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Comorbidity and Spousal Concordance of Hypertension and Diabetes Among Couples in Nigeria: Findings From the 2023 – 2024 Nigeria Demographic and Health Survey

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Abstract

Background

The rise in the prevalence of hypertension and diabetes in Nigeria, coupled with the risk of the two conditions coexisting in an individual, poses major challenges to achieving Sustainable Development Goal 3. This requires re-strategising prevention and care through more integrated, equitable, and targeted approaches.

Objectives

This study aimed to evaluate gaps in the prevention and care of hypertension and diabetes among couples, and to assess comorbidity, spousal concordance, and factors associated with these conditions.

Methods

A secondary analysis of 6,828 couples from the 2024 Nigeria Demographic and Health Survey was conducted using survey-weighted proportions and multivariable logistic regression. Survey-weighted means and adjusted Wald tests were used to assess within-couple differences, and a design-based Pearson chi-square test was used to assess spousal association in disease status.

Results

Blood pressure screening is higher among wives than husbands (62.8% vs 41.3%). Husbands (17.0%; 95% CI: 15.3, 18.9) reported a hypertension diagnosis more than wives (13.1%; 95% CI: 11.8, 14.5), despite wives having higher screening coverage, while reporting diabetes diagnosis differs within couples by 5.3% points (95% CI: -7.7, -2.1; p-value < 0.001). There are noteworthy differences in the care cascade of diabetes and hypertension, and the prevalence of comorbidity is more than two times higher among husbands than wives (3.4% vs 1.3%). Spousal concordance is 3.8% (95% CI: 2.9, 4.9) for reported hypertension diagnosis; husbands whose wives reported a hypertension diagnosis have 83% higher odds of reporting a diagnosis (OR: 1.83; 1.32, 2.55). The odds of hypertension and diabetes increase with age among wives and husbands.

Conclusion

There is a notable difference in the hypertension and diabetes care cascade and comorbidity among couples, emphasising the necessity for an integrated, couple-focused approach to the prevention and care in Nigeria.

Background

The prevalence of hypertension and diabetes in Nigeria is alarmingly increasing, with one in three Nigerian adults affected by hypertension (34.2%; 95% CI: 29.6, 39.1%) [1] and diabetes nearly doubling modelled estimates (7.0%; 95% CI: 5.0–9.0%) [2]. However, the burden of these conditions is not limited to disease prevalence; additional concerns are undiagnosed individuals and a lack of continuity of care. There are substantial gaps in hypertension and diabetes screening, diagnosis, treatment and control, with losses occurring at multiple points along the care cascade [3,4]. These gaps could be attributed to patient-level constraints such as socioeconomic status, lifestyle factors, misconceptions, and low health literacy, as well as system deficiencies such as limited Primary Health Care (PHC) capacity, inadequate resources, and a fragmented health system [4].

The current morbidity and mortality rates of noncommunicable diseases (NCDs) in Low- and Middle-Income Countries (LMICs) indicate that achieving Sustainable Development Goals (SDG) 3 and 4, which target a one-third reduction in premature NCD mortality by 2030, is out of reach. To fast-track reductions in NCD mortality, a focus on NCD care cascades will draw policy attention to the provision of accessible, affordable, and standardised care at PHC [5]. Evaluating the care cascade provides deeper insight into the burden of disease. The gaps in the care cascade are notably worrisome due to the coexistence of hypertension and diabetes often seen in individuals, thereby increasing the complexity of the prevention and management of NCDs. This vicious alliance could result in numerous complications, including renal and cardiac diseases [6,7,8], underscoring the importance of integrated management of individuals with comorbidity.

Beyond individual-level comorbidity, spouses share common social, environmental, and behavioural risks which may contribute to similar health profiles, resulting in potential spousal concordance in NCDs. Spousal concordance studies identify shared risk factors within couples, highlighting the call to shift from targeted interventions at the individual and community levels to couple-focused approaches [9]. Couple-focused interventions may promote the integration of hypertension and diabetes prevention and care within existing health programmes, including concurrent spousal screening and shared lifestyle and behavioural modification to promote wellbeing.

There is limited evidence on the interconnection of hypertension and diabetes as substantial health challenges, particularly within households, in Nigeria. Existing evidence is largely focused on disease burden and the care cascade as separate contexts [1,2,3,10,11,12,13,14], paying less attention to the coexistence of hypertension and diabetes and to the extent to which these conditions are concordant between spouses. Integrating these scopes provides a nuanced understanding of the conditions and offers an opportunity to identify actionable evidence for the prevention and care of hypertension and diabetes using couple-informed approaches.

Using nationally representative survey data from the Nigeria Demographic and Health Survey (NDHS), this study aimed to assess the care cascade for hypertension and diabetes among couples in Nigeria, estimate hypertension-diabetes comorbidity and spousal concordance of these conditions, and identify

factors associated with these conditions in the population. This will help identify potential gaps in NCD care and prevention and inform policy to achieve SDG 3 targets for NCD prevention and mortality reduction, as well as universal health coverage in Nigeria.

Methods

Study Design

This study is a survey-weighted secondary analysis of the couple's dataset from the 2023–2024 NDHS conducted by the Nigeria National Population Commission. A stratified two-stage sample design was employed to obtain representative estimates for the 36 states and the Federal Capital Territory, the 6 geopolitical zones, and the country at large for the 2024 NDHS. This study did not conduct any participant recruitment, sample selection, or follow-up. The NDHS has provided information on participant selection, eligibility criteria and data collection procedures [15].

The study design, analysis population, variable definitions, and statistical analyses were transparently reported in accordance with Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies. The selection of the analytic sample, handling of missing observations, and the limitations of the study design were reported accordingly.

Study population and sample size

This study analysed data from 6,828 couples, wives aged 15–49 years and husbands aged 19–59 years, who were assessed for blood pressure and blood sugar indicators. To ensure consistency and reduce misclassification in the care cascade analysis, the 10 wives and 44 husbands who reported "don't know" for hypertension screening, and the 53 wives and 70 husbands who reported "don't know" for diabetes screening, were treated as missing responses. This makes the total analytic sample size 6,818 wives and 6,784 husbands for hypertension screening and 6,775 wives and 6,758 husbands for diabetes screening. Diagnosis was assessed only among respondents who reported having previously measured blood pressure or blood glucose. The 58 wives and 57 husbands who had reported a diagnosis of hypertension, and the 20 wives and 33 husbands who had reported a diagnosis of diabetes, but responded "no" to the question of ever being screened by a health worker for blood pressure or blood sugar, were excluded from the analytic sample. Also, 10 wives and 12 husbands who reported taking medication for hypertension and 2 wives and 5 husbands who reported taking medication for diabetes, with "no" as a response to prescribed medication for hypertension or diabetes, were also removed from the analytic sample (Fig. 1).

Variable definitions

Outcome variables

The outcome variables were derived from the self-reported blood pressure/hypertension and blood glucose/diabetes indicators:

Blood pressure

ever had blood pressure screened by a health worker, self-reported high blood pressure/hypertension diagnosis, prescribed medication to control high blood pressure, and taking medication to control blood pressure

Blood glucose

ever screened by a health worker for blood sugar, self-reported high blood sugar/diabetes diagnosis, prescribed medication to control high blood sugar, and taking medication to control blood sugar.

NDHS did not conduct clinical assessments of participants to validate their self-reported diagnoses and the effectiveness of treatments in controlling these diseases. The care cascade was therefore assessed based on only these four stages. The cascade was strictly nested; diagnosis was assessed among those screened, prescription was assessed among those diagnosed through screening, and current medication use was assessed among those prescribed medication.

