Faculty of Medicine and Biomedical Sciences (FMSB), University of Yaoundé I.

Variables	Knowledge		Attitudes/Perception		Variables	Knowledge		Attitudes/Perception	
	Mean $\pm$ SD	p-value	Mean $\pm$ SD	p-value		Mean $\pm$ SD	p-value	Mean $\pm$ SD	p-value
41 - 50	2.3 $\pm$ 1.7		8.1 $\pm$ 2.8		Sex				
51 - 60	2.8 $\pm$ 2.1		7.9 $\pm$ 2.5		Male	2.4 $\pm$ 1.8	0.477	7.9 $\pm$ 2.6	0.573
61 - 70	1.4 $\pm$ 0.9		7.6 $\pm$ 2.1		Female	2.3 $\pm$ 1.7		8.0 $\pm$ 2.5	
71 - 80	1.9 $\pm$ 1.4		7.4 $\pm$ 3.8						
>80	0.5 $\pm$ 0.6		8 $\pm$ 1.8						

Table 8. Factors associated with knowledge, attitude, and perception differences (2).

Variables	Knowledge		Attitudes/Perception	
	Mean $\pm$ SD	p-value	Mean $\pm$ SD	p-value
Level of Education				
None	1.9 $\pm$ 1.6	0.147	6.9 $\pm$ 1.9	0.014
Primary	2.3 $\pm$ 1.6		7.9 $\pm$ 2.7	
Secondary	2.1 $\pm$ 1.8		7.7 $\pm$ 2.5	
Tertiary	2.6 $\pm$ 1.9		8.4 $\pm$ 2.5	
Profession				
Unemployed	1.9 $\pm$ 1.7	<0.001	7.4 $\pm$ 2.8	0.212
Student	2.1 $\pm$ 1.9		8.1 $\pm$ 2.5	
Self-employed	2.1 $\pm$ 1.5		8.0 $\pm$ 2.6	
Private sector	3.1 $\pm$ 1.9		7.8 $\pm$ 2.0	
Public sector	2.6 $\pm$ 1.8		8.3 $\pm$ 2.5	
Marital Status				
Single	2.3 $\pm$ 1.9	0.115	7.9 $\pm$ 2.4	0.238
Married	2.4 $\pm$ 1.7		8.0 $\pm$ 2.5	
Divorced	2.3 $\pm$ 2.2		8.8 $\pm$ 2.7	
Widow	1.5 $\pm$ 1.4		7.3 $\pm$ 3.0	
Religion				
Christian	2.3 $\pm$ 1.8	0.931	7.9 $\pm$ 2.5	0.998
Muslim	2.2 $\pm$ 1.5		7.9 $\pm$ 2.5	
Atheist	2.2 $\pm$ 2.3		8 $\pm$ 2.3	

Table 9. Variation in Knowledge and Attitudes/Perception.

Variables	Knowledge		Attitudes/Perception	
	Mean $\pm$ SD	p-value	Mean $\pm$ SD	p-value
Own an insurance scheme.				

Variables	Knowledge		Attitudes/Perception	
	Mean $\pm$ SD	p-value	Mean $\pm$ SD	p-value
Yes	2.7 $\pm$ 2.0	0.140	8 $\pm$ 2.5	0.894
No	2.2 $\pm$ 1.7		7.9 $\pm$ 2.5	
Why not				
Cannot afford	2.5 $\pm$ 1.6	0.376	8.3 $\pm$ 2.1	0.119
Unawareness	2.2 $\pm$ 1.8		7.9 $\pm$ 2.5	
Not compulsory	2.0 $\pm$ 1.6		7.3 $\pm$ 2.6	
Don't trust Insurance	2.3 $\pm$ 1.6		7.5 $\pm$ 2.4	
Don't need it	1.5 $\pm$ 2.4		5.5 $\pm$ 3.4	
Other	3.8 $\pm$ 1.9		9.8 $\pm$ 3.5	
Access to free healthcare				
Yes	2.7 $\pm$ 1.9	<0.001	8.6 $\pm$ 2.3	0.003
No	2.1 $\pm$ 1.7		7.7 $\pm$ 2.5	

Table 10. Multiple linear regression.

