Journal of Public Health and Environmental Research, 2(2):88–96, July-December: 2026.
DOI: https://doi.org/10.58612/jpher2210

Journal of Public Health and Environmental Research
ISSN (Online): 3108-3196

Journal homepage: https://www.fpub.org/journal-details.php?journal-id=41

Research Article

Influence of Health Education Programs on the Prevention and Management of Non-Communicable Diseases in Rivers South-East Senatorial District, Nigeria

Henrietta Elechi Ubojiekere [1*], Boma Judith Fubara[1], Salome Amarachi Ike-Wegbom [1], Queen Desmond Atuzie [1], Anthony Ike Wegbom [1] and Samuel Gentle Kitoye [2]

[1]*Department of Public Health, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Rivers State, Nigeria.*
[2]*Department of Human Kinetic Health and Safety, Ignatius Ajuru University of Education, Rivers State, Port Harcourt, Nigeria.*
[*]*Corresponding author: ubojiekere.henrietta@rsu.edu.ng*

Article Info

Keywords: *Community-based health education, Non-communicable diseases, Disease prevention, Disease management, Health education exposure.*

Received: *28.09.2026;*
Accepted: *25.10.2026;*
Published: *03.11.2026*

© *2026 by the author's. The terms and conditions of the Creative Commons Attribution (CC BY) license apply to this open access article.*

Abstract

Health education is an important public health strategy for promoting healthy lifestyles, preventing non-communicable diseases (NCDs), and supporting the effective management of existing conditions. However, exposure to health information does not always translate into consistent preventive behaviours or appropriate disease-management practices. This study assessed the influence of health education programmes on the prevention and management of NCDs among residents of Rivers South-East Senatorial District, Rivers State, Nigeria, with particular emphasis on health education exposure, preventive and management practices, and their association. A cross-sectional study design was adopted among 386 residents aged 30 years and above across the seven Local Government Areas in the senatorial district. Data were collected using a structured questionnaire and analysed using descriptive statistics and binary logistic regression to examine the relationship between health education exposure and NCD prevention and management practices. The findings revealed that 62.2% of respondents had high exposure to health education on NCDs, while 37.8% had low exposure. Community health outreach was the most frequently reported source of health education, followed by primary health centres and community meetings. Despite the relatively high level of educational exposure, gaps remained in the adoption of recommended preventive and management practices. Overall, 51.8% of respondents demonstrated positive prevention and management practices, while 48.2% had poor practices. Regular adherence to prescribed medication was the most frequently reported practice (65.3%), followed by limiting alcohol intake (57.0%) and attending follow-up clinic visits (54.4%). In contrast, daily consumption of fruits and vegetables (46.6%), regular physical exercise (42.7%) and routine health screening (45.3%) were less frequently reported. Higher exposure to community-based health education was significantly associated with better overall NCD prevention and management practices after adjustment for selected socio-demographic characteristics. However, the associations between health education exposure and individual practices, including medication adherence, dietary practices, physical activity, follow-up clinic attendance and routine screening, were not statistically significant. These findings suggest that although health education reached a substantial proportion of residents, important gaps persisted in translating educational exposure into specific preventive and management behaviours. The study concludes that health education is associated with more favourable overall NCD prevention and management practices, although the cross-sectional design does not establish causality. It is recommended that health education programmes be strengthened through regular and accessible health education, practical lifestyle counselling, routine screening, referral services and sustained support for individuals living with NCDs.

How To Cite: H.E. Ubojiekere, B.J. Fubara, S.A. Ike-Wegbom, Q.D. Atuzie, A.I. Wegbom, and S.G. Kitoye. Influence of Health Education Programs on the Prevention and Management of Non-Communicable Diseases in Rivers South-East Senatorial District, Nigeria. *Journal of Public Health and Environmental Research*, 2(2):88–96, 2026. https://doi.org/10.58612/jpher2210

1. Introduction

Non-communicable diseases (NCDs), including cardiovascular diseases, cancers, chronic respiratory diseases and diabetes mellitus, are major global public health challenges associated with premature mortality, disability and increased healthcare costs. The World Health Organization [1] estimated that NCDs accounted for 43 million deaths worldwide in 2021, with most premature deaths occurring in low- and middle-income countries. Their burden is associated with modifiable risk factors, including unhealthy diets, physical inactivity, tobacco use, harmful alcohol consumption and environmental exposures [2]. The increasing burden of NCDs therefore highlights the need for comprehensive strategies that integrate prevention, early detection and sustained disease management.

In sub-Saharan Africa, the growing burden of NCDs has intensified pressure on healthcare systems already addressing communicable diseases and other public health priorities [3]. Rapid urbanisation, socioeconomic inequalities and unfavourable living conditions may further constrain access to preventive services and healthy lifestyle choices [4]. These challenges emphasise the importance of strengthening primary healthcare and ensuring equitable access to essential health services [5]. Furthermore, weaknesses in the implementation of NCD prevention policies across African countries demonstrate the need for coordinated, accessible and sustainable community-level interventions [6].

