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EFFECT OF COMMUNITY-BASED HEALTH EDUCATION PROGRAM ON KNOWLEDGE AND PERCEPTION OF PHYSICAL ACTIVITIES AMONG PRE-DIABETIC OLDER ADULTS IN SELECTED LGAs IN OGUN STATE, NIGERIA

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ABSTRACT: *Background: Physical activity is an established strategy for diabetes prevention. The incidence of diabetes is inversely proportional to participation in physical activity. An increase in elderly population and shifts in lifestyle have led to a higher prevalence of diabetes mellitus among older adults. One of the most important aspects of physical fitness is its relationship with health, and in this context it can be understood as a demonstration of skills that are associated with a lower risk of prematurely developing type 2 diabetes diseases. Therefore, this study assessed the effect of community-based health education program on knowledge and perception of physical activities among pre-diabetic older adults in selected local governments in Ogun State, Nigeria. Methodology: The study employed a quasi-experimental design. A sample size of 30 older adults for each group was derived using the Power formula. Two local government areas were randomly selected in Ogun State. Abeokuta was the experimental group (EG) and Ikenne was the control group (CG). A structured validated questionnaire with Cronbach's alpha reliability index ranging from 0.7 to 0.8 was used to collect data. Data was collected at baseline, immediate post-intervention and six weeks follow-up. Data was analysed using descriptive and inferential statistics at 5% level of significance. Results: The analysis of the study revealed significant improvements in both knowledge and perception among the experimental group following the community-based health education intervention. At baseline (P0), the mean knowledge scores were 3.77 ± 1.87 for the experimental group and 2.07 ± 1.23 for the control group, indicating no significant difference. However, post-intervention assessments demonstrated marked increases in knowledge for the experimental group, with mean scores rising to 5.50 ± 0.94 immediately after intervention (P1) and 6.93 ± 0.25 at the 12th-week follow-up (P2), compared to the control group whose scores remained relatively unchanged (P1: 2.11 ± 1.26; P2: 2.00 ± 1.31). Similarly, perception scores improved significantly in the experimental group from 54.28 ± 1.53 at baseline to 56.13 ± 2.08 at P1 and 57.17 ± 3.83 at P2, while the control group showed negligible changes (P1: 53.80 ± 2.17; P2: 53.37 ± 3.52). The statistical analysis confirmed significant differences ($p < 0.05$) in knowledge and perception between the groups at both P1 and P2, underscoring the effectiveness of the health education program in enhancing the understanding and favorable perceptions of physical activity among prediabetic older adults. Conclusion: The implementation of an educational intervention program has the potential to increase the knowledge and perception towards physical activities among older adults due to the intervention program. As a consequence, the educational intervention program had a significant impact on the level of knowledge and perception towards physical activities with a very large margin.*

KEYWORDS: Intervention program, health education, pre-diabetic, older adults, physical activity.

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INTRODUCTION

Physical activity is an established strategy for diabetes prevention. The incidence of diabetes is inversely proportional to participation in physical activity. An increase in elderly population and shifts in lifestyle have led to a higher prevalence of diabetes mellitus among older adults (Strain et al., 2018). Presently, older adults, particularly those between 60-79 years old, experience a high rate of T2DM, with close to half of patients being 65 years or older (Bellary et al., 2021). Physical fitness is the ability to perform daily life tasks effectively and without fatigue, and includes a variety of components, such as aerobic fitness, muscle strength, flexibility, agility and balance (Caspersen, 2021). One of the most important aspects of physical fitness is its relationship with health, and in this context, it can be understood as a demonstration of skills that are associated with a lower risk of prematurely developing type 2 diabetes diseases.

Diabetes is on the rise, particularly in urban areas. Studies show that 4.5% of adults in SSA are living with diabetes, representing 24 million individuals, with significant variations across regions (Motala et al., 2022). The prevalence is driven by rapid urbanization, lifestyle changes, and an increasing shift from infectious to non-communicable diseases in these regions. However, research gaps exist due to inconsistent methodologies, leading to challenges in assessing the full scope of the diabetes epidemic in Africa (Gouda et al., 2019).