The comorbidity of hypertension and diabetes was assessed using four mutually exclusive categories derived from self-reported diagnoses of hypertension and diabetes: “Neither hypertension nor diabetes”, “Hypertension only”, “Diabetes only”, and “Both hypertension and diabetes”. Spousal concordance for the care cascade was assessed from a constructed concordance variable with four categories: “Neither wife nor husband”, “Wife only”, “Husband only”, and “Both wife and husband”. The factors associated with wife or husband reporting hypertension and diabetes were assessed using the self-reported diagnosis of hypertension and diabetes as outcome variables. Factors associated with spousal self-reported hypertension and diabetes diagnosis were examined by constructing two outcomes: “Neither spouse” and “at least one spouse”. A couple is classified as having at least one spouse with the condition if either spouse reported a diagnosis, and as having neither spouse with the condition if both spouses were screened and neither reported a diagnosis.

Explanatory variables

All potential candidate variables were selected based on their epidemiological relevance, prior evidence [2,12,16,17], statistical significance, and availability in the couples’ dataset. These include:

Spouse characteristics: wife/husband age, wife/husband education, wife/husband alcohol consumption, wife/husband work status, wife's Body Mass Index (BMI), and wife/husband parity.

Couple characteristics

household wealth index, geographical zone, and place of residence.

Wife and husband parity were categorised into “0”, “1–2”, “3–4”, and “5 or more children” to identify how risk differs within the group. Wife's BMI was derived from the DHS BMI variable (v445) by dividing the values by 100. BMI was measured for 6719 women, of whom 5 were flagged. The flagged observations were treated as missing and removed from the total number of observations. Work status was also recategorised into two categories by recoding "not working and didn't work in the last 12 months" as "not working" and the remaining categories as "working" to reduce data sparsity across the initial categories. Alcohol consumption categories were constructed from variables mv485a and v485a (numbers of days respondents drank alcohol in the past month) for husbands and wives, respectively. These variables were categorised into three: “Never” for the response “never have consumed alcohol”, “Occasionally” for the response “did not have even one drink and 1–14 days”, and “Frequently” for “every day/almost every day and 15–31 days”.

Data Management and Statistical Analysis

Data were properly checked for consistency between linked wife and husband records. Across partner household-level records, residence, geographical zone, and wealth index were assessed for consistency before inclusion in the analyses. All analyses were conducted using StataNow 19.5 Standard Edition and accounted for the complex multistage survey design using the primary sampling unit (mv021), sampling stratum (mv022) and men’s individual sampling weight (mv005). Based on the DHS recommendation, mv005 was used as the sampling weight for the couples recode dataset [18] to enable pairing of required information from wives and husbands.

Survey-weighted percentages and 95% Confidence Intervals (CIs) were used to describe the care cascade for hypertension and diabetes, the hypertension-diabetes comorbidity, and spousal concordance. Age was described using the survey-weighted mean and 95% CI. A sex-specific and a paired within-couple analysis was conducted separately for the care cascades of the two conditions. In the sex-specific analysis, the survey-weighted proportion of the care cascade, with 95% CI, was estimated separately for wives and husbands using the available observations for each sex. A paired within-couple analysis was conducted for observations measured for both spouses. No couple had both spouses diagnosed with diabetes, so the paired comparison could only be done for hypertension and for the screening and diagnosis steps of diabetes.

The paired within-couple analysis estimated the average difference within couples for each indicator by subtracting the husband’s status from the wife’s status, and the results were reported as a survey-weighted mean with a 95% CI. A design-based adjusted Wald F-test was used to assess whether the within-couple mean difference differed significantly from zero. Pearson chi-square test with Rao-Scott correction was used to assess association between wives' and husbands' reported diagnoses. The strength of association was quantified with an Odds Ratio (OR) estimated from survey-weighted logistic regression. Factors associated with self-reported hypertension and diabetes diagnosis among wives, husbands, and couples were also assessed using an adjusted survey-weighted logistic regression. Statistical significance was set at $p < 0.05$.

Univariate analyses were performed using survey-weighted logistic regression models for each candidate explanatory variable. Those variables considered epidemiologically relevant were then included in the multivariable models. Adjusted odds ratios (aORs), 95% CI, and *p* values were reported accordingly. Before building the multivariable model, multicollinearity among the potential explanatory variables was assessed using Pearson correlation coefficients for continuous variables. Variance Inflation Factors were also estimated using an ordinary linear regression model as a diagnostic method, yielding average Variance Inflation Factors of 2.75, 2.88, 3.77, 3.57, 3.08, and 4.39 for the six models, respectively, indicating less evidence of collinearity among the explanatory variables.

Sensitivity analysis

Wife's parity has a high Variance Inflation Factor across the models; the models were estimated with and without it to assess the differences in the estimates. However, the model estimates were similar across most covariates, supporting the retention of parity in the primary models.

Results

Healthcare cascade of hypertension and diabetes among wives and husbands

The sex-specific analysis shows that blood pressure screening is higher among wives (62.8%; 95% CI: 60.8, 64.8) than among husbands (41.3%; 95% CI: 39.5, 43.2), while blood sugar screening is similar for both wives and husbands. Husbands (17.0%; 95% CI: 15.3, 18.9) reported a hypertension diagnosis more than wives (13.1%; 95% CI: 11.8, 14.5). Self-reported diabetes diagnosis is more than two times higher among husbands (6.6%; 95% CI: 5.3, 8.3) than wives (2.6%; 95% CI: 5.3, 8.3). Medication prescription is similar among wives and husbands for hypertension and diabetes, while medication usage is higher among husbands for hypertension and higher among wives for diabetes (Figs. 2 and 3). The paired within-couple analysis shows that, on average, blood pressure screening is 21.6% points (95% CI: 19.4, 23.9; $p < 0.001$) higher among wives than husbands, while blood sugar screening is 1.2% points (95% CI: -2.8, 0.4; $p = 0.148$) lower among wives compared to husbands. Self-reported hypertension diagnosis is 2.8% points (95% CI: -5.4, -0.2; $p = 0.033$) lower among wives than husbands, despite wives having higher screening coverage than husbands, while self-reported diabetes is 5.3% points (95% CI: -7.7, -2.-1; $p < 0.001$) lower among wives than husbands. The proportion of wives prescribed medication for hypertension is 13.8% points (95% CI: -28.2, 5.6, $p = 0.059$) lower than that of husbands and medication usage for hypertension is 8.3% points (95% CI: -31.5, 14.9; $p = 0.484$) lower among wives than husbands. The paired within-couple differences for diabetes medication prescription and usage could not be estimated because no couple in the data set has both spouses diagnosed with diabetes.

Comorbidity of hypertension and diabetes among couples

Among couples who were screened for both conditions, the comorbidity of self-reported hypertension and diabetes is more than two times higher among husbands (3.4%; 95% CI: 2.5, 4.5) than wives (1.3%; 95% CI: 0.8, 2.2), with a difference in the distribution between wives and husbands (Design-based F (2.99, 3779.84) = 6.4686; p < 0.001). “Hypertension only” was reported similarly for both wives and husbands, while “diabetes only” was reported more among husbands compared to wives (Table 1). The survey-weighted mean age of wives with hypertension-diabetes comorbidity is 39.7 years (95% CI: 36.5, 42.9), and 45.0 years (95% CI: 42.2, 47.8) for husbands. There is no clear gradient by education level and wealth index; comorbidity estimates were nearly identical across the poorest and richest wealth index categories. Among wives and husbands, urban residents have a higher prevalence of comorbidity than rural residents (Table 2).

Table 1
Hypertension-diabetes comorbidity among wives and husbands

Comorbidity status	**Wives (n = 1,555) % (95% CI)**	**Husbands (n = 1,562) % (95% CI)**	**Pearson χ^2**	**p-value**
Neither	84.7(82.5, 86.7)	80.6(78.0, 82.9)	6.4686	< 0.001
Hypertension only	12.6(10.8, 14.7)	13.0(11.1, 15.3)		
Diabetes only	1.3(0.8, 2.0)	3.1(2.1, 4.4)		
Both	1.3(0.8, 2.2)	3.4(2.5, 4.5)		

Note: Percentages and 95% Confidence Intervals (CI) are survey-weighted. n (comorbidity samples) is an unweighted count of respondents who reported screening for both hypertension and diabetes (“don’t know” excluded). The p-value is obtained from a Pearson chi-square test with Rao-Scott design correction. Percentages describe the proportion of the groups that were screened for both conditions and not population prevalence. Neither indicates no reported diagnosis of either condition, while both indicates reported diagnoses of both conditions.

Spousal concordance in hypertension and diabetes care cascade

Close to one-third of couples have been screened for blood pressure (31.1%; 95% CI: 29.4, 32.8), compared with 26.7% of couples who have not been screened (95% CI: 24.9, 28.6). More than half of the couples (63.4%; 95% CI: 61.8, 64.9) have not been screened for blood sugar, while only 9.7% (95% CI: 8.9, 10.7) have been screened for blood sugar, reflecting a differential screening behaviour for the two conditions. There was concordance in self-reported hypertension for both spouses in 3.8% of couples (95% CI: 2.9, 4.9), while there was no concordance in self-reported diabetes diagnosis (Table 3). The proportion of husbands who reported hypertension is higher among couples in which the wife also reported hypertension than among couples in which the wife did not report hypertension (25.8% vs 15.9%). Self-reported hypertension diagnoses were significantly associated among spouses (Design-based F (1, 1272) = 13.37, $p < 0.001$). The odds of a husband being diagnosed were 83% higher when the wife was diagnosed than when the wife was not. Among couples in which the wife reported diabetes, no

husband reported diabetes, compared to couples in which the wife did not report diabetes (Table 4). Among couples who were screened for both conditions, 4.5% (95% CI: 2.8, 7.2) of husbands whose wives had neither condition had hypertension and diabetes comorbidity. Among wives with hypertension only, 16.1% (95% CI: 9.7, 25.4) of husbands also had hypertension only. There is no spousal concordance of hypertension-diabetes comorbidity (Table 5).

Table 2
Comorbidity distribution by sociodemographic characteristics

Variables		Wives (n = 1555)	Husbands (n = 1562)
	Categories	**% (95% CI)**	**% (95% CI)**
Education level	No education	1.0(0.1, 6.9)	3.5(1.3, 8.9)
	Primary	1.7(0.6, 4.6)	1.5(0.5, 4.1)
	Secondary	1.3(0.5, 3.1)	3.0(1.8, 5.0)
	Higher	1.4(0.6, 3.1)	4.2(2.7, 6.4)
Marital status	Married	1.4(0.8, 2.4)	3.4(2.5, 4.6)
	Living with a partner	0	0
Occupation	Not working	0.7(0.2, 2.4)	0
	Working	1.4(0.8, 2.5)	3.4(2.5, 4.6)
Residence	Urban	1.7(0.9, 3.1)	3.8(2.6, 5.4)
	Rural	0.7(0.3, 1.5)	2.7(1.5, 4.5)
Wealth index	Poorest	1.9(0.5, 7.8)	3.7(0.6, 18.9)
	Poorer	1.8(0.3, 11.9)	2.6(0.9, 6.8)
	Middle	0.4(0.0, 1.6)	2.7(1.4, 5.3)
	Richer	0.8(0.3, 2.5)	2.5(1.3, 4.6)
	Richest	1.7(0.9, 3.5)	4.3(2.7, 6.6)
Region	North west	0.8(0.1, 5.2)	3.6(1.9, 6.4)
	North east	5.6(1.8, 15.7)	1.4(0.3, 5.5)
	North central	2.3(1.2, 4.6)	3.0(1.5, 5.8)
	South east	0.6(0.1, 2.3)	1.1(0.4, 2.9)
	South south	0.4(0.1, 1.3)	4.5(2.6, 7.6)
	South west	0.7(0.2, 2.7)	5.1(2.5, 10.2)

Note: Row percentages of comorbid within each category and 95% CIs are survey-weighted. n = comorbidity sample: respondents who were screened for both conditions. Percentages are for comorbidity within the comorbidity samples, not population prevalence.

Table 3
Spousal concordance in hypertension and diabetes care cascade

Indicator	Neither % (95% CI)[1]	Wife only % (95% CI)[1]	Husband only % (95% CI)[1]	Both spouse % (95% CI)[1]
Blood pressure checked by a health worker (n = 6774)	26.7 (24.9, 28.6)	31.9 (30.3, 33.6)	10.3 (9.3, 11.3)	31.1 (29.4, 32.8)
Self-reported hypertension diagnosis (n = 2149)	71.8 (69.4, 74.1)	10.8 (9.3, 12.5)	13.6 (11.9, 15.5)	3.8 (2.9, 4.9)
Prescribed medication for hypertension (n = 80)	6.4 (2.3, 16.6)	11.3 (5.4, 22.3)	25.1 (16.5, 36.4)	57.2 (45.3, 68.3)
Taking medication to control blood pressure (n = 46)	15.0 (5.6, 34.6)	14.5 (5.3, 33.9)	22.8 (11.1, 41.2)	47.6 (31.5, 64.3)
Blood sugar checked by a health worker (n = 6706)	63.4 (61.8, 64.9)	12.8 (11.9, 13.9)	14.0 (12.9, 15.2)	9.7 (8.9, 10.7)
Self-reported diabetes diagnosis (n = 698)	91.3 (88.6, 93.4)	1.7 (0.9, 3.2)	7.0 (5.2, 9.5)	0
Prescribed medication for diabetes	-	-	-	-
Taking medication to control blood sugar	-	-	-	-

Note: n is a paired, nested sample of couples. Each step includes only couples in which both spouses completed the previous step: diagnosis among couples in which both spouses were screened, prescription among couples in which both were diagnosed, and current medication use among couples in which both were prescribed. Percentages with 95% CI are survey-weighted. Prescribed medication and taking medication could not be estimated for diabetes, because no couple had both spouses diagnosed.

Table 4
Association between wives' and husbands' reported diagnoses

Wife's self-reported diagnosis		Husband's self-reported diagnosis		Pearson χ^2	*p* value	Odds Ratio
		No	Yes			
		% (95% CI)	% (95% CI)			
Hypertension	No (%)	84.1	15.9	13.37	< 0.001	1.83
		(81.9, 86.0)	(13.9, 18.1)			(1.32, 2.55)
	Yes (%)	74.2	25.8			
		(67.9, 79.6)	(20.4, 32.1)			
Diabetes	No (%)	92.9	7.1	-	-	-
		(90.4, 94.8)	(5.3, 9.6)			
	Yes (%)	100	0			

Note: Percentages with 95% CI are survey-weighted estimates; *p-value* from Pearson chi-square test with Rao-Scott design correction. Odds Ratio was derived from survey-weighted logistic regression; reference category: “wife not diagnosed”. Association test was not done for diabetes because no couple has both spouses diagnosed.

Table 5
Spousal concordance of hypertension and diabetes comorbidity

Wife's comorbidity status	**Husband's comorbidity status**			
	Neither	**Hypertension only**	**Diabetes only**	**Both**
	% (95% CI)	**% (95% CI)**	**% (95% CI)**	**% (95% CI)**
Neither	81.1	12.1	2.3	4.5
% (95% CI)	(77.1, 84.4)	(9.5, 15.3)	(1.3, 4.2)	(2.8, 7.2)
Hypertension only	78.1	16.1	4.0	1.8
% (95% CI)	(68.1, 85.6)	(9.7, 25.4)	(1.4, 10.7)	(0.4, 7.0)
Diabetes only	79.5	20.5	0	0
% (95% CI)	(39.1, 95.9)	(4.1, 60.9)		
Both	100.0	0	0	0
% (95% CI)				

Note: Row percentages of comorbid within each category and 95% CIs are survey-weighted. n = 644 paired couples in which both spouses were screened for both conditions. Percentages with 95% CIs are weighted. Neither indicates not having any of the conditions, while both indicates having hypertension and diabetes.

Factors associated with self-reported hypertension among wives and husbands

In the adjusted multivariable model, every increase in the year of age of the wives significantly increases the odds of reporting hypertension among wives by 4% (aOR: 1.04; 95% CI: 1.01, 1.06; $p = 0.003$), and a unit increase in wives' BMI increases the odds of hypertension by 7% (aOR: 1.07; 95% CI: 1.05, 1.10; $p < 0.001$). The odds of reporting hypertension among husbands also increase with husband's age (aOR: 1.05 per year; 95% CI: 1.03, 1.08). Wives in the middle wealth index have significantly higher odds compared with those in the poorest wealth index, holding other variables constant. The odds of self-reported diagnosis among wives also vary by region; wives and husbands from the Southwest have 71% and 49%, respectively, lower odds of reporting hypertension compared to those in the Northwest region, conditioning on other variables. Also, the odds of reporting a diagnosis increase significantly by 54% among wives who are occasional alcohol drinkers. Husbands who drink alcohol occasionally or frequently have significantly higher odds compared to non-drinkers. Residence, husband/wife work status, husband/wife parity and husband/wife education are not significantly associated with reporting hypertension among wives and husbands (Table 6).

Table 6
Survey-weighted multivariable logistic regression of factors associated with self-reported hypertension diagnosis among wives and husbands

Characteristic	Wives		Husbands	
	Adjusted OR (95% CI)	**p-value**	**Adjusted OR (95% CI)**	**p-value**
Wife's age (years)	**1.04 [1.01, 1.06]**	**0.003**	1.01 [0.98, 1.03]	0.512
Husband's age (years)	1.01 [0.99, 1.03]	0.339	**1.05 [1.03, 1.08]**	**< 0.001**
Wife's education				
No education (ref)	1.00		1.00	
Primary	0.88 [0.59, 1.33]	0.544	1.15 [0.72, 1.83]	0.558
Secondary	0.79 [0.53, 1.17]	0.240	1.05 [0.67, 1.66]	0.819
Higher	0.93 [0.58, 1.49]	0.762	0.94 [0.56, 1.58]	0.809
Husband's education				
No education (ref)	1.00		1.00	
Primary	1.23 [0.75, 2.01]	0.417	1.28 [0.72, 2.27]	0.407
Secondary	1.22 [0.81, 1.84]	0.343	1.19 [0.70, 2.02]	0.520
Higher	1.20 [0.78, 1.85]	0.404	1.31 [0.77, 2.25]	0.317
Household wealth index				
Poorest (ref)	1.00		1.00	
Poorer	0.93 [0.57, 1.51]	0.760	1.02 [0.52, 1.98]	0.959
Middle	**1.69 [1.05, 2.73]**	**0.030**	1.06 [0.55, 2.05]	0.867
Richer	1.58 [0.94, 2.64]	0.083	0.76 [0.37, 1.53]	0.441
Richest	1.17 [0.65, 2.12]	0.594	1.15 [0.55, 2.38]	0.712
Region				
North west (ref)	1.00		1.00	
North east	**1.54 [1.07, 2.21]**	**0.020**	1.14 [0.67, 1.96]	0.627
North central	0.89 [0.62, 1.29]	0.554	0.66 [0.42, 1.01]	0.056
South east	**0.30 [0.18, 0.50]**	**< 0.001**	**0.29 [0.17, 0.50]**	**< 0.001**
South south	**0.50 [0.32, 0.80]**	**0.004**	0.64 [0.38, 1.08]	0.092

Characteristic	Wives		Husbands	
	Adjusted OR (95% CI)	**p-value**	**Adjusted OR (95% CI)**	**p-value**
South west	**0.29 [0.17, 0.49]**	**< 0.001**	**0.51 [0.31, 0.86]**	**0.012**
Type of place of residence				
Urban (ref)	1.00		1.00	
Rural	1.00 [0.75, 1.32]	0.983	1.09 [0.77, 1.54]	0.640
Wife's BMI (kg/m²)	**1.07 [1.05, 1.10]**	**< 0.001**	1.01 [0.99, 1.03]	0.282
Wife's parity				
0 (ref)	1.00		1.00	
1–2	1.31 [0.65, 2.64]	0.448	1.55 [0.71, 3.35]	0.269
3–4	1.21 [0.62, 2.33]	0.578	1.75 [0.81, 3.76]	0.151
5+	1.32 [0.66, 2.63]	0.431	1.58 [0.72, 3.48]	0.258
Husband's parity				
0 (ref)	1.00		1.00	
1–2	1.06 [0.69, 1.62]	0.801	1.00 [0.62, 1.60]	0.991
3–4	1.10 [0.72, 1.69]	0.646	1.04[0.66, 1.65]	0.858
5+	1.11 [0.74, 1.66]	0.625	0.77 [0.47, 1.26]	0.291

Table 6
b: Survey-weighted multivariable logistic regression of factors associated with self-reported hypertension diagnosis among wives and husbands

Characteristic	Wives		Husbands	
	Adjusted OR (95% CI)	***p* value**	**Adjusted OR (95% CI)**	***p* value**
Wife's alcohol consumption				
Never (ref)	1.00		1.00	
Occasionally	**1.54 [1.09, 2.16]**	**0.013**	0.89 [0.61, 1.30]	0.543
Frequently	1.04 [0.36, 3.00]	0.947	0.63 [0.22, 1.78]	0.384
Husband's alcohol consumption				
Never (ref)	1.00		1.00	
Occasionally	0.88 [0.63, 1.21]	0.429	**1.44 [1.04, 2.01]**	**0.029**
Frequently	0.85 [0.53, 1.34]	0.478	**1.58 [1.01, 2.45]**	**0.044**
Wife's working status				
Not working (ref)	1.00		1.00	
Working	1.22 [0.90, 1.65]	0.204	1.01 [0.75, 1.35]	0.971
Husband's working status				
Not working (ref)	1.00		1.00	
Working	0.79 [0.43, 1.46]	0.451	0.81 [0.35, 1.89]	0.623
Respondents in the model	4,198		2,843	

Note: Adjusted OR from survey-weighted logistic regression, with [95% CI] and *p* value. ref = reference category. Both models are mutually adjusted for all variables listed. Values in bold indicate $p < 0.05$. Model fit: wife model $F(31, 1272) = 6.36$, $p < 0.001$; husband model $F(31, 1242) = 2.38$, $p < 0.001$. Analysis restricted to respondents screened for the condition.

Factors associated with self-reported diabetes among wives and husbands

Holding other variables constant, wives' age (aOR 1.11 per year; 95% CI: 1.03, 1.20) significantly increases the odds of reporting diabetes among wives, while husbands' age is not significant for reporting diabetes among husbands. The odds of reporting diabetes increase significantly with primary education level compared to no education for both wives and husbands. Wives in the richer and husbands in the poorer wealth indices have significantly lower odds of reporting diabetes. Wives from the Southwest have significantly lower odds than those from the Northwest. The odds decrease

significantly for wives whose husbands have 1–2, 3–4, or 5 or more children compared to wives whose husbands have no children. Among husbands, the odds of reporting diabetes are 59% lower among husbands with 1–2 and 3–4 children compared to husbands with no children. Residence, husbands' education, husband/wife employment status, and wife parity are not significantly associated with the odds of reporting diabetes among wives and husbands (Table 7).

Table 7
Survey-weighted multivariable logistic regression of factors associated with self-reported diabetes diagnosis among wives and husbands

Characteristic	Wives		Husbands	
	Adjusted OR (95% CI)	***p* value**	**Adjusted OR (95% CI)**	***p* value**
Wife's age (years)	**1.11 [1.03, 1.20]**	**0.006**	1.00 [0.95, 1.05]	0.988
Husband's age (years)	1.01[0.95, 1.08]	0.699	1.02 [0.97, 1.07]	0.377
Wife's education				
No education (ref)	1.00		1.00	
Primary	**3.16 [1.07, 9.32]**	**0.037**	**3.09 [1.38, 6.92]**	**0.006**
Secondary	2.68 [0.80, 8.91]	0.109	2.20 [0.91, 5.30]	0.079
Higher	1.65 [0.41, 6.63]	0.476	1.94 [0.72, 5.22]	0.187
Husband's education				
no education (ref)	1.00		1.00	
Primary	0.42 [0.09, 1.91]	0.261	0.77 [0.29, 2.05]	0.598
Secondary	0.36 [0.14, 0.96]	0.042	0.80 [0.31, 2.06]	0.643
Higher	0.66 [0.23, 1.95]	0.456	0.55 [0.23, 1.95]	0.230
Household wealth index				
Poorest (ref)	1.00		1.00	
Poorer	0.73 [0.16, 3.33]	0.679	**0.19 [0.16, 3.33]**	**0.010**
Middle	0.25 [0.06, 1.10]	0.067	0.47 [0.15, 1.46]	0.190
Richer	**0.13 [0.03, 0.61]**	**0.010**	0.58 [0.19, 1.73]	0.325
Richest	0.51 [0.09, 2.88]	0.449	0.70 [0.22, 2.25]	0.551
Region				
North west (ref)	1.00		1.00	
North east	2.60 [0.84, 8.09]	0.099	0.63 [0.21, 1.84]	0.397
North central	0.67 [0.20, 2.26]	0.519	0.83 [0.35, 1.96]	0.669
South east	0.91 [0.24, 3.40]	0.887	0.50 [0.19, 1.28]	0.147
South south	0.26 [0.07, 1.03]	0.054	0.86 [0.35, 2.11]	0.743

Characteristic	Wives		Husbands	
	Adjusted OR (95% CI)	***p* value**	**Adjusted OR (95% CI)**	***p* value**
South west	**0.18 [0.04, 0.87]**	**0.033**	0.84 [0.32, 2.19]	0.723
Type of place of residence				
Urban (ref)	1.00		1.00	
Rural	0.58 [0.24, 1.39]	0.225	0.91 [0.51, 1.62]	0.757
Wife's BMI (kg/m²)	1.06 [0.99, 1.13]	0.078	1.00 [0.96, 1.04]	0.933
Wife's parity				
0 (ref)	1.00		1.00	
1–2	1.50 [0.40, 5.64]	0.552	1.27 [0.35, 4.60]	0.716
3–4	0.85 [0.34, 2.13]	0.724	1.39 [0.38, 5.02]	0.616
5+	1.00 [1.00, 1.00]	.	1.24 [0.36, 4.26]	0.736
Husband's parity				
0 (ref)	1.00		1.00	
1–2	**0.13 [0.03, 0.49]**	**0.003**	**0.41 [0.18, 0.93]**	**0.032**
3–4	**0.29 [0.10, 0.85]**	**0.024**	**0.35 [0.15, 0.78]**	**0.011**
5+	**0.27 [0.10, 0.69]**	**0.007**	0.60 [0.29, 1.24]	0.166

Table 7

b: Survey-weighted multivariable logistic regression of factors associated with self-reported diabetes diagnosis among wives and husbands

Characteristic	Wives		Husbands	
	Adjusted OR (95% CI)	***p* value**	**Adjusted OR (95% CI)**	***p* value**
Wife's working status				
Not working (ref)	1.00		1.00	
Working	1.07 [0.44, 2.62]	0.874	1.36 [0.70, 2.65]	0.366
Husband's working status				
Not working (ref)	1.00		1.00	
Working	1.00 [1.00, 1.00]	.	0.39 [0.12, 1.32]	0.131
Respondents in the model	1,482		1,636	

Note: Adjusted OR from survey-weighted logistic regression, with [95% CI] and *p* value. ref = reference category. Both models are mutually adjusted for all variables listed. Values in bold indicate $p < 0.05$. Model fit: wife model $F(31, 1272) = 6.36$, $p < 0.001$; husband model $F(31, 1242) = 2.38$, $p < 0.001$. Analysis restricted to respondents screened for the condition.

Factors associated with spousal hypertension and diabetes self-reported diagnosis

Among couples who were screened and diagnosed, 38.9% (95% CI: 36.4, 41.4) had at least one spouse reporting a diagnosis of hypertension, while 19.7% (95% CI: 16.6, 23.3) of either partner reported a diagnosis of diabetes. Conditioning on other variables, the odds of at least one spouse reporting hypertension increase with wife age (aOR 1.02; 95% CI 1.00, 1.05) and wife BMI (aOR 1.05; 95% CI 1.03, 1.07). Couples in the North Central, South-south, Southeast, and Southwest have significantly lower odds than those in the Northwest. Couples in the Northeast have 59% higher odds of at least one spouse reporting hypertension than couples in the Northwest. Wife/husband education, wife/husband working status, and wife/husband alcohol consumption are not significantly associated with the odds of at least one spouse reporting hypertension. The odds of any spouse reporting diabetes increase significantly with husbands having primary education, whereas husbands having 1–2, 3–4, or 5 or more children decrease the odds of at least one spouse reporting diabetes, while holding other variables constant (Table 8).

Table 8

Survey-weighted multivariable logistic regression factors associated with spousal hypertension and diabetes self-reported diagnosis

Characteristic	Hypertension		Diabetes	
	Adjusted OR (95% CI)	***p* value**	**Adjusted OR (95% CI)**	***p* value**
Wife's age (years)	**1.02 [1.00, 1.05]**	**0.048**	1.02 [0.98, 1.07]	0.363
Husband's age (years)	1.02 [1.00, 1.04]	0.055	1.03 [0.99, 1.08]	0.190
Wife's education				
No education (ref)	1.00		1.00	
Primary	0.94 [0.64, 1.40]	0.771	**4.05 [1.56, 10.55]**	**0.004**
Secondary	0.72 [0.50, 1.05]	0.086	1.84 [0.75, 4.52]	0.184
Higher	0.75 [0.48, 1.16]	0.196	1.12 [0.42, 2.96]	0.818
Husband's education				
No education (ref)	1.00		1.00	
Primary	0.87 [0.54, 1.40]	0.570	0.68 [0.23, 2.04]	0.492
Secondary	0.92 [0.61, 1.40]	0.706	0.48 [0.17, 1.36]	0.168
Higher	0.80 [0.52, 1.24]	0.320	0.38 [0.14, 1.04]	0.060
Household wealth index				
Poorest (ref)	1.00		1.00	
Poorer	0.83 [0.49, 1.41]	0.482	0.53 [0.13, 2.12]	0.368
Middle	0.82 [0.50, 1.35]	0.437	0.50 [0.14, 1.73]	0.271
Richer	0.71 [0.41, 1.22]	0.215	0.43 [0.13, 1.44]	0.171
Richest	0.69 [0.38, 1.23]	0.204	0.50 [0.14, 1.82]	0.292
Regions				
North west (ref)	1.00		1.00	
North east	**1.59 [1.06, 2.39]**	**0.026**	1.28 [0.43, 3.81]	0.661
North central	**0.66 [0.46, 0.97]**	**0.033**	0.58 [0.27, 1.27]	0.173
South east	**0.26 [0.16, 0.42]**	**< 0.001**	0.43 [0.18, 1.05]	0.065
South south	**0.50 [0.31, 0.80]**	**0.003**	**0.39 [0.17, 0.90]**	**0.027**

Characteristic	Hypertension		Diabetes	
	Adjusted OR (95% CI)	***p* value**	**Adjusted OR (95% CI)**	***p* value**
South west	**0.34 [0.22, 0.54]**	**< 0.001**	0.41 [0.16, 1.06]	0.066

Table 8

b: Survey-weighted multivariable logistic regression factors associated with spousal hypertension and diabetes self-reported diagnosis

Characteristic	Hypertension		Diabetes	
	Adjusted OR (95% CI)	***p* value**	**Adjusted OR (95% CI)**	***p* value**
Type of place of residence				
Urban (ref)	1.00		1.00	
Rural	1.15 [0.87, 1.52]	0.337	0.81 [0.48, 1.36]	0.422
Wife's BMI (kg/m²)	**1.05 [1.03, 1.07]**	**< 0.001**	1.00 [0.97, 1.04]	0.909
Wife's parity				
0 (ref)	1.00		1.00	
1–2	1.53 [0.82, 2.87]	0.184	2.08 [0.50, 8.59]	0.313
3–4	1.42 [0.76, 2.66]	0.266	1.92 [0.48, 7.75]	0.360
5+	1.42 [0.74, 2.73]	0.296	1.48 [0.38, 5.70]	0.572
Husband's parity				
0 (ref)	1.00		1.00	
1–2	0.79 [0.54, 1.17]	0.243	**0.27 [0.12, 0.59]**	**0.001**
3–4	0.93 [0.63, 1.39]	0.729	**0.23 [0.11, 0.52]**	**< 0.001**
5+	0.70 [0.47, 1.05]	0.088	**0.37 [0.17, 0.80]**	**0.012**
Wife's alcohol consumption				
Never (ref)	1.00			
Occasionally	1.21 [0.90, 1.64]	0.203		
Frequently	0.75 [0.32, 1.79]	0.518		
Husband's alcohol consumption				
Never (ref)	1.00			

Note: Adjusted OR from survey-weighted logistic regression, with [95% CI] and *p* value. ref = reference category. The diabetes model was not adjusted for wife/husband alcohol consumption. Values in bold indicate $p < 0.05$. Model fit: hypertension model $F(31, 1242) = 5.51$, $p < 0.001$; Diabetes model $F(27, 1175) = 2.65$, $p < 0.001$. Analysis restricted to respondents screened for the condition. Couples classified as at least one spouse diagnosed (both screened) vs neither (both screened, neither diagnosed).

Characteristic	Hypertension		Diabetes	
	Adjusted OR (95% CI)	*p* value	Adjusted OR (95% CI)	*p* value
Type of place of residence				
Occasionally	1.16 [0.87, 1.55]	0.316		
Frequently	1.12 [0.75, 1.67]	0.591		
Wife's work status				
Not working (ref)	1.00		1.00	
Working	1.12 [0.85, 1.49]	0.420	1.15 [0.63, 2.09]	0.652
Husband's work status				
Not working (ref)	1.00		1.00	
Working	0.54 [0.24, 1.23]	0.140	1.04 [0.30, 3.59]	0.952
Couples in the model	2,475		781	

Note: Adjusted OR from survey-weighted logistic regression, with [95% CI] and *p* value. ref = reference category. The diabetes model was not adjusted for wife/husband alcohol consumption. Values in bold indicate $p < 0.05$. Model fit: hypertension model $F(31, 1242) = 5.51$, $p < 0.001$; Diabetes model $F(27, 1175) = 2.65$, $p < 0.001$. Analysis restricted to respondents screened for the condition. Couples classified as at least one spouse diagnosed (both screened) vs neither (both screened, neither diagnosed).

Discussion

Hypertension and diabetes treatment cascade among couples

In this study, wives screened for blood pressure more frequently than husbands, while blood sugar screening was very infrequent and comparable between sexes. These results are consistent with other existing evidence among men and women [19] and with studies published in Africa showing that women have both higher awareness and lower prevalence of hypertension than men [20,21]. Routine contact through reproductive and child health programs likely contributes to the observed advantages of blood pressure testing among wives and may provide insight into these sex differences. The prevalence of hypertension is more than 4 times higher than that of diabetes in Nigeria [1,2], potentially making it receive greater public attention than diabetes, coupled with the fact that blood pressure screening is mostly free and non-invasive, which could explain why the screening differences between the two conditions are distinct. Low screening uptake could lead to missed diagnosis at an early stage, when

complications could be averted. Blood sugar screening should be incorporated into routine medical check-ups at no or low cost to improve early diagnosis and be made available at PHCs, which serve as the first point of contact for people with the Nigerian health system. The provision of NCD interventions through PHCs improves early diagnosis and prompt treatment, particularly in low-resource settings [22].

Also noteworthy is the higher reported prevalence among husbands, despite a lower screening coverage for hypertension and similar screening coverage for diabetes, which highlights a potential higher risk of the conditions among husbands. Existing evidence also reports that the prevalence of hypertension is higher in males (41.6%; 95% CI: 33.9, 49.8%) than in females (32.3%; 95% CI: 25.1, 40.5%) [1]. Men who are not reached by screening services may have undiagnosed hypertension or diabetes. Late diagnosis predisposes to a higher risk of complications or mortality, necessitating stronger targeted screening and early detection to lower mortality due to NCD. Additionally, the age range of husbands in the survey is 19–59 years, compared with the wives' age range of 15–49 years, suggesting a possible reason for higher risk among husbands.

The proportion of husbands currently taking medication for hypertension is higher than that of wives, while medication use was higher among wives than husbands for diabetes, even though the self-reported diagnosis was higher among husbands. A previous report noted that receiving medication and adherence to medication for chronic conditions are less likely among women compared to men. Women are also less likely to receive medication and to be recommended for monitoring in accordance with clinical guidelines [23]. There is a need to examine sex-specific barriers to diagnosis and treatment and strengthen equitable continuity of NCD care. Awareness and counselling, alongside increased financial and social accessibility and affordability of medications, are important to ensuring adherence to reduce complications and mortality from these conditions.

Comorbidity of self-reported hypertension and diabetes among couples

Comorbidity was higher among husbands than among wives; a study in Nigeria reported a similar finding, with comorbidity higher among men than women [16]. Diabetes and hypertension share several underlying causes, including obesity, vascular inflammation and endothelial dysfunction [6,7]. Although the NDHS is a nationally representative survey, the comorbidity burden may not be ascertained with precision because self-reported diagnoses were not validated by clinical assessment. These diseases are mostly asymptomatic at the early stage; the low screening uptake, especially of diabetes, reflects differential awareness alongside structural barriers to blood sugar screening, contributing to a possible underestimation of the prevalence of comorbidity.

The comorbidity gradient across education level and wealth index is inconsistent: comorbidity is high at both extremes of the wealth index among husbands and wives. Also, comorbidity is higher among wives with a primary education, but at both extremes of husbands' education levels. The wives in the Northeast region have the highest comorbidity among the regions, but the husbands in the same region have one of the lower prevalences. This pattern suggests a sex difference in the sociodemographic pattern of

comorbidity. Previous evidence from Korea reported that having a high school education and a high income, being unmarried, and being a rural resident are associated with a lower likelihood of comorbidity [17]. The contrasting patterns between wives and husbands in this study may suggest gender differences in socioeconomic conditions related to lifestyle risk or health-seeking behaviour, necessitating further investigation into how socioeconomic status interrelates with gender to determine NCD risks. The concentration of comorbidity at both ends of the wealth index indicates that it is not exclusively prevalent among the poorest or the richest. Interventions that cut across socioeconomic groups and universal access to NCD care and prevention are recommended.

Spousal concordance of hypertension and diabetes

There is concordance for self-reported hypertension among spouses, with the association between husbands' and wives' reported diagnoses showing statistical significance, but concordance was not observed for diabetes and hypertension-diabetes comorbidity. Hypertension is more prevalent among husbands whose wives are hypertensive compared to husbands whose wives are not hypertensive. Similar findings were reported among couples in the United States of America, England, China, and India [9]. Shared lifestyle, risk factors, and health behaviours may contribute to this concordance; extending NCD prevention and care beyond individual-level interventions to couple-focused strategies is crucial. A couple-focused approach is distinctly practical and easily implemented regardless of socioeconomic characteristics. Treating couples as a unit rather than separate patients in the diagnosis and management of hypertension should be considered by healthcare workers. Spouses of patients with hypertension should be screened for hypertension to assess concordance [24]. Spouses who share similar health risks may also share similar health issues, providing an opportunity for a couple-focused approach in the NCD care cascade, including lifestyle, environmental, and behavioural modifications.

Factors associated with self-reported diagnosis among wives and husbands

The odds of reporting hypertension or diabetes increase with age for both wives and husbands, with wives’ BMI also showing significantly higher odds. Age above 40 years, overweight, and obesity are identified as risk factors for hypertension and diabetes from a study in Nigeria [12]. Residence is not statistically associated with the odds of reporting hypertension. Regional patterns differed, with the South Eastern region showing markedly reduced odds of reporting hypertension among wives and husbands, similar to a previous study that reported a lower pooled prevalence in the Southeast region [1]. However, for diabetes, the South south region's odds of reporting diabetes are lower than those in the Northwest, in contrast to previous evidence that the South south zone has the highest pooled prevalence of diabetes [2]. These differences could be due to regional healthcare access, health-seeking behaviour, or differences in study designs. Vulnerable groups should be given high priority in hypertension and diabetes prevention and care to reduce complications and mortality associated with these conditions.

The observed gaps across the hypertension and diabetes care cascades, along with the sex differences, highlight the need for a more integrated, gender-responsive approach to NCD screening and

management, especially within PHCs. The contrasting patterns in screening, diagnosis, and medication use among couples call for integration of couple-based screening and referral into existing health programmes to enable concurrent assessment, early diagnosis, and continuity of care. Equitable NCD prevention and care across socioeconomic groups is needed to address the concentration of comorbidity at the extremes of the socioeconomic spectrum and to improve early detection and reduce missed diagnoses. The existence of spousal concordance further highlights why approaches to prevention and early diagnosis should extend beyond the individual to a couples-responsive approach. Concurrent intervention among spouses to address shared health problems, such as couple-based screening and shared behavioural or environmental modifications, is practicable due to the high likelihood of spousal collaboration.

The major strength of this study is its use of recent, large, nationally representative survey data on couples, allowing assessment of couples' NCD care cascade, comorbidity, spousal concordance, and associated sociodemographic characteristics. Application of survey weights and the complex sampling design improves the representativeness of the estimates and the validity of statistical inference. However, the findings should be interpreted in consideration of several limitations. Hypertension and diabetes were self-reported diagnoses and not clinical measures, which could have missed some cases of undiagnosed conditions, thus making the burden of comorbidity imprecise. The nested care cascade was intended to reduce inconsistencies in observations; however, because fewer observations were available at the cascade stages, estimates should be interpreted with caution due to low statistical power.

Additionally, the cross-sectional design impedes causal decisions, and the observed spousal concordance cannot establish whether partners’ outcomes are independently associated or reflect shared characteristics, behaviours, and healthcare-seeking patterns. Future studies incorporating clinical measurements and more detailed information on shared lifestyle factors and access to care are needed to clarify the burden of coexisting hypertension and diabetes and to evaluate the effectiveness of couple-focused interventions in Nigeria.

Conclusion

This study presents evidence on the care cascade, comorbidity, spousal concordance, and sociodemographic factors associated with self-reported diagnoses of hypertension and diabetes among couples in Nigeria, using data from the nationally representative Nigeria DHS. Blood pressure screening coverage was higher among wives than husbands, while blood sugar screening was similar for both sexes. Despite the low screening for hypertension and a similar screening rate for diabetes, husbands reported diagnoses of hypertension and diabetes more than wives. These differential NCD care cascades and sex differences observed reinforce the importance of integrated NCD care, especially at the PHC level, and ensuring continuity of care.

The comorbidity of hypertension-diabetes is higher among husbands than wives, with comorbidity concentrated in the extremes of the wealth index for both wives and husbands, reflecting the need for equitable access to NCD prevention and care. Spousal concordance was observed for reported hypertension diagnosis; no concordance was observed for diabetes and the hypertension-diabetes comorbidity, emphasising the extension of NCD prevention and care beyond community- and individual-level interventions to couple-focused strategies. Couple ages, wives' BMI, and regional differences were associated with the likelihood of reporting a diagnosis of hypertension or diabetes. Targeted interventions are imperative to prevent complications and mortality among identified high-risk populations.

Abbreviations

BMI
Body Mass Index
CI
Confidence Interval
DHS
Demographic and Health Survey
LMIC
Low- and Middle–Income Countries
NCD
Noncommunicable diseases
NDHS
Nigeria Demographic and Health Survey
OR
Odds Ratio
PHC
Primary Health Care
SDG
Sustainable Development Goals

Declarations

Ethical approval and consent to participate

The NDHS survey obtained ethical clearance from the ICF Institutional Review Board and the National Health Research Ethics Committee of Nigeria. Since the data were anonymised, this study did not obtain further ethical approval for the analysis. Permission was approved by the DHS program to utilise the data for this study. The NDHS obtained informed consent from the participants before data collection.

Consent for publication:

Not applicable.

Competing interests

The authors report no conflicts of interest.

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Author Contribution

ROO conceptualised the study. ROO and YU curated the data, developed the methodology, conducted formal analysis, and generated tables and figures. ROO, YU, IAO, and OAA contributed to the drafting of the manuscript and interpretation of findings. ROO, YU, and BG reviewed and edited the manuscript. All authors have read and approved the final manuscript.

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Data Availability

The dataset used in this study is available upon request from the DHS program. Authors are restricted from publicly sharing this data, as stated in the approval obtained for this study.

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Figures

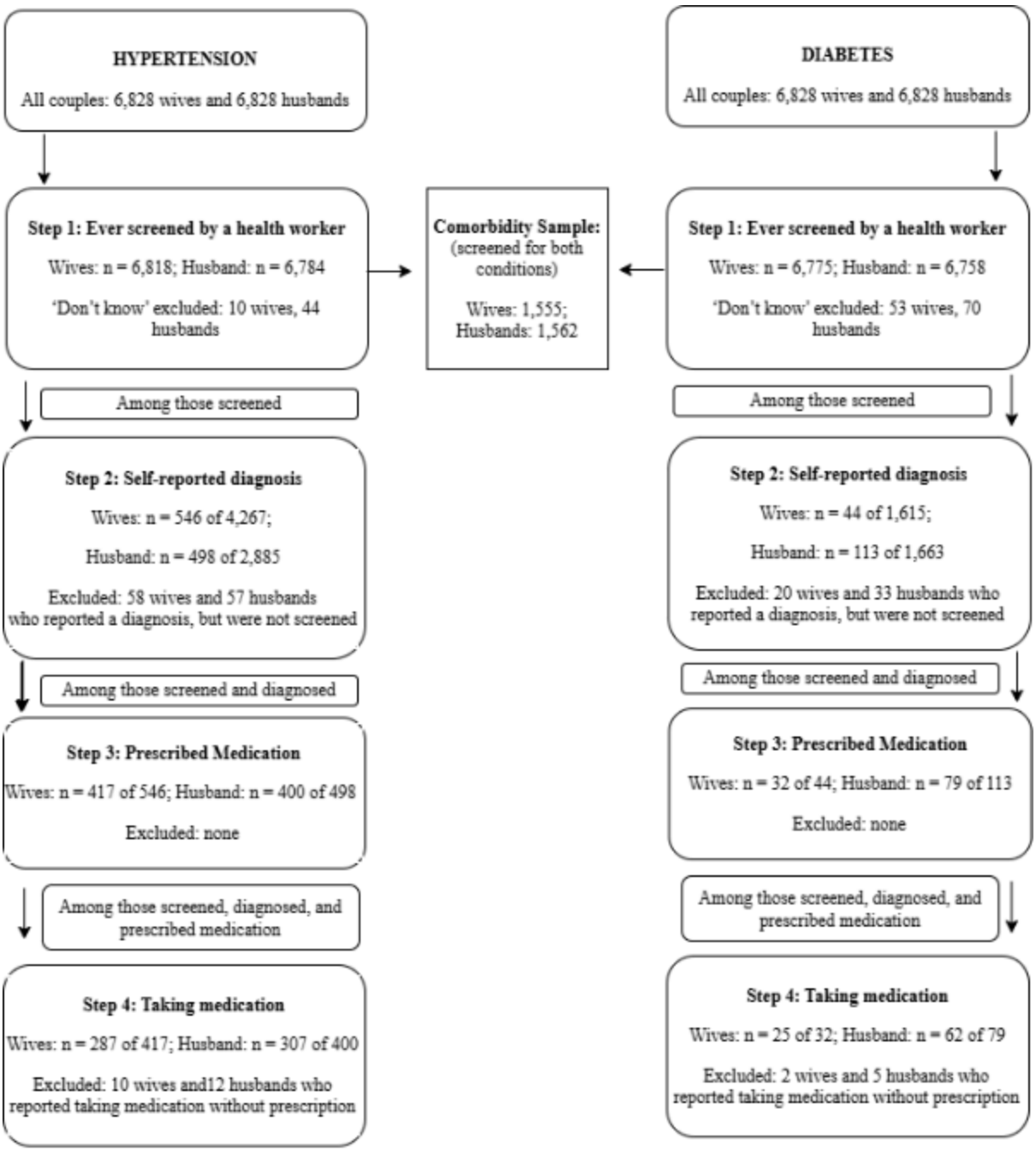


Figure 1

Analytic sample flow chart [2024 NDHS]. All counts (n) are unweighted. Each step is nested; participants who responded “yes” to a step are carried to the next step. Comorbidity sample are respondents who were screened for both hypertension and diabetes

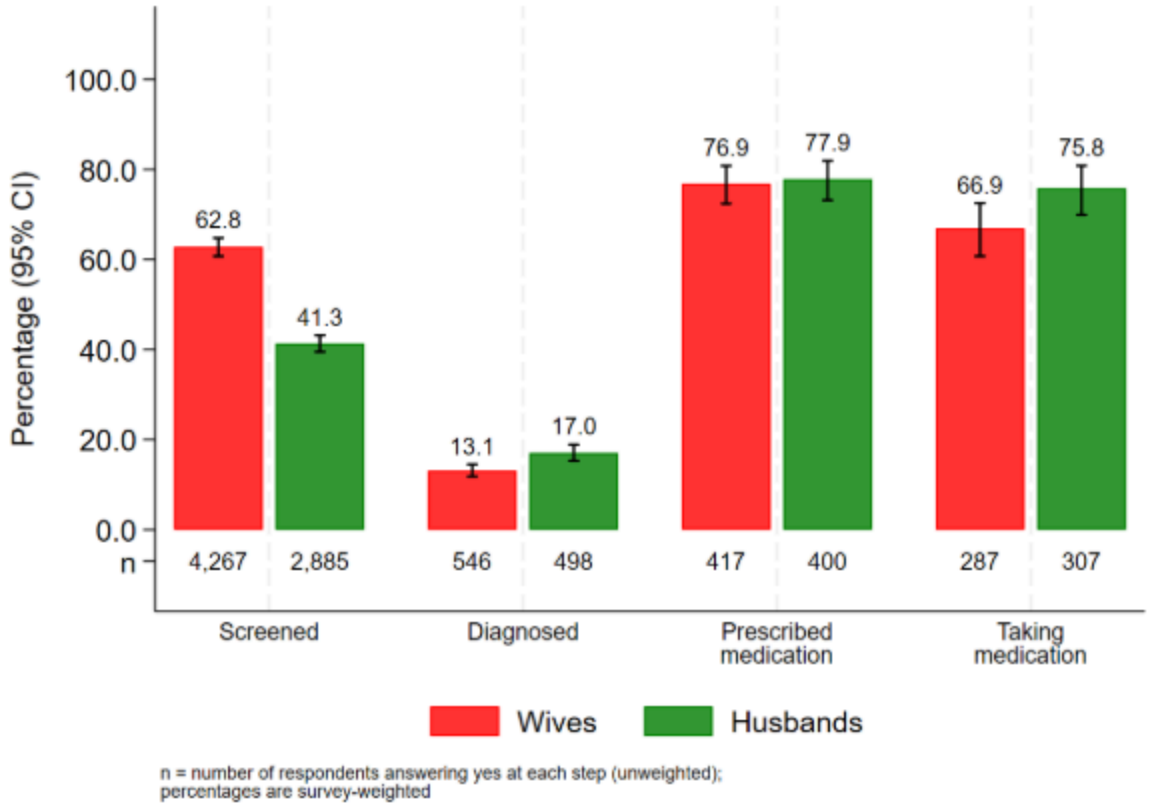


Figure 2

Hypertension care cascades among wives and husbands [2024 NDHS]. Each step is nested within the preceding step. Screened: ever had blood pressure measured (don't know excluded); diagnosed: self-reported diagnosis among those screened; prescribed medication: prescribed medication, among those screened and diagnosed; taking medication: taking medication among those screened, diagnosed, and prescribed medication. Percentages are survey-weighted; error bars show 95% confidence intervals (CI). n = unweighted number of respondents with “yes” at each step.

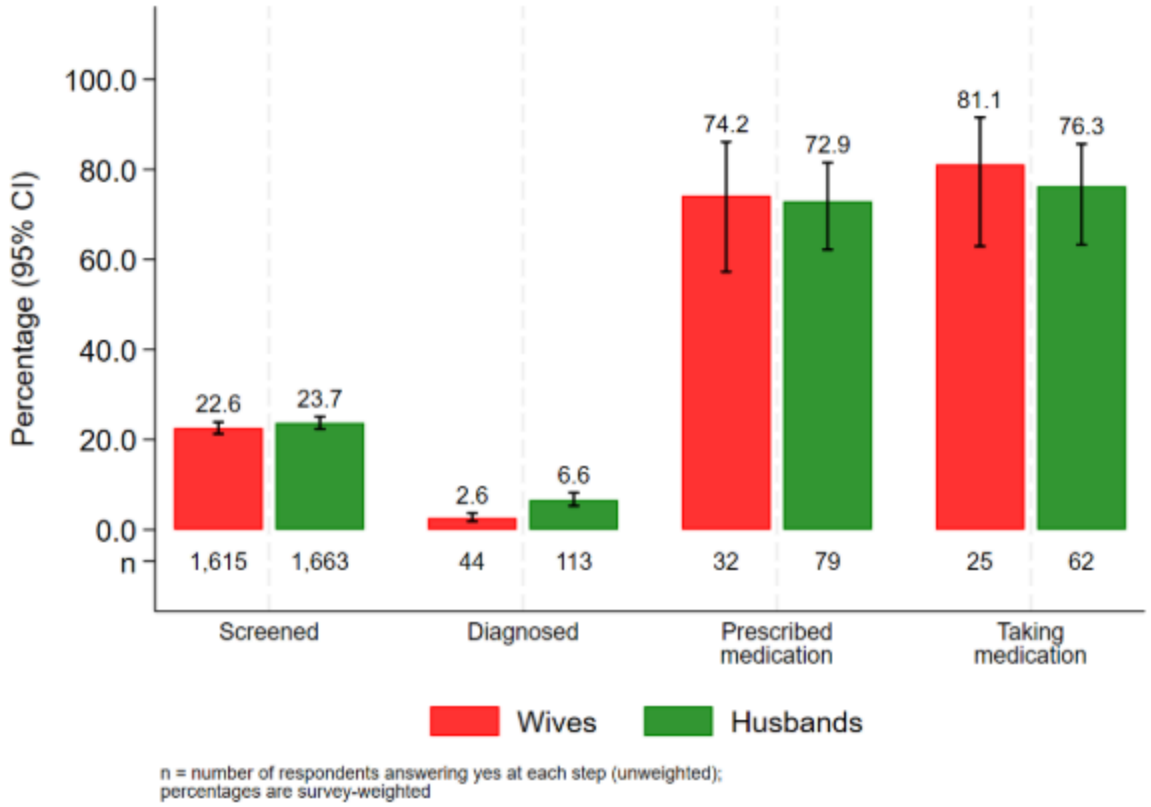


Figure 3

Diabetes care cascades among wives and husbands [2024 NDHS]. Each step is nested within the preceding step. Screened: ever had blood sugar measured (don't know excluded); diagnosed: self-reported diagnosis among those screened; prescribed medication: prescribed medication, among those screened and diagnosed; taking medication: taking medication among those screened, diagnosed, and prescribed medication. Percentages are survey-weighted; error bars show 95% confidence intervals (CI). n = unweighted number of respondents with “yes” at each step.

Supplementary Files

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- Additionalfile1.png