In Nigeria, NCDs constitute an important public health concern, particularly because of persistent gaps in disease awareness, early diagnosis and long-term management. Adeloye et al. [7] documented a substantial increase in the prevalence of hypertension among Nigerian adults and identified continuing challenges in awareness, treatment and control. Similarly, Ezejimofor et al. [8] reported a considerable burden of hypertension in community-based studies across the Niger Delta. Limited resources and implementation challenges within Nigeria's primary healthcare system may further affect the delivery of effective NCD prevention services [9]. These concerns support the need for locally accessible health education that promotes healthier behaviours, early detection and appropriate disease management.

Health education provides an opportunity to deliver health information and practical guidance through primary healthcare centres, community health workers, religious institutions, community meetings and organised outreach programmes. Community health workers can contribute to NCD prevention and control through health education, counselling, screening and referral, particularly in resource-constrained settings [10]. Evidence from community-based cardiovascular disease prevention interventions also suggests that such approaches can improve knowledge of risk factors and selected preventive behaviours, although outcomes vary across interventions [11]. Reviews of community-based health education have similarly highlighted its potential contribution to NCD awareness and prevention [12]. However, distributing health information alone may not guarantee sustained behavioural change. The adoption of healthier practices also depends on individuals' capabilities, motivation and opportunities to act on the information received [13]. Consequently, effective programmes should combine education with practical lifestyle counselling, community participation and continued behavioural support [14].

Health education may also support early detection and the management of established NCDs through screening, referral, treatment adherence and follow-up. This is particularly important because conditions such as hypertension may remain undiagnosed until complications develop, a concern documented in sub-Saharan Africa [15]. Community-based screening can help identify individuals at risk, although participation may be constrained by inadequate awareness, logistical difficulties and limited trust in services [16]. For people already living with chronic conditions, health education should complement clinical care by reinforcing treatment recommendations, encouraging self-management and supporting regular monitoring. The WHO [17] recommends integrating risk assessment, lifestyle counselling, diagnosis, treatment and follow-up into primary healthcare services. Evidence from Ghana further demonstrates the potential value of combining health-system support with nurse-led hypertension management [18]. Nevertheless, the effectiveness of community-based interventions may vary according to implementation, accessibility and continuity of care [19].

In Rivers South-East Senatorial District, Rivers State, the influence of health education may depend on residents' socioeconomic circumstances, access to healthcare and opportunities to participate in health promotion activities. Financial constraints, occupational commitments, transportation difficulties and inadequate programme awareness may limit participation and the adoption of recommended preventive practices. Although existing studies provide evidence on community-based cardiovascular disease prevention, hypertension control and screening, their findings cannot automatically be generalised to the specific circumstances of Rivers South-East Senatorial District [14, 19]. There is therefore a need for context-specific evidence examining how exposure to health education relates to NCD prevention and management practices among residents of the district.

Therefore, this study assessed the influence of health education programmes on the prevention and management of NCDs in Rivers South-East Senatorial District, Rivers State, Nigeria. Specifically, it examined residents' exposure to health education, lifestyle and disease-management practices. The findings are intended to inform the development of accessible, culturally appropriate and sustainable health education strategies for strengthening NCD prevention and management.

2. Methodology

2.1. Study Design

A cross-sectional study design was used to assess the influence of community-based health education programmes on non-communicable disease prevention and management among residents of Rivers South-East Senatorial District, Rivers State, Nigeria.

2.2. Study Setting

The study was conducted in Rivers South-East Senatorial District, Rivers State, Nigeria. The district comprises seven Local Government Areas (LGAs): Andoni, Eleme, Gokana, Khana, Opobo/Nkoro, Oyigbo, and Tai. The study focused on residents of the selected communities within these local government areas.

2.3. Study Population and Sampling procedure

The study population comprised male and female residents aged 30 years and above living in Rivers South-East Senatorial District. Eligible participants were residents aged 30 years and above who were selected for participation and provided informed consent. The study used data

from 386 respondents. The minimum sample size of 386 respondents, was calculated using the Cochran formula. The sample covered the seven Local Government Areas in Rivers South-East Senatorial District.

2.4. Data Collection

Data were collected using a structured questionnaire developed for the wider study on community-based health education and non-communicable diseases. The questionnaire contained sections addressing respondents' sociodemographic characteristics, educational exposure, and other study objectives. The questionnaire was developed following a review of relevant literature to ensure that its items addressed the study objectives. The instrument was reviewed by the research supervisor for clarity and relevance and was pilot-tested among respondents with characteristics similar to those of the study population to assess the comprehensibility of the questions.

The reliability of the research instrument was assessed using Cronbach's alpha to determine the internal consistency of the relevant questionnaire items. The analysis yielded a Cronbach's alpha coefficient of 0.79, indicating an acceptable level of internal consistency.

2.5. Data Analysis

Data were summarised using frequencies and percentages to describe respondents' exposure to health education and the reported sources of information. Pearson's chi-square test was used to examine associations between exposure and selected sociodemographic characteristics. Statistical significance was set at $p < .05$.

3. Result

Table 1 presents respondents' sociodemographic characteristics according to their level of exposure to community-based health education programmes. Of the 386 respondents, 240 (62.2%; 95% CI: 57.2–66.9) had high exposure, while 146 (37.8%) had low exposure. High exposure was relatively consistent across age groups (60.8–63.5%), sex (61.0–63.2%) and educational levels (59.6–64.%). Notable differences were observed across religious affiliations, with the highest exposure among traditional religion adherents (76.5%) and the lowest among respondents belonging to other religious groups (53.8%). Geographically, Eleme recorded the highest exposure (68.2%), followed by Andoni and Gokana (66.7% each), while Opobo (54.2%) and Oyigbo (54.5%) recorded the lowest. Respondents in households of 10 or more persons also reported relatively high exposure (72.2%). Overall, high exposure predominated across the sociodemographic groups, although the observed differences remain descriptive and do not establish statistical significance.

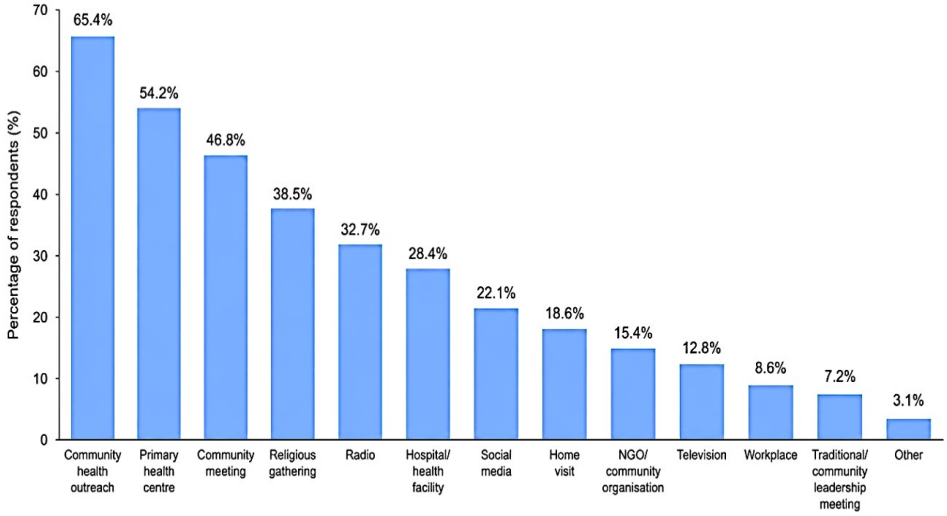


Figure 1: Sources of Health Education Received by Respondents

Figure 1 shows that community health outreach was the most commonly reported source of health education, followed by primary health centres and community meetings. Religious gatherings, radio, and health facilities were also important sources, while social media and home visits were less frequently reported. Overall, the findings suggest that community-based and primary healthcare channels are key avenues for delivering health education in the study area.

Table 2 presents respondents' prevention and management practices for non-communicable diseases (NCDs). Overall, 200 respondents (51.8%; 95% CI: 46.8–56.8) were classified as having positive prevention and management practices, while 186 (48.2%) were classified as having poor practices. Regular adherence to prescribed medication was the most frequently reported practice (65.3%), followed by limiting alcohol intake (57.0%) and attending follow-up clinic visits (54.4%). In contrast, the least frequently reported practices were engaging in at least 30 minutes of daily exercise (42.7%), undergoing regular health screening (45.3%) and consuming fruits and vegetables daily (46.6%). These findings indicate that although slightly more than half of the respondents demonstrated positive overall prevention and management practices, important gaps remained in physical activity, routine screening and healthy dietary behaviours.

Table 1: Distribution of Respondents' Characteristics with Level of Educational Exposure

Social Demographics	High n (%)	Low n (%)	95% C.I.
Overall	**240 (62.2)**	**146 (37.8)**	**57.2-66.9**
Age group			
40-49 years	90 (60.8)	58 (39.2)	52.8-68.3
50-59 years	70 (62.5)	42 (37.5)	53.3-70.9
60+	80 (63.5)	46 (36.5)	54.8-71.4
Sex			
Female	129 (63.2)	75 (36.8)	56.4-69.6
Male	111 (61.0)	71 (39.0)	53.7-67.8
Marital status			
Married	152 (61.3)	96 (38.7)	55.1-67.1
Not currently married	88 (63.8)	50 (36.2)	55.5-71.3
Level of education			
No formal education	31 (59.6)	21 (40.4)	46.1-71.8
Primary education	56 (59.6)	38 (40.4)	49.5-68.9
Secondary education	100 (64.1)	56 (35.9)	56.3-71.2
Tertiary education	53 (63.1)	31 (36.9)	52.4-72.6
Employment status			
Employed	141 (61.8)	87 (38.2)	55.4-67.9
Not employed	99 (62.7)	59 (37.3)	54.9-69.8
Religion			
Pentecostal	105 (59.7)	71 (40.3)	52.3-66.6
Orthodox	59 (60.2)	39 (39.8)	50.3-69.3
Islam	36 (69.2)	16 (30.8)	55.7-80.1
Traditional	26 (76.5)	8 (23.5)	60.0-87.6
Others	14 (53.8)	12 (46.2)	35.5-71.2
Overall	240 (62.2)	146 (37.8)	57.2-66.9
LGA			
Andoni	32 (66.7)	16 (33.3)	52.5-78.3
Eleme	30 (68.2)	14 (31.8)	53.4-80.0
Gokana	50 (66.7)	25 (33.3)	55.4-76.3
Khana	49 (59.0)	34 (41.0)	48.3-69.0
Opobo	26 (54.2)	22 (45.8)	40.3-67.4
Oyigbo	24 (54.5)	20 (45.5)	40.1-68.3
Tai	29 (65.9)	15 (34.1)	51.1-78.1
Household Size			
1-3 persons	38 (61.3)	24 (38.7)	48.8-72.4
4-6 persons	105 (62.5)	63 (37.5)	55.0-69.5
7-9 persons	58 (56.9)	44 (43.1)	47.2-66.1
10 persons and above	39 (72.2)	15 (27.8)	59.1-82.4
Number of Dependents			
None	19 (67.9)	9 (32.1)	49.3-82.1
1–2	68 (58.6)	48 (41.4)	49.5-67.2
3–5	97 (63.0)	57 (37.0)	55.1-70.2
6+	56 (63.6)	32 (36.4)	53.2-72.9
None	19 (67.9)	9 (32.1)	49.3-82.1

Note: 95% CI = 95% confidence interval

Table 2: Percentage Frequency Distribution of Prevention and Management of Non-Communicable Diseases (n = 386)

Item	Yes n (%)	No n (%)	95% CI
Take prescribed medication regularly	252 (65.3%)	134 (34.7%)	60.4-69.9
Attend follow-up clinic visits	210 (54.4%)	176 (45.6%)	49.4-59.3
Follow dietary recommendations	198 (51.3%)	188 (48.7%)	46.3-56.2
Eat fruits and vegetables daily	180 (46.6%)	206 (53.4%)	41.7-51.6
Engage in 30 minutes of exercise daily	165 (42.7%)	221 (57.3%)	37.9-47.7
Monitor weight regularly	190 (49.2%)	196 (50.8%)	44.3-54.2
Limit alcohol intake	220 (57.0%)	166 (43.0%)	52.0-61.8
Practise safe sex (oncogenic prevention)	205 (53.1%)	181 (46.9%)	48.1-58.0
Go for regular health screening	175 (45.3%)	211 (54.7%)	40.4-50.3
Overall Prevention and Management Practices	200 (51.8%)	186 (48.2%)	46.8-56.8

Note: 95% CI = 95% confidence interval.

Table 3: Prevention and Management Practices Associated with NCD Health Education among Respondents (n = 386)

Variables	Prevention Practice	Did not receive/ Not sure	Received NCD Health Education	COR (95% CI)	AOR (95% CI)
Take prescribed medication regularly	Good	90	162	1.292 (0.841-1.985)	1.311 (0.837-2.055)
	Poor	56	78	1.000	1.000
Attend follow-up clinic visits	Good	77	133	1.114 (0.737–1.683)	1.121 (0.727–1.729)
	Poor	69	107	1.000	1.000
Follow dietary recommendations	Good	70	128	1.241 (0.822–1.873)	1.252 (0.810–1.934)
	Poor	76	112	1.000	1.000
Eat fruits and vegetables daily	Good	61	119	1.370 (0.905–2.075)	1.397 (0.895–2.181)
	Poor	85	121	1.000	1.000
Engage in 30 minutes of exercise daily	Good	59	106	1.166 (0.769–1.771)	1.153 (0.738–1.802)
	Poor	87	134	1.000	1.000
Monitor weight regularly	Good	66	124	1.296 (0.858–1.958)	1.309 (0.845–2.029)
	Poor	80	116	1.000	1.000
Limit alcohol intake	Good	79	141	1.208 (0.798–1.829)	1.221 (0.789–1.890)
	Poor	67	99	1.000	1.000
Practise safe sex (oncogenic prevention)	Good	72	133	1.278 (0.846–1.930)	1.294 (0.838–1.997)
	Poor	74	107	1.000	1.000
Go for regular health screening	Good practice	60	115	1.319 (0.870–1.998)	1.349 (0.865–2.105)
	Poor practice	86	125	1.000	1.000

Table 3 shows that respondents with good prevention and management practices generally had higher adjusted odds of having received NCD health education than those with poor practices across all nine indicators. The strongest positive associations were observed for daily fruit and vegetable consumption (AOR = 1.397; 95% CI: 0.895–2.181), regular health screening (AOR = 1.349; 95% CI: 0.865–2.105), and regular medication use (AOR = 1.311; 95% CI: 0.837–2.055). However, none of the associations was statistically significant, as all adjusted 95% confidence intervals included 1.0. Therefore, although the findings showed a generally positive pattern, they did not provide sufficient statistical evidence of an association between individual prevention and management practices and receipt of NCD health education.

Table 4: Binary Logistic Regression of the Influence of Health Education on NCD Prevention and Management Practices across the Social Demographics

Predictor	COR	95% CI	p-value	AOR	95% CI	p-value
Level of Educational Exposure	1.283	1.034–1.592	0.024	1.277	1.031–1.581	0.025
Age Group						
40–49 years (Ref.)	1.000	—	—	1.000	—	—
50–59 years	0.850	0.744–0.971	0.017	1.020	1.002–1.038	0.029
60+ years	0.877	0.774–0.993	0.039	0.894	0.539–1.483	0.664
Educational Level						
No formal education (Ref.)	1.000	—	—	1.000	—	—
Primary	0.577	0.371–1.465	0.38	0.664	0.359–1.523	0.413
Secondary	0.677	0.484–0.948	0.023	0.894	0.809–0.988	0.028
Tertiary	0.738	0.479–0.957	0.027	1.011	1.001–1.021	0.027
Religion						
Orthodox (Ref.)	1.000	—	—	1.000	—	—
Islam	0.793	0.404–1.558	0.501	0.757	0.379–1.510	0.429
Others	1.600	0.661–3.872	0.297	1.601	0.643–3.982	0.312
Pentecostal	1.146	1.015–1.294	0.028	1.136	0.682–1.892	0.624
Traditional	1.125	0.515–2.457	0.768	1.247	0.557–2.788	0.591
LGA of Residence						
Andoni (Ref.)	1.000	—	—	1.000	—	—
Eleme	1.182	0.521–2.682	0.689	1.215	0.525–2.810	0.649
Gokana	1.091	0.528–2.255	0.814	1.116	0.527–2.364	0.774
Khana	1.154	0.566–2.352	0.694	1.154	0.554–2.401	0.702
Opobo/Nkoro	1.97	0.872–4.449	0.103	1.997	0.867–4.599	0.104
Oyigbo	1.418	0.624–3.224	0.404	1.443	0.622–3.347	0.393
Tai	1.555	0.682–3.543	0.293	1.602	0.686–3.739	0.276

Note: 95% CI = 95% confidence interval.

Table 4 presents the crude and adjusted associations between community-based health education exposure, sociodemographic characteristics and NCD prevention and management practices. Higher educational exposure was significantly associated with increased odds of positive prevention and management practices in both the crude (COR = 1.283; 95% CI: 1.034–1.592; p = 0.024) and adjusted models (AOR = 1.277; 95% CI: 1.031–1.581; p = 0.025). Following adjustment, respondents aged 50–59 years (AOR = 1.020; 95% CI: 1.002–1.038; p = 0.029) and those with tertiary education (AOR = 1.011; 95% CI: 1.001–1.021; p = 0.027) had slightly higher odds of positive practices than their respective reference groups. Conversely, respondents with secondary education had lower odds (AOR = 0.894; 95% CI: 0.809–0.988;

p = 0.028). Age 60 years and above, religious affiliation and local government area of residence were not significantly associated with prevention and management practices after adjustment ($p > 0.05$).

4. Discussion

The results show that 240 of the 386 respondents (62.2%) were classified as having high exposure to NCD-related health education, whereas 146 (37.8%) had low exposure. This indicates that health education had reached a sizeable proportion of adults in Rivers South-East Senatorial District, but a substantial minority remained inadequately reached. The finding is consistent with evidence that community-based approaches can improve knowledge of cardiovascular disease and its risk factors, although the reach and effects of programmes differ by setting and implementation [11, 20]. Community health workers can also extend prevention and control activities beyond conventional health facilities, especially where access to professional services is constrained [10].

Exposure was broadly similar across the age, sex, education and employment categories presented in Table 1. For example, high exposure ranged from 60.8% among respondents aged 40–49 years to 63.5% among those aged 60 years and above; it was 63.2% among females and 61.0% among males. The descriptive similarity suggests that health education was not confined to a single demographic group. Nevertheless, the table does not establish whether these small differences are statistically significant, and they should not be interpreted as evidence that access is equal. Differences were more visible across local government areas: Eleme recorded 68.2% high exposure, while Opobo/Nkoro and Oyigbo recorded 54.2% and 54.5%, respectively. These geographical variations may reflect differences in the frequency of outreach, community mobilisation, transport access or the presence of local health services. Research on health systems and urban health inequities has similarly shown that access to health information and services is shaped by the social and physical environment, rather than by individual motivation alone [4, 5].

The relatively high proportion exposed should also be interpreted alongside the study's measure of exposure. A history of receiving health education does not, by itself, indicate how recently, how often or how intensively the respondent received it, nor whether the information was understood or retained. Health literacy research indicates that the ability to access, understand and use health information is relevant to health-care use and outcomes [21]. Consequently, the implication is not simply to increase the number of people reached; programmes should also assess frequency, content comprehension, opportunities to ask questions and whether participants can translate information into daily decisions.

Figure 1 identifies community health outreach as the most frequently reported source of health education (65.4%), followed by primary health centres (54.2%) and community meetings (46.8%). Religious gatherings (38.5%), radio (32.7%) and hospital/health facilities (28.4%) were also reported, while social media (22.1%), home visits (18.6%), NCD/community organisations (15.4%), television (12.8%), workplace activities (8.6%), traditional/community leadership meetings (7.2%) and other sources (3.1%) were less commonly reported. The pattern suggests that face-to-face community channels and primary care settings are important delivery routes in the rivers south east senatorial district.

This finding is compatible with evidence supporting community-based prevention and the involvement of community health workers in NCD control [10, 11]. Community outreach can bring education closer to residents, allow discussion in familiar settings and provide opportunities to link information with screening or referral. Primary health centres are also strategically placed to connect prevention messages with clinical assessment and continuing care. Evidence from Ghana indicates that combining health-system access with nurse-led support and lifestyle counselling can improve hypertension control more effectively than access support alone [18].

Table 2 shows that 200 respondents (51.8%) were classified as having positive overall prevention and management practices, while 186 (48.2%) had poor practices. Thus, the overall distribution was only modestly favourable: nearly one in two respondents did not meet the study's criterion for positive practice. The coexistence of broad exposure to education and incomplete adoption of recommended practices is important. It suggests that information provision is necessary but may not be sufficient when people face financial, environmental, social or service-related barriers to acting on advice. Behaviour-change frameworks likewise emphasise that behaviour depends on capability, opportunity and motivation, not knowledge alone [13].

Medication adherence was the most frequently reported practice (65.3%), followed by limiting alcohol intake (57.0%) and attending follow-up clinic visits (54.4%). These results are encouraging but still leave sizeable groups reporting that they do not regularly take prescribed medication or attend follow-up. Long-term NCD management requires continued access to appropriate treatment, monitoring and support; self-management programmes can assist people living with chronic conditions to develop skills for managing symptoms and treatment [22]. In sub-Saharan Africa, barriers to hypertension care include limited access and gaps in diagnosis, treatment and control. A Nigerian systematic analysis documented a substantial hypertension burden alongside low levels of awareness, treatment and control [7]; a nationwide survey also reported a high prevalence of hypertension and the need for stronger primary-health-care responses [23]. The present findings therefore support linking education with affordable, reliable services rather than treating counselling as a stand-alone intervention.

Preventive lifestyle practices were weaker. Only 46.6% reported eating fruits and vegetables daily, 42.7% reported engaging in 30 minutes of exercise daily, and 45.3% reported regular health screening. Weight monitoring was reported by 49.2%, and 51.3% reported following dietary recommendations. These results point to practical gaps in diet, physical activity and early detection. The Global Burden of Disease risk-factor analysis identified behavioural and metabolic risks as major contributors to disease burden [2], while the analysis of NCD burden in sub-Saharan Africa documented the growing importance of chronic diseases in the region [3]. Evidence from a systematic review and meta-regression found that community-based cardiovascular prevention interventions can improve physical activity, although effects depend on intervention characteristics and follow-up [14].

The comparatively low screening figure is especially relevant because hypertension may remain undiagnosed without measurement. A systematic review of sub-Saharan African studies documented a considerable burden of undiagnosed hypertension [15]. In the Niger Delta, a systematic review and meta-analysis likewise found a substantial burden of hypertension in community-based studies [8]. Education should therefore explain not only risk factors but also where, when and how to obtain screening, what results mean, and what action is required after an abnormal result. Screening campaigns should include referral pathways and follow-up, so that identifying risk leads to assessment and appropriate care.

The findings also have implications for programme design. Practical, achievable goals—such as replacing some high-salt foods, increasing affordable local fruit and vegetable options, breaking up prolonged sitting and incorporating activity into daily routines may be

more actionable than general advice alone. Programmes should consider the local cost and availability of healthy food, safe places for activity, transport and the opportunity cost of attending clinics. Health education should be integrated with primary care, screening and referral, consistent with the broader call for coordinated action on the NCD crisis [24].

Table 3 shows that the adjusted odds ratios were above 1.0 for all the nine individual prevention and management indicators among respondents with good practice compared with those with poor practice. The largest point estimates were observed for daily fruit and vegetable consumption, regular screening and regular medication use. However, every confidence interval included 1.0. Accordingly, the individual associations were not statistically significant at the conventional 5% level. These estimates are compatible with a possible positive relationship, but they also remain compatible with no association; they should not be described as proof that health education improved any particular behaviour.

The direction of the estimates is plausible in light of evidence that community-based cardiovascular interventions can improve knowledge and selected risk-reduction behaviours [11, 20]. However, intervention studies and systematic reviews assess programmes with varying intensity, duration and support, whereas the present study is cross-sectional and measures reported exposure. These designs do not estimate the same thing. In addition, the individual analyses may have had less statistical power than the overall composite measure, and self-reported practices may be affected by recall or social-desirability bias. Further studies should measure the content, timing and intensity of education and assess behaviours prospectively, ideally with objective measures where feasible.

Table 4 provides the central finding of the study. Higher exposure to community-based health education was associated with higher odds of positive overall prevention and management practices in the crude model and after adjustment for selected sociodemographic variables. The adjusted estimate indicates 27.7% higher odds of positive practices among respondents in the higher exposure category, conditional on the variables included in the model. Because the study is cross-sectional, this is an association and should not be interpreted as a causal effect. It is also an odds comparison, not a 27.7-percentage point increase in the probability of positive practices.

The association is consistent with the broader evidence that community-based interventions can improve knowledge and some cardiovascular risk-prevention behaviours [11, 20]. It is also consistent with the proposition that education works best when supported by accessible services and practical opportunities to act. For example, the Ghana cluster-randomised trial by Ogedegbe et al. [18] found that adding a nurse-led hypertension-control strategy to health insurance coverage produced a greater reduction in systolic blood pressure than insurance coverage alone. This does not establish that the same effect would occur in Rivers South-East, but it illustrates how counselling and education can be strengthened through continuing clinical support.

The results support strengthening NCD educational exposure but not relying on exposure alone as the measure of success. Programmes should combine repeated education with blood-pressure and glucose screening, referral, treatment adherence support, follow-up, and realistic guidance on food and physical activity. Community health workers and primary health centres can help connect these elements, while monitoring should assess both reach and behavioural outcomes. This integrated approach aligns with evidence on community health workers and NCD control [10, 25], the importance of health-system strengthening [5, 9], and the need for coordinated action against NCDs [6, 24].

Article Information

Ethical Approval: Ethical approval was obtained from the Research Ethics Committee of the Faculty of Basic Medical Sciences, Rivers State University with reference number RSU/FBMS/REC/25/713.

Informed Consent: Written informed consent was obtained from all participants before their inclusion in the study.

Consent for Publication: Not applicable.

Data Availability: The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Clinical Trial Registration: Not Applicable.

Conflicts of Interest: The authors declare no conflicts of interest.

Funding: No external funding was received for this study.

Author Contributions: H.E.U. - Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Resources, Writing – Original Draft, Writing – Review & editing, Project Administration; B.J.F. - Methodology, Data Curation, Writing – Original Draft, Writing – Review & editing, Project Administration; S.A.I. - Data Curation, Writing – Review & editing; Q.D.A. - Investigation, Writing – Review & editing, Project Administration; A.I.W. - Formal Analysis, Writing – Review & editing, Supervision; S.G.K. - Writing – Review & editing, Supervision.

Acknowledgments: We sincerely acknowledge the participating communities and research assistants for their cooperation and support throughout the research period. We also express our sincere gratitude to the residents, the study participants, for their time and willingness to participate in this research.

AI Use Disclosure: No generative artificial intelligence tools were used in the preparation of this manuscript.

References

[1] World Health Organization. Noncommunicable diseases, 2025. URL https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases.

[2] GBD 2016 Risk Factors Collaborators. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*, 390(10100):1345–1422, 2016. URL https://doi.org/10.1016/s0140-6736(17)32366-8.

[3] H. N. Gouda, F. Charlson, K. Sorsdahl, S. Ahmadzada, A. J. Ferrari, H. Erskine, J. Leung, D. Santamauro, C. Lund, L. N. Aminde, B. M. Mayosi, A. P. Kengne, M. Harris, T. Achoki, C. S. Wiysonge, D. J. Stein, and H. Whiteford. Burden of non-communicable diseases in sub-Saharan Africa, 1990–2017: Results from the Global Burden of Disease Study 2017. *The Lancet Global Health*, 7(10): e1375–e1387, 2019.

[4] A. Ezeh, O. Oyebode, D. Satterthwaite, Y.-F. Chen, R. Ndugwa, J. Sartori, B. Mberu, G. J. Melendez-Torres, T. Haregu, S. I. Watson, W. Caiaffa, A. Capon, and R. J. Lilford. The history, geography, and sociology of slums and the health problems of people who live in slums. *The Lancet*, 389(10068):547–558, 2017.

[5] M.-P. Kieny, H. Bekedam, D. Dovlo, J. Fitzgerald, J. Habicht, G. Harrison, H. Kluge, V. Lin, N. Menabde, Z. Mirza, S. Siddiqi, and P. Travis. Strengthening health systems for universal health coverage and sustainable development. *Bulletin of the World Health Organization*, 95(7):537–539, 2017.

[6] M. D. Kassa and J. M. Grace. Noncommunicable diseases prevention policies and their implementation in Africa: A systematic review. *Public Health Reviews*, 42:1604310, 2022. URL https://doi.org/10.3389/phrs.2021.1604310.

[7] D. Adeloye, E. O. Owolabi, D. B. Ojji, A. Auta, M. T. Dewan, T. O. Olanrewaju, O. S. Ogah, C. Omoyele, N. Ezeigwe, R. G. Mpazanje, M. A. Gadanya, E. Agogo, W. Alemu, A. O. Adebiyi, and M. O. Harhay. Prevalence, awareness, treatment, and control of hypertension in Nigeria in 1995 and 2020: A systematic analysis of current evidence. *The Journal of Clinical Hypertension*, 23(5):963–977, 2021. URL https://doi.org/10.1111/jch.14220.

[8] M. Ezejimofor, O. A. Uthman, Y.-F. Chen, B. Ezejimofor, A. Ezeabasili, S. Stranges, and N.-B. Kandala. Magnitude and pattern of hypertension in the Niger Delta: A systematic review and meta-analysis of community-based studies. *Journal of Global Health*, 8(1): 010420, 2018.

[9] E. I. Okpetu, S. Abimbola, J. A. R. Koot, and S. Kane. Implementing prevention interventions for non-communicable diseases within the primary health care system in the Federal Capital Territory, Nigeria. *Journal of Community Medicine and Primary Health Care*, 30 (1):1–18, 2018.

[10] G. Jeet, J. S. Thakur, S. Prinja, and M. Singh. Community health workers for non-communicable diseases prevention and control in developing countries: Evidence and implications. *PLOS ONE*, 12(7):e0180640, 2017. URL https://doi.org/10.1371/journal.pone.0180640.

[11] R. Ndejjo, H. Y. Hassen, R. K. Wanyenze, D. Musoke, F. Nuwaha, S. Abrams, H. Bastiaens, and G. Musinguzi. Community-based interventions for cardiovascular disease prevention in low- and middle-income countries: A systematic review. *Public Health Reviews*, 42:1604018, 2021. URL https://doi.org/10.3389/phrs.2021.1604018.

[12] T. O. Kolawole, A. Y. Mustapha, A. O. Mbata, B. O. Tomoh, A. Y. Forkuo, and M. C. Kelvin-Agwu. Evaluating the effectiveness of community-based health education programs in preventing non-communicable diseases. *Iconic Research and Engineering Journals*, 7 (3):779–794, 2023.

[13] S. Michie, M. M. van Stralen, and R. West. The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science*, 6:42, 2011. URL https://doi.org/10.1186/1748-5908-6-42.

[14] H. Y. Hassen, R. Ndejjo, G. Musinguzi, J.-P. Van Geertruyden, S. Abrams, and H. Bastiaens. Effectiveness of community-based cardiovascular disease prevention interventions to improve physical activity: A systematic review and meta-regression. *Preventive Medicine*, 153:106797, 2021. URL https://doi.org/10.1016/j.ypmed.2021.106797.

[15] F. Ataklte, S. Erqou, S. Kaptoge, B. Taye, J. B. Echouffo-Tcheugui, and A. P. Kengne. Burden of undiagnosed hypertension in sub-Saharan Africa: A systematic review and meta-analysis. *Hypertension*, 65(2):291–298, 2015.

[16] P. K. Anand, H. Tiwari, R. Gupta, C. Meena, and S. S. Mohanty. Effectiveness and challenges of a community based non-communicable diseases (NCDs) screening program. *European Journal of Cardiovascular Medicine*, 15(1):203–209, 2025.

[17] World Health Organization. WHO package of essential noncommunicable (PEN) disease interventions for primary health care, 2020. URL https://www.who.int/publications/i/item/who-package-of-essential-noncommunicable-(pen)-disease-interventions-for-primary-health-care.

[18] G. Ogedegbe, J. Plange-Rhule, J. Gyamfi, W. Chaplin, M. Ntim, K. Apusiga, J. Iwelunmor, K. Y. Awudzi, K. N. Quakyi, J. Mogaverro, K. Khurshid, B. Tayo, and R. Cooper. Health insurance coverage with or without a nurse-led task shifting strategy for hypertension control: A pragmatic cluster randomized trial in Ghana. *PLOS Medicine*, 15(5):e1002561, 2018. URL https://doi.org/10.1371/journal.pmed.1002561.

[19] E. W. Mengesha, T. D. Tesfaye, M. T. Boltena, Z. Birhanu, M. Sudhakar, K. Hassen, K. Kedir, F. Mesfin, E. Hailemeskel, M. Dereje, E. A. Hailegebrel, R. Howe, F. Abebe, Y. Tadesse, E. Girma, F. Wadilo, E. A. Lake, M. T. Guta, B. Damtew, N. Fentahun, et al. Effectiveness of community-based interventions for prevention and control of hypertension in sub-Saharan Africa: A systematic review. *PLOS Global Public Health*, 4(7):e0003459, 2024. URL https://doi.org/10.1371/journal.pgph.0003459.

[20] H. Y. Hassen, R. Ndejjo, J.-P. Van Geertruyden, G. Musinguzi, S. Abrams, and H. Bastiaens. Type and effectiveness of community-based interventions in improving knowledge related to cardiovascular diseases and risk factors: A systematic review. *American Journal of Preventive Cardiology*, 10:100341, 2022. URL https://doi.org/10.1016/j.ajpc.2022.100341.

[21] N. D. Berkman, S. L. Sheridan, K. E. Donahue, D. J. Halpern, and K. Crotty. Low health literacy and health outcomes: An updated systematic review. *Annals of Internal Medicine*, 155(2):97–107, 2011.

[22] K. R. Lorig, D. S. Sobel, P. L. Ritter, D. Laurent, and M. Hobbs. Effect of a self-management program on patients with chronic disease. *Effective Clinical Practice*, 4(6):256–262, 2001.

[23] A. N. Odili, B. S. Chori, B. Danladi, P. C. Nwakile, O. Oduah, M. Abdullaziz, K. Sada, B. Ezeala-Adikaibe, A. Agabna, and B. N. Okeahialam. Prevalence, awareness, treatment and control of hypertension in Nigeria: Data from a nationwide survey 2017. *Global Heart*, 15(1):47, 2020. URL https://doi.org/10.5334/gh.848.

[24] R. Beaglehole, R. Bonita, R. Horton, C. Adams, G. Alleyne, P. Asaria, V. Baugh, H. Bekedam, N. Billo, S. Casswell, M. Cecchini, R. Colagiuri, S. Colagiuri, T. Collins, S. Ebrahim, M. Engelgau, G. Galea, T. Gaziano, R. Geneau, et al. Priority actions for the non-communicable disease crisis. *The Lancet*, 377(9775):1438–1447, 2011. URL https://doi.org/10.1016/s0140-6736(11)60393-0.

[25] J. Iwelunmor, D. Onakomaiya, J. Gyamfi, S. Nyame, K. Apusiga, K. Adjei, K. Mantey, J. Plange-Rhule, K. P. Asante, and G. Ogedegbe. Adopting task-shifting strategies for hypertension control in Ghana: Insights from a realist synthesis of stakeholder perceptions. *Global Heart*, 14(2):119–127, 2019. URL https://doi.org/10.1016/j.gheart.2019.05.007.