Physical activity can also lead to improvement in cardiovascular risk factors. With regards to hypertension, there is an inverse relationship between blood pressure and physical activity level, with greater responses noted in those with hypertension/pre-hypertension compared to individuals with normal blood pressure (Edwards & Weiman, 2023). Diabetes is associated with low levels of physical fitness, and people with this chronic disease have lower exercise tolerance than people without diabetes (Reusch et al., 2013). High levels of physical inactivity, overweight and obesity, poor glycemic control, history of cardiovascular disease, insulin resistance, endothelial dysfunction, impaired myocardial perfusion, changes in mitochondrial functions, and medication with influence on cardiovascular response to exercise appear to be at the base of these differences (Erdogan et al., 2020). Physical fitness, in particular, aerobic fitness, is a strong predictor of cardiovascular events, and is inversely related to cardiovascular mortality and mortality from all causes in people to prevent type 2 diabetes (Tanaka et al., 2019).

In Nigeria, diabetes has become a public health challenge. The country has experienced a demographic shift in the epidemiology of diabetes, with a growing prevalence in regions that were previously unaffected. The pooled prevalence of diabetes mellitus in Nigeria stands at 5.77%, affecting over 11.2 million people (Uloko et al., 2018). Among these cases, diabetes accounts for over 90%. Nigeria's south-south region records the highest prevalence rates, while the north-western region reports the lowest rates. This geographic variation highlights the complex nature of diabetes epidemiology in the country, influenced by physical inactivity, lifestyle, socioeconomic status, and access to health care. (Al- Worafi, 2023).

In Ogun State, Nigeria, research has shown alarming rates of T2DM, particularly among the elderly population. A study conducted in Abeokuta revealed that 11.4% of the elderly population had diabetes, with obesity, family history, and high blood pressure identified as significant risk factors (Adeniran et al., 2022). Despite these high prevalence rates, physical

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activity was found to be uncommon among the elderly, and many relied on faith and traditional beliefs rather than seeking medical care (Adeniran et al., 2022).

Physical activity is known as a determinant of health and has been recognized as a behavioural risk factor of diabetes among older adults (Bouchard et al. 2022). Physical activity plays a significant role in health, both together and separately. However, there is no data on the prevalence of deaths among older adults directly due to physical inactivity in Nigeria. However, a population prevalence of about one-quarter of all deaths due to physical inactivity-related NCDs is an urgent call to prioritize physical activity as a public health agenda in Nigeria. To scale up effective physical activity interventions against NCDs in Nigeria, there is a need to develop bold initiatives and implement policies that will increase physical activity across all sectors, including transportation, urban planning, sports and recreation, workplaces and schools (Adeniran et al., 2022).

Research has shown alarming rates of diabetes in Ogun State, particularly among the elderly population. A study conducted in Abeokuta revealed that 11.4% of the elderly population had diabetes, with obesity, family history, and high blood pressure identified as significant risk factors (Adeniran et al., 2022). Despite these high prevalence rates, physical activity was found to be uncommon among the elderly, and many relied on faith and traditional beliefs rather than seeking medical care (Adeniran et al., 2022). These findings underscore the need for targeted health education interventions on the need for physical activity among older adults for the prevention of diabetes.

There is a pressing need to address the gaps in knowledge, particularly regarding preventive behaviors such as regular physical activity, and routine medical check-ups. Without targeted interventions, the prevalence of diabetes is expected to rise, leading to an increased burden on healthcare systems and the community at large.

This study explored the effectiveness of community-based health education programs in promoting physical activities among older adults in selected local governments in Ogun State, Nigeria. By focusing on Abeokuta, where the prevalence of diabetes is higher compared to other parts of Ogun State, this study assessed how health education programs can raise awareness, influence behavior change, and ensure physical activity among older adults.

The implementation of an educational intervention program has the potential to increase the knowledge, perception and also encourage physical activity among the elderly for the prevention of diabetes. This study would also provide insight into the reinforcing and enabling factors that motivate older adults to engage in physical activities. The findings of this study can be used as a framework to develop effective health programs aiming at other diseases among the elderly in Nigeria.

By investigating the effect of health education intervention on physical activity for the prevention of type 2 diabetes among the elderly, the study would provide valuable information for preventing diabetes and also develop effective strategies in promoting exercise, regular checkup, and the adoption of healthy lifestyle in the prevention of diabetes.