Variables	Knowledge		Attitude/Perception	
	B coefficient	p-value	B coefficient	p-value
Health district	0.224	<0.001	0.155	0.002
Age groups	0.028	0.580	NA	NA
Level of education	0.009	0.862	0.073	0.127
Profession	0.170	<0.001	NA	NA
Access to free healthcare	0.139	0.004	0.111	0.024
R ²	0.372		0.297	

3.4. Preferences and Predictors of UHC Choices: Provider, Financing, and Payment Schemes

Regarding UHC plan choices, 51.0% had no preference for private or public hospitals, 26.3% preferred public hospitals, 48.1% believed the government should cover all UHC costs, and 37.1% supported joint government-individual payments. Most (70%) supported a compulsory NHIS. Mixed institutions were preferred as revenue collectors, with 38.0% favoring higher contributions from the rich. The study examined respondents' preferences for UHC in relation to their awareness of UHC and their engagement with health insurance. Awareness played a pivotal role in shaping preferences, with 83.1% of respondents familiar with UHC expressing a

preference for insurance options compared to 75.7% of those unaware. Table 11. However, the statistical significance of this association was not established. Among those aware of UHC, individuals who preferred not to select insurance had a lower odds ratio of 0.626, suggesting less inclination toward insurance choice. Awareness did not significantly influence feelings of discrimination related to access to healthcare (odds ratio 1.065, $p = 0.810$). Furthermore, respondents with UHC awareness showed distinct preferences for insurance models, notably favoring designs where wealthier individuals contribute more (odds ratio 2.297, $p = 0.001$). Conversely, those preferring equal contributions had a lower odds ratio (0.630, $p = 0.101$). Willingness to financially support the poor in accessing healthcare was significantly higher among those aware of UHC, with an odds ratio of 4.033 ($p < 0.001$).

Table 11. Factors Influencing Attitudes and Preferences Regarding Universal Health Coverage.

Variable	Ever heard of UHC		Odds ratio (95% CI)	p-value
	Yes	No		
UHC vs Out-of-Pocket: Should People Have a Choice?				
Yes	64 (83.1)	258 (75.7)	1.584 (0.831 - 3.020)	0.160
No	7 (9.1)	47 (13.8)	0.626 (0.271 - 1.443)	0.268
Don't know	6 (7.8)	36 (10.5)	0.716 (0.290 - 1.765)	0.466
Would You Feel Discriminated If You Can't Access All the Health Services You Need				
Yes	49 (63.6)	212 (62.2)	1.065 (0.637 - 1.779)	0.810
No	19 (24.7)	92 (27.0)	0.887 (0.501 - 1.569)	0.679
Don't know	9 (11.7)	37 (10.8)	1.087 (0.501 - 2.359)	0.832
Preferred NHIS contribution rates				
Everyone pays same	20 (26.0)	122 (35.8)	0.630 (0.361 - 1.098)	0.101
Richer pay more	42 (54.5)	117 (34.3)	2.297 (1.392 - 3.792)	0.001
Poor shouldn't pay	10 (13.0)	48 (14.1)	0.911 (0.439 - 1.893)	0.803
Don't know	5 (6.5)	54 (15.8)	0.369 (0.142 - 0.956)	0.033
Willingness to join NHIS to promote UHC				
Yes	63 (81.8)	284 (83.3)	0.903 (0.474 - 1.722)	0.757
No	5 (6.5)	26 (7.6)	0.841 (0.312 - 2.266)	0.732
Don't know	9 (11.7)	31 (9.1)	1.324 (0.602 - 2.908)	0.484
Willingness to pay for healthcare for the poor				
Yes	70 (90.9)	243 (71.3)	4.033 (1.791 - 9.080)	<0.001
No	3 (3.9)	56 (16.4)	0.206 (0.063 - 0.678)	0.004
Don't know	4 (5.2)	42 (12.3)	0.390 (0.136 - 1.123)	0.071

Table 12. Factors Influencing Attitudes and Preferences Regarding UHC in Relation to Ownership of Insurance.

Variable	Own any form of Insurance		Odds ratio (95% CI)	p-value
	Yes n (%)	No n (%)		
Who Should Pay for UHC				
Government	23 (43.4)	178 (48.8)	0.805 (0.451 - 1.440)	0.465
Users	6 (11.3)	25 (6.8)	1.736 (0.677 - 4.452)	0.259
Both	16 (30.2)	139 (38.1)	0.703 (0.377 - 1.311)	0.266
Don't know	8 (15.1)	23 (6.3)	2.643 (1.116 - 6.262)	0.043
Support for Compulsory Payment of NHIS for UHC:				
Strongly support	31 (58.5)	108 (29.6)	3.353 (1.857 - 6.054)	<0.001
Support	13 (24.5)	141 (38.6)	0.516 (0.267 - 0.999)	0.047

Variable	Own any form of Insurance		Odds ratio (95% CI)	p-value
	Yes n (%)	No n (%)		
Oppose	8 (15.1)	96 (26.3)	0.498 (0.227 - 1.095)	0.078
Strongly oppose	1 (1.9)	20 (5.5)	0.332 (0.044 - 2.524)	0.497
Preferred Design for Payment:				
Everyone pays same	8 (15.1)	134 (36.7)	0.306 (0.140 - 0.670)	0.002
Richer pay more	33 (62.3)	126 (34.5)	3.130 (1.725 - 5.679)	<0.001
Poor shouldn't pay	9 (17.0)	49 (13.4)	1.319 (0.606 - 2.871)	0.484
Don't know	3 (5.7)	56 (15.3)	0.331 (0.100 - 1.098)	0.059
Willingness to Join NHIS to Promote UHC:				
Yes	49 (92.5)	298 (81.6)	2.754 (0.961 - 7.895)	0.050
No	2 (3.8)	29 (7.9)	0.454 (0.105 - 1.962)	0.403
Don't know	2 (3.8)	38 (10.4)	0.337 (0.079 - 1.442)	0.125

Insurance ownership also influenced preferences and support for UHC financing. Table 12 indicates that among those with insurance, 43.4% believed the government should finance UHC, similar to 48.8% of those without insurance (odds ratio 0.805, $p = 0.465$). Respondents with insurance were significantly more likely to support compulsory National Health Insurance Scheme (NHIS) payments for UHC (odds ratio 3.353, $p < 0.001$) and showed a preference for payment designs where wealthier individuals pay more (odds ratio 3.130, $p < 0.001$). Although a higher percentage of insured respondents (92.5%) were willing to join NHIS, the difference was not statistically significant (odds ratio 2.754, $p = 0.050$). Overall, the study underscores the complex interplay between awareness, insurance ownership, and preferences for UHC in shaping attitudes toward health financing.

4. Discussion

This study on Universal Health Coverage in the Northwest Region of Cameroon reveals critical insights into public awareness, attitudes, and preferences regarding healthcare access. Notably, only 18.4% of participants had heard of UHC, indicating a significant gap in awareness. Despite low knowledge levels—43.3% classified as having poor knowledge—there is strong support for the principle of UHC, with 82.5% advocating for universal access to cost-effective healthcare services [26, 27]. The findings highlight the necessity for targeted health education initiatives, particularly in districts with lower knowledge scores, as demonstrated by significant variations in understanding and attitudes across regions. Age and occupation were influential factors, with older individuals displaying lower knowledge levels, while access to free healthcare correlated with improved under-

standing and positive attitudes; this was similar to the findings of Nde, 2019 in Cameroon [22]. Preferences for UHC financing revealed that nearly half of respondents believed the government should cover all costs, with 70% supporting compulsory registration for the National Health Insurance Scheme (NHIS). This was similar to the findings of Ako-kuwebe [25] and Elnade [28]. Additionally, awareness of UHC, as studied by Ahmad in Nigeria [29], positively correlated with preferences for insurance models that require wealthier individuals to contribute more, indicating recognition of equity in healthcare financing. Overall, the study highlights the need for comprehensive strategies to enhance public knowledge and foster positive attitudes toward UHC, which is essential for its successful implementation in Cameroon.

The study presents several strengths, including a comprehensive assessment of knowledge, attitudes, and perceptions of UHC among a diverse sample in the Northwest Region of Cameroon. The inclusion of various socio-demographic factors (age, gender, education, and occupation) enhances the understanding of how these variables influence UHC awareness and preferences. The use of odds ratios to analyze associations between awareness and attitudes provides a quantitative basis for interpreting results, adding rigor to the findings. However, there are limitations to consider. The low overall awareness of UHC (18.4%) suggests that results may not be generalizable to broader populations. The cross-sectional design limits the ability to establish causal relationships between variables. Additionally, the reliance on self-reported data may introduce bias, as participants might provide socially desirable responses regarding their attitudes toward healthcare financing. Furthermore, the study's findings could be influenced by external factors not measured, such as socio-economic status or access

to healthcare services. Finally, the relatively low percentage of respondents with prior health insurance (12.7%) may impact the validity of conclusions drawn regarding insurance ownership and preferences for UHC financing. These factors should be acknowledged when interpreting the study's implications for UHC implementation in Cameroon.

This study on UHC in the Northwest Region of Cameroon reveals critical insights into public awareness, attitudes, and preferences regarding healthcare access, aligning with existing research and policies. Notably, the finding that only 18.4% of participants had heard of UHC reflects a substantial gap in awareness, corroborating earlier studies indicating low public knowledge of UHC in similar contexts [30, 31]. The fact that 43.3% were classified as having poor knowledge further emphasizes this issue, consistent with findings from other regions where low awareness impeded UHC implementation [32]. Despite these low knowledge levels, 82.5% of participants expressed support for UHC, highlighting a discrepancy between awareness and advocacy, which aligns with previous findings that demonstrated strong public backing for UHC principles despite limited understanding [33]. The influence of demographic factors, particularly age and occupation, aligns with literature suggesting that older individuals often have less exposure to health policies [34]. Furthermore, preferences for UHC financing—where nearly half believed the government should cover all costs—echo the findings of other studies advocating for equitable financing structures [35]. The positive correlation between awareness of UHC and support for equitable insurance models underscores the need for educational initiatives to enhance public understanding, which is essential for effective UHC implementation in Cameroon. This study contributes to the literature by highlighting significant gaps in public awareness and knowledge of UHC in the Northwest Region of Cameroon. It emphasizes the need for targeted health education initiatives and reveals strong public support for UHC, particularly regarding equitable financing and access to healthcare.

The findings provide valuable insights that can be generalized and transferred to similar low-resource settings with comparable healthcare challenges. The low levels of public awareness and knowledge of UHC, alongside the strong support for universal access, are likely to resonate in other regions of Cameroon and similar contexts across Sub-Saharan Africa. Health education initiatives aimed at enhancing understanding and promoting positive attitudes toward UHC can be adapted to address the unique needs of different populations, making these approaches transferable to other districts with low knowledge scores. Moreover, the methods employed in this study, including quantitative surveys and stratified sampling based on demographics, can be generalized for assessing public perceptions and attitudes towards UHC in other regions. This methodological framework can be useful for researchers and policymakers aiming to identify gaps in awareness and to develop targeted interventions in diverse healthcare contexts. Additionally, the identified correlations

between socio-demographic factors, such as age and occupation, and knowledge levels provide a basis for tailored educational strategies that can be applied broadly to improve healthcare accessibility and equity in similar environments.

This study carries significant implications for policy and practice. Policymakers should prioritize targeted health education initiatives to enhance public awareness and understanding of UHC, especially in regions exhibiting lower knowledge levels. The high level of support for UHC principles stresses the need for comprehensive policies that align with public views, advocating for universal access to cost-effective healthcare services. Engaging communities through education can foster a positive environment for implementing UHC strategies, thereby increasing public buy-in. The study also reveals a willingness among respondents to co-finance UHC through compulsory participation in the National Health Insurance Scheme (NHIS), with a vast majority supporting the model where wealthier individuals contribute more. This finding highlights the potential for equitable financing mechanisms that can gather public support, ensuring sustainability. For further research, future studies should explore the barriers to implementing UHC, including financial, logistical, and infrastructural challenges, to inform evidence-based interventions. Researchers should also investigate the effectiveness of various educational approaches in enhancing knowledge and attitudes toward UHC. By nurturing collaboration between researchers and policymakers, future interventions can be designed to effectively address the identified gaps and ensure a successful rollout of UHC initiatives across similar contexts.

Abbreviations

UHC	Universal Health Coverage
SPSS	Statistical Package for Social Sciences
ANOVA	Analysis of Variance
CERSH	Regional Ethical Committee for Human Health Research
NHIS	National Health Insurance Scheme
SDG	Sustainable Development Goals
SD	Standard Deviation

Author Contributions

Therence Nwana Dingana: Conceptualization, Data curation, Investigation, Project administration, Writing – original draft

Longla Terence Achelieu: Investigation, Methodology, Resources, Validation

Leo Cedric Fosso Fozou: Data curation, Formal Analysis, Methodology

Stewart Ndutard Ngasa: Software, Supervision, Validation, Visualization, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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