

SCREENING FOR CARDIOMETABOLIC DISEASE RISK FACTORS: A COMMUNITY HEALTH SCREENING PROGRAM IN URBAN CAMEROON (URBACAM-D)

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Noncommunicable diseases (NCDs) are the leading global cause of death, projected to reach 69% of mortality by 2030. In Cameroon, NCDs account for 31% of deaths, with cardiovascular disease contributing 14%. Hypertension, diabetes, and obesity are the most prevalent cardiometabolic disease (CMD) risk factors, disproportionately higher in urban areas. Limited awareness, screening, and access to care exacerbate this burden in an underfunded health system. The Body Screening Project (BSP), through the URBACAM-D program, seeks to improve early detection and awareness. This study aimed to determine the proportion of urban Cameroonians with previously undiagnosed and uncontrolled CMD-related risk factors, assess their associations, and provide health maintenance education. Additionally, the study evaluated the feasibility of the current screening strategy to inform public health policies.

Methodology

This observational study was conducted in December 2024 at Ndogbati Protestant Hospital, Douala, Cameroon. 172 urban residents participated following community outreach. Free point-of-care testing screened for hypertension, diabetes, hypercholesterolemia, anemia, hepatitis, obesity, and ECG abnormalities. BMI, BP, and biochemical measures followed standardized protocols. Participants with abnormal results received onsite physician consultation, referrals, and health education, with giveaways promoting healthy behaviors. Pre- and post-surveys assessed sociodemographic, lifestyle factors, awareness, and satisfaction. The study was approved by the Cameroon Regional Ethics Committee and Johns Hopkins IRB, with informed consent obtained.

Results

Variable	Category	iOR (95% CI)	p-value	iOR (95% CI)	p-value
Age category	≤5	5.5 (0.4-65.3)	0.132		
	18-34	0.8 (0.1-4.7)	0.849		
	35-49	2.0 (0.2-24.1)	0.585		
	50-64	2.2 (0.2-26.6)	0.529		
	≥65	1	-		
Marital status	Divorced	/	/	/	1.000
	Married	2.3 (1.1-4.9)	0.028	2.0 (0.9-4.5)	0.080
	Widowed	3.4 (1.3-9.6)	0.010	2.8 (1.1-7.6)	0.042
	Single	1	-	1	-
Gender	Female	1.1 (0.5-2.1)	0.367		
	Male	1	-		
Monthly income	100-200,000 FCFA	0 (0-)	0.999		
	50-100,000 FCFA	0.6 (0.3-1.4)	0.276		
	<50,000 FCFA	1	-		
	Unemployed	1	-		
Employment status	Full-time employed	0.8 (0.3-1.8)	0.564		
	Part-time employed	/	/		
	Retired	1.3 (0.4-4.2)	0.719		
	Self-employed	0.6 (0.2-1.5)	0.281		
	Student	0.5 (0.1-2.2)	0.322		
	Unemployed	1	-		
Education level	No formal education	1	-		
	Primary school	0.9 (0.3-2.9)	0.915		
	Secondary school	0.4 (0.2-1.1)	0.076		
	Higher National Diploma	0.2 (0.1-1.0)	0.053		
	Bachelor's	0.1 (0-0.7)	0.013		
	Master's	0.4 (0.1-1.8)	0.220		
Moderate-intensity aerobic activity (minutes)	0	2.1 (0.5-7.9)	0.283		
	1-30	2.2 (0.6-8.3)	0.256		
	150+	3.5 (0.2-51.9)	0.363		
	31-60	1.3 (0.3-5.9)	0.723		
	61-149	1	-		
Vigorous-intensity aerobic activity (minutes)	0	5.9 (0.7-53.2)	0.111		
	1-30	5.2 (0.6-48.7)	0.145		
	150+	/	/		
	31-60	5.0 (0.5-51.8)	0.177		
	61-149	1	-		
Overall activity level	Lightly active	4.5 (0.8-25.2)	0.087	3.4 (0.5-21.4)	0.201
	Moderately active	2.1 (0.4-11.8)	0.389	2.6 (0.4-16.7)	0.318
	Sedentary	4.0 (0.8-21.6)	0.103	3.0 (0.5-18.9)	0.234
	Very active	1	-	1	-
Sitting >30 min at a time	No	0.5 (0.2-1.0)	0.037	0.6 (0.3-1.5)	0.280
	Yes	1	-	1	-
Currently smokes/chews cigarettes	No	1.1 (0.2-5.6)	0.920		
	Yes	1	-		
Fasting status	No	0.7 (0.3-1.6)	0.395		
	Yes	1	-		
Drinking habits (past year)	Current infrequent	1.2 (0.4-3.3)	0.752		
	Current light	0.7 (0.3-1.8)	0.460		
	Current moderate	2.8 (0.7-10.3)	0.132		
	Former infrequent	1.2 (0.5-3.0)	0.718		
	Former regular	1.0 (0.2-5.6)	1.000		
	Lifetime abstainer	1	-		
PHQ2 score ≥3	No	0.4 (0.2-0.9)	0.028	0.4 (0.2-0.9)	0.038
	Yes	1	-	1	-

Table 1: Analysis of the association between sociodemographic & lifestyle characteristics and hypertension

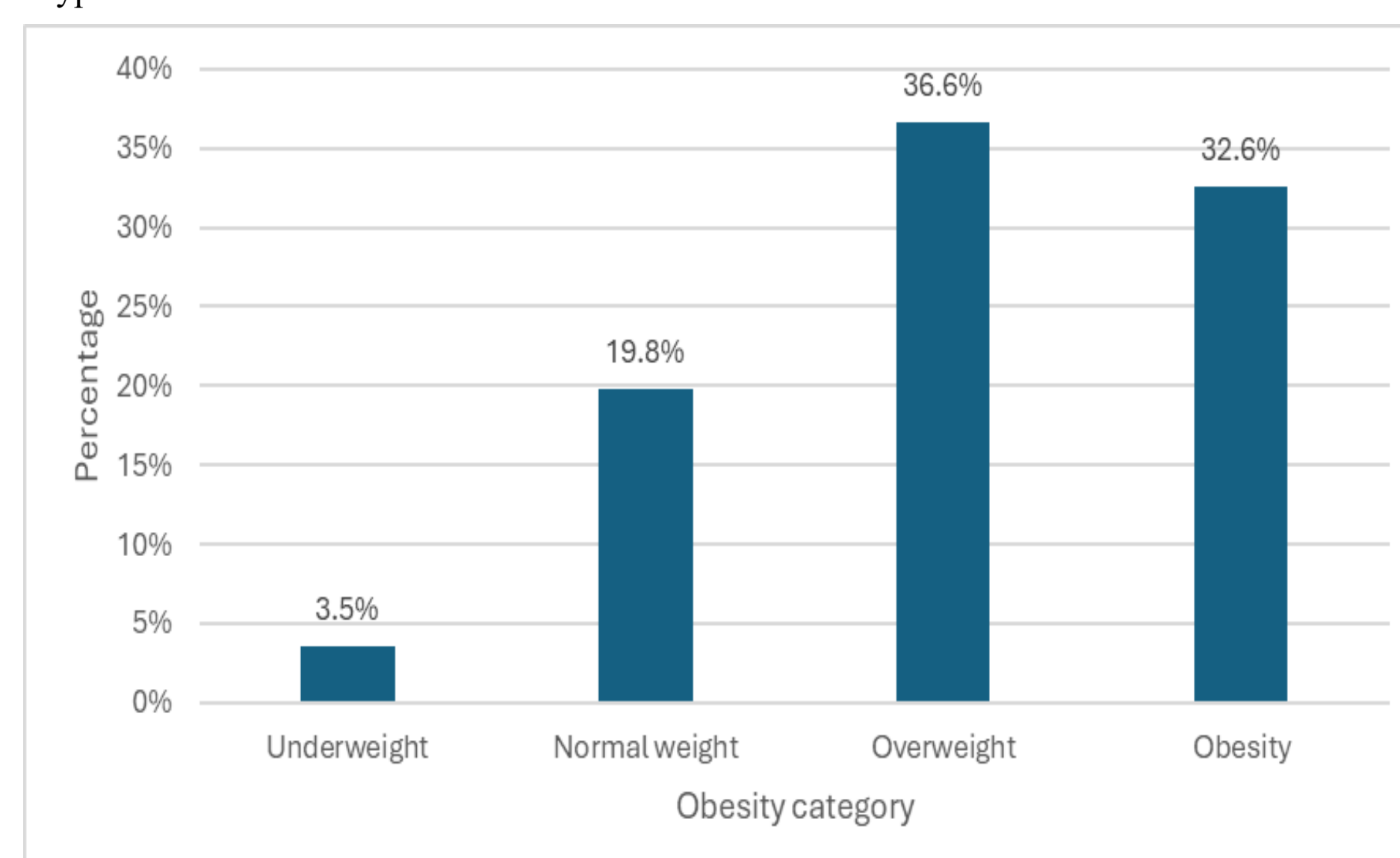


Figure 1: Proportion of obesity categories among the study participants

Variable	Category	iOR (95% CI)	p-value	iOR (95% CI)	p-value
Age category	≤5	8.0 (0.6-99.7)	0.106	8.0 (0.4-158.2)	0.171
	18-34	1.9 (0.2-22.9)	0.622	1.2 (0.1-21.8)	0.966
	35-49	8.3 (0.7-93.4)	0.103	6.0 (0.3-116)	0.236
	50-64	17.5 (1.3-238.9)	0.032	17.5 (0.8-388.7)	0.079
	≥65	1	-	1	-
Marital status	Divorced	/	/	/	
	Married	3.3 (1.4-7.7)	0.005		
	Widowed	4.9 (1.5-16.1)	0.009		
	Single	1	-		
Gender	Female	3.7 (1.7-8.1)	0.001	3.7 (1.3-10.4)	0.013
	Male	1	-	1	-
Monthly income	100-200,000 FCFA	0.9 (0.4-1.7)	0.900		
	50-100,000 FCFA	0.6 (0.2-1.3)	0.201		
	<50,000 FCFA	1	-		
	Unemployed	1	-		
Employment status	Full-time employed	0.6 (0.2-1.7)	0.335		
	Part-time employed	/	/		
	Retired	0.9 (0.2-4.2)	0.889		
	Self-employed	0.7 (0.2-2.2)	0.511		
Education level	Student	0.1 (0-0.4)	0.004		
	Unemployed	1	-		
	HND	0.2 (0-1.0)	0.052		
	Doctorate	/	/		
Moderate-intensity aerobic activity (minutes)	0	14.8 (3.3-66.7)	0.000	16.1 (0.9-283)	0.057
	1-30	8.2 (1.9-35.2)	0.005	15.2 (1.2-199.1)	0.038
	150+	2.7 (0.1-57.6)	0.532	3.1 (0-202.4)	0.580
	31-60	8.8 (1.5-42.4)	0.015	5.9 (0.6-60.3)	0.135
	61-149	1	-	1	-
	Unemployed	1	-		
Vigorous-intensity aerobic activity (minutes)	0	8.0 (1.3-47.6)	0.022	0.2 (0-4.5)	0.321
	1-30	5.8 (0.9-36.3)	0.059	0.4 (0-7.8)	0.524
	150+	2.0 (0.1-51.6)	0.676	/	/
	31-60	5.2 (0.7-37.9)	0.104	0.4 (0-6.7)	0.515
	61-149	1	-	1	-
Muscle-strengthening activities (days/week)	0	4.2 (0.2-89.2)	0.322		
	1-2	1.6 (0.1-28.6)	0.749		
	3-4	5.5 (0.2-129)	0.200		
	5-6	0.3 (0-8.6)	0.442		
	7	1	-		
Overall activity level	Lightly active	3.6 (0.7-17.3)	0.112	0.7 (0-10.1)	0.765
	Moderately active	4.8 (1-24)	0.054	3.5 (0.3-34)	0.298
	Sedentary	9.6 (2-47.5)	0.005	1.6 (0.1-31.2)	0.755
	Very active	1	-	1	-
Sitting >30 min at a time	No	0.6 (0.3-1.4)	0.281		
	Yes	1	-		
Currently smokes/chews cigarettes	No	3.2 (0.6-16.6)	0.165	5.7 (0.7-48.3)	0.103
	Yes	1	-	1	-
Fasting status	No	1.0 (0.4-2.6)	0.929		
	Yes	1	-		
Drinking habits (past year)	Current infrequent	2.5 (0.7-9.0)	0.160		
	Current light	1.3 (0.5-3.6)	0.643		
	Current moderate	1.4 (0.4-5.2)	0.641		
	Former infrequent	2.1 (0.7-6.1)	0.185		
	Former regular	2.5 (0.3-23.9)	0.426		
	Lifetime abstainer	1	-		
PHQ2 score ≥3	No	1.2 (0.5-2.8)	0.713		
	Yes	1	-		

Table 2: Analysis of the association between sociodemographic & lifestyle characteristics and obesity

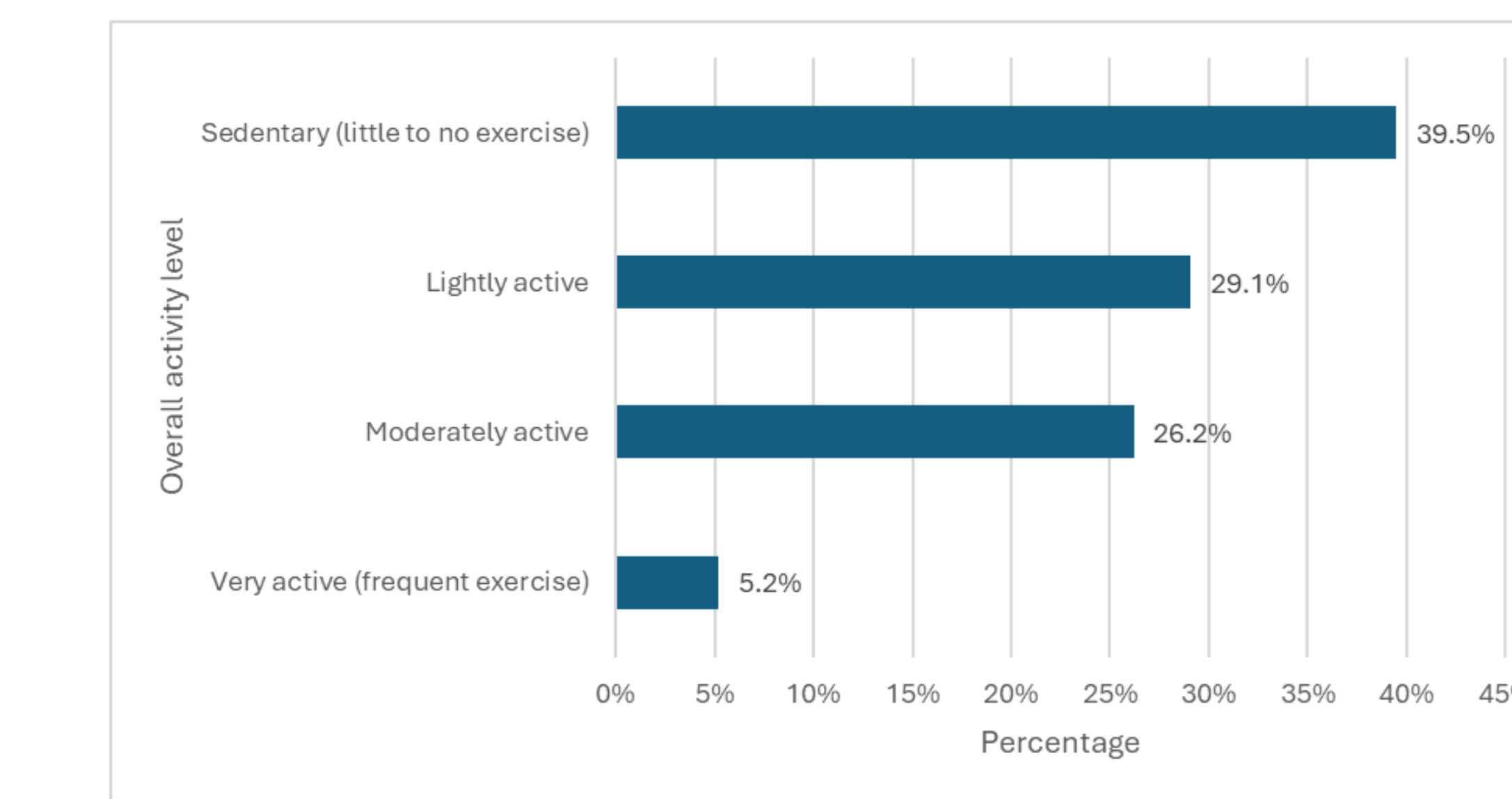


Figure 2: Proportion of overall activity level performed by the study participants

Conclusion

Key Findings

- High prevalence, with 72.5% previously undiagnosed, consistent with low awareness rates across SSA. Widowhood increased risk, while absence of depression reduced risk, highlighting a psychosocial dimension.
- PHQ-2 screening identified 24% with depressive symptoms; its significant association with hypertension highlights the need for robust mental health referral pathways.
- Nearly three-quarters of participants were overweight/obese, with higher risk in women and in those with low physical activity.
- **Feasibility:** Task-shifting to trained nurses and medical assistants proved effective, with physicians available for immediate referral. This model is scalable, affordable, and impactful for community-based CMD detection.
- **Limitations:** The URBACAM-D program demonstrated high feasibility and direct community impact, but its cross-sectional design and single-site urban sample limit causal inference and generalizability. Single-visit BP measurement and PHQ-2 screening, while practical, may under- or over-estimate true prevalence.

References