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METHODOLOGY

Study Design

For this study, a quasi-experimental design was employed, consisting of one experimental group and one control group, to assess the effect of community-based health education program on knowledge and perception of physical activities among pre-diabetic older adults in selected local governments in Ogun State, Nigeria. The choice of a quasi-experimental design is appropriate since the groups were not randomly assigned. This design has proven effective for similar studies as it allows for the identification of a comparison group or time period that closely resembles the treatment group or time period in terms of baseline characteristics. Prior to the intervention, a baseline data was collected from both the control and experimental groups. This was followed by the designed intervention in the experimental group for a period of six (6) weeks, while the control group was given necessary attention but not the designed intervention. An outcome evaluation was carried out in both the control and experimental groups soon after the intervention. Then, at the twelfth (12^{th}) week from the date of the first data, an impact evaluation was carried out in the two groups.

A sample size of 30 older adults for each group was derived using Cochran's formula. Simple random sampling selection was used to select two local government areas in Ogun State, which are Abeokuta South and Ikenne Local Government Areas. This method is appropriate because older adults are at risk of type 2 diabetes. Abeokuta South was selected as the experimental group while Ikenne was the control group. EG was assigned to health education modules on knowledge of physical activity for 1 hour once weekly and CG had training on exercise for 1 hour once a week, both for six weeks. A total of three research assistants were trained to this effect.

Research Instrument and Data Collection

The research method chosen for this study was quantitative in nature. To create a reliable and valid instrument for data collection, the researcher gathered information from various sources including a review of relevant literature, as well as examining instruments used in similar studies. With this information, an appropriate instrument was developed for use in collecting data from the participants. The instrument was designed to ensure that it aligns with the research objectives and the research questions. The instrument measured respondents' adherence to physical activities among pre-diabetic older adults in selected local governments in Ogun State, Nigeria. The same instrument was administered at the baseline, immediate post intervention and 12-weeks follow up. A structured validated questionnaire with Cronbach's alpha reliability index ranging from 0.74 to 0.81 was used to collect data.

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Table 1: Description of the Data Collection

Groups	Baseline Data	Interventions	Outcome Evaluation (end of intervention program)	Impact Evaluation (at 12th weeks)
Control Group	O	-	O	O
Experimental Group	O	X	O	O

Key: X = Intervention; O = Outcome

Baseline Data Collection

Baseline was the first phase of data collection from the participants. The baseline data served as bases for comparison between the intervention and control. This also served as means of detecting changes attributable to the intervention. Data were obtained from the intervention and control groups with the use of the designed 68-item questionnaire through the interviewer administered by the research assistants recruited for the purpose. The instrument comprised 3 sections that are control variables, independent variables and dependent variables. These variables are demographic characteristics and predisposing factors (knowledge, and perception).

Immediate Post-intervention Data Collection

Immediately after the experimental group received the 6-weeks intervention, the same data collection instrument used for baseline data collection was used to get responses from the intervention and the control group for the second time. The control group received just a 1-day health talk on exercise, not related to the subject matter, as recommended in the principles of ethics that the control group should also benefit from the study (SASLHA, 2011). The variables measured basically were the independent and dependent variables. Socio demographic data were kept throughout the study.

End Line Data Collection

The end line data collection was the third and the last phase of data collection. The end line data was obtained using the same data collection instrument and this was done at the 12th week follow up. Focus was more on the outcome variable which was the knowledge of physical activity.

Study Variables

The independent/treatment variable of the study is health education while the dependent variable is knowledge and perception of physical activity.

Data Analyses

The data collected for the study was collated, entered and coded using the Statistical Product for Service Solutions (SPSS) version 23. The data was cleaned by running a frequency analysis on each item and checking responses to ensure that the values were accurately coded. Data was

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analysed using descriptive and inferential statistics at 5% level of significance. Effect size (ES) was used to measure the magnitude of the intervention in the experimental group.

Ethical Clearance

An application for ethical approval for this study was submitted to the Babcock University Research Ethics Committee. The purpose of the study was explained to all participants, after which, verbal consent was given by each participant, while they also signed the consent forms. All participants were assured of anonymity and the confidentiality of the information received from them.

RESULTS

Socio-demographic Characteristics of the Respondents

Baseline Results Comparison of the Socio-demographic Characteristics of the Respondents among Control and Experimental Groups

Table 2 provides a comprehensive overview of the socio-demographic characteristics of participants in the experimental and control groups at baseline. The mean age of the experimental group was M = 64.30 ± 3.50, while that of the control group was M = 66.30 ± 4.96. Although the control group had a slightly higher mean age, the difference between the groups was not statistically significant (p = 0.501). Regarding gender, males and females were equally distributed in the experimental group (50.0% each), while the control group had a slightly higher proportion of males (56.7%) than females (43.3%). However, the gender distribution between the groups also did not show any significant difference (p = 0.605).

Marital status and religion, however, did not show significant differences between the groups. Married participants constituted the majority in both the experimental group (83.3%) and the control group (76.7%). Divorce and widowhood were slightly more common in the experimental group, while no participants in either group reported being single (p = 0.276). Christianity was the dominant religion across both groups, with 70.0% of the participants in the experimental group and 55.0% in the control group identifying as Christians. A significant proportion of participants in the control group were Muslim (46.7%), but this difference in religious affiliation was not statistically significant (p = 0.184). Overall, while most socio-demographic characteristics were comparable between the groups, significant differences were observed in educational attainment and ethnicity at baseline.

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Table 2: Demographic Characteristics of the Participants in the Study for Each Group at Baseline

Variable	Experimental N=30 N (%)	Control N=30 N (%)	Total N (%)	p-value
Age				
<650	20 (66.7)	13 (43.3)	33 (55.0)	
66-70	9 (30.0)	14 (46.7)	23 (38.3)	
71>	1 (3.3)	3 (10.0)	4 (6.7)	0.501
Mean± SD	**64.30 ± 3.50**	**66.30 ± 4.96**	**65.30 ± 4.37**	
Religion				
Christianity	16 (53.3)	21 (70.0)	37 (61.7)	
Islam	14 (46.7)	9 (30.0)	23 (38.3)	0.184
Others	0 (0.0)	0 (0.0)	0 (0.0)	
Gender				
Male	15 (50.0)	17 (56.7)	32 (53.33)	0.605
Female	15 (50.0)	13 (43.3)	28 (46.67)	
Educational attainment:				
Non-formal	0 (0.0)	11 (36.7)	11 (18.3)	0.000*
Primary	2 (6.67)	2 (6.7)	4 (6.7)	
Secondary	2 (6.67)	14 (46.7)	16 (26.7)	
Tertiary	26 (86.7)	3 (10.0)	29 (48.3)	
Ethnicity				
Yoruba	25 (83.3)	22 (73.3)	47 (78.3)	0.000*
Igbo	5 (16.7)	1 (3.3)	6 (10.0)	
Hausa	0 (0.0)	7 (23.3)	7 (11.7)	
Others	0(0.0)	0 (0.0)	0 (0.0)	
Marital Status				0.276
Married	23 (3.30)	23 (76.7)	46 (76.67)	
Single	0 (0.0)	0 (0.0)	0 (0.0)	
Widow	5 (16.7)	2 (6.7)	7 (11.67)	
Divorced	2 (6.70)	5 (16.7)	7 (11.67)	

-Comparing certain demographic characteristics to demonstrate matched groups at baseline
*Significant at $p<0.05$

Baseline Evaluation of Knowledge and Perception of Physical Activity among Pre-Diabetic Older Adults in Selected Local Government in Ogun State, Nigeria

Table 3 presents the baseline evaluation of personal-level predisposing factors, focusing on the knowledge and perception of physical activity among pre-diabetic older adults in the control and experimental groups. At the pre-intervention phase, the knowledge scores indicated a generally low level of awareness about physical activity. The experimental group had a mean knowledge score of 3.77±1.87, while the control group had a significantly lower mean score

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of 2.07±1.23 on a maximum scale of 9. This difference was statistically significant (t_{58}=4.16, p<0.001), suggesting that the experimental group had a better baseline knowledge level compared to the control group.

In terms of perception, the perceived benefits of physical activity were slightly higher in the experimental group (16.62±0.68) compared to the control group (16.21±0.98), although this difference was not statistically significant (t_{58}=1.87, p=0.066). Similarly, the perceived barriers were notably higher in the experimental group (16.53±0.51) compared to the control group (16.10±0.72), and this difference was statistically significant (t_{58} = 2.72, p = 0.009). Perceived threats were comparable across groups (14.47±0.97) for the experimental group and (14.66±1.32) for the control group with no significant difference (t_{57}=0.63, p=0.533). The self-efficacy scores were also similar between the groups, with the experimental group scoring (6.60±1.43) and the control group scoring (7.0±0.71); the difference was not statistically significant (t_{57}=1.37, p=0.178).

When considering the overall perception of Type 2 diabetes, the total perception scores were 54.28±1.53 for the experimental group and 54.00±0.38 for the control group, with no statistically significant difference (t58=0.59, p=0.559). In summary, the baseline evaluation showed that while the experimental group had significantly higher knowledge scores and perceived barriers, other variables, including perceived benefits, threats, self-efficacy, and total perception of Type 2 diabetes, were not significantly different between the groups. This highlights some similarities in baseline characteristics while also identifying areas of initial variation that could influence the outcomes of the intervention.

Table 3: Independent t-test Statistical Summary of Major Variables for Control and Experimental Groups at Baseline on Personal-level Predisposing Factors of Knowledge and Perception of Physical Activity among Pre-Diabetic Older Adults

Variables	Maximum Points on Scale of Measure	Baseline				
		Experimental Group N=30		Control Group N=30		
		X̄(SE)	±SD	X(SE)	±SD	t (p-value) *
Total Knowledge Low (<3), moderate (4-6), High (7>)	9	3.77(0.34)	1.87	2.07(0.23)	1.23	4.16(<0.001)
Perceived Benefits Low (<7), moderate (8-14), High (15>)	20	16.62(0.13)	0.68	16.21(0.18)	0.98	1.87(0.066)
Perceived Threat Low (<7), moderate (8-14), High (15>)	20	14.47(.18)	.97	14.66(0.25)	1.32	0.63(0.533)

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Perceived Barriers Low (<7), moderate (8-14), High (15>)	20	16.53(.09)	.51	16.10(0.13)	.72	2.72(0.009)
Perceived Self-Efficacy Low (<6), moderate (7-13), High (14>)	16	6.60(.26)	1.43	7.0(0.13)	.71	1.37(0.178)
Total Perceptions About Type 2 Diabetes	76	54.28(0.29)	1.53	54.00 (0.38)	1.96	0.59(0.559)

*** Test of significance for an independent sample t-test between control group (CG) and experimental group (EG)**

Post-intervention Evaluation of Personal-level Predisposing Factors of Knowledge and Perception of Physical Activity among Pre-Diabetic Older Adults in Selected Local Government Areas in Ogun State, Nigeria

Evaluation of Personal-level Predisposing Factors of Knowledge and Perception of Physical Activity among Pre-Diabetic Older Adults for Control and Experimental Groups at 12th Week Follow-up

The table below demonstrates significant differences between the experimental group (EG) and control group (CG) at the 12th-week follow-up across all variables evaluated. These results highlight the effectiveness of the educational intervention program in improving knowledge and perceptions of physical activity among prediabetic older adults in the selected local government areas in Ogun State, Nigeria. The mean knowledge score for the experimental group (6.93 ± 0.25) was significantly higher than the control group (2.00 ± 1.31) on a maximum scale of 9 ($t58=20.21$, $p<0.001$), with an effect size (ES) of 5.31 (95% CI: 5.1–5.6). This suggests a high level of knowledge improvement in the experimental group compared to the control group.

The perception scores also showed substantial differences. Perceived benefits in the EG (18.13 ± 0.51) were significantly higher than the CG (15.27 ± 1.76) on a scale of 20 ($t58=8.57$, $p<0.001$, ES: 2.25). Similarly, perceived threats were higher in the EG (17.63 ± 3.43) compared to the CG (14.67 ± 1.63), with $t58=4.28$, $p<0.001$ and ES: 1.12. Interestingly, perceived barriers were significantly reduced in the EG (6.80 ± 0.55) compared to the CG (16.73 ± 3.23) ($t58=16.62$, $p<0.001$, ES: 4.33), indicating the intervention's success in overcoming barriers to physical activity.

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Table 4: Statistical Summary for Groups at Post-intervention on Personal-level Predisposing Factors of Knowledge and Perception of Physical Activity among Pre-Diabetic Older Adults

		12th week Follow-up					
Variable	**Maximum Points on Scale of Measure**	**Experimental Group N = 30**		**Control Group N = 30**		*ES (95%CI)	t(p-value)*
		⁻X(SE)	±SD	⁻X(SE)	±SD		
Total Knowledge Low (<3), moderate (4-6), High (7>)	9	6.93 (0.46)	0.25	2.00 (0.24)	1.31	5.31 (5.1 to 5.6)	20.21 (<0.001)
Perceived Benefits Low (<7), moderate (8-14), High (15>)	20	18.13 (0.09)	0.51	15.27 (0.32)	1.76	2.25 (1.9 to 2.6)	8.57 (<0.001)
Perceived Threat Low (<7), moderate (8-14), High (15>)	20	17.63 (0.63)	3.43	14.67 (0.30)	1.63	1.12 (0.45 to 1.79)	4.28 (<0.001)
Perceived Barriers Low (<7), moderate (8-14), High (15>)	20	6.80 (0.10)	0.55	16.73 (0.59)	3.23	-4.33 (-4.91 to -3.75)	-16.62 (<0.001)
Perceived Self-efficacy Low (<6), moderate (7-13), High (14>)	16	14.60 (0.12)	0.68	6.70 (0.16)	0.88	10.22 (10.02 to 10.04)	39.11 (<0.001)
Total Perceptions About Type 2 Diabetes	76	57.17 (0.70)	3.83	53.37 (0.64)	3.52	1.05 (0.14 to 1.97)	4.00 (<0.001)

*** Test of significance for an independent sample t-test.**

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Evaluation between Baseline and 12th Week Follow-up Results for the Experimental Group on Personal-level Predisposing Factors of Knowledge and Perception of Physical Activity among Pre-Diabetic Older Adults

The table below evaluates the changes observed in the experimental group across personal-level predisposing factors of knowledge and perception of physical activity among prediabetic older adults between baseline and 12th-week follow-up. The total knowledge score for the experimental group showed a minimal increase from baseline (3.77± 1.8) to 12th-week follow-up (6.9 ± 0.25) on a maximum scale of 9, with significant difference (t27=9.19, p<0.001, ES: 1.99, 95% CI: -2.39 to 1.59). The knowledge level remained high across both time points. Perceived benefits improved significantly, increasing from baseline (16.62 ± 0.68) to follow-up (18 ± 0.52) on a scale of 20 (t28=9.7, p=0.000, ES: 2.51, 95% CI: 2.7 to 2.4). This indicates that participants' perceived benefits of physical activity increased substantially after the intervention.

Table 5: Evaluation of the Effect of the Intervention on Variables at Baseline and 12th Week Follow-up Results for the Experimental Group

VARIABLES	Maximum Points on Scale of Measure	Experimental group					
		Baseline		12th week follow-up			
		X(SE)	±SD	X (SE)	±SD	*ES (95%CI)	t(p-value)
Total Knowledge (N=30) Low (<7), moderate (4-6), High (7>)	9	3.77(.34)	1.87	6.93(.05)	.25	-1.99 (-2.39 to -1.59)	-9.19 (<0.001)
Perceived Benefits(N=30) Low (<7), moderate (8-14), High (15>)	20	16.62(.13)	.68	18.13(.10)	.51	-2.55 (-2.71 to -2.41)	-9.73 (<0.001)
Perceived Threat(N=30) Low (<7), moderate (8-14), High (15>)	20	14.47(.18)	0.97	17.63(.63)	3.43	-1.28 (-1.9 to -0.65)	-4.87 (<0.001)
Perceived Barriers(N=30) Low (<7), moderate (8-14), High (15>)	20	16.53(.09)	.51	6.80(.10)	.55	18.66 (18.5 to 18.79)	71.18 (<0.001)

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Perceived Self-Efficacy(N=30) Low (<6), moderate (7-13), High (14>)	16	6.60(.26)	1.43	14.60(.12)	.68	-7.27 (-7.55 to -6.99)	-27.73 (<0.001)
Total Perceptions About Type 2 Diabetes(N=30)	76	54.28(.29)	1.53	57.17(.70)	3.83	-1.01 (-1.73 to -0.28)	-3.78 (<0.001)

***ES; effect size of post-intervention for control group comparing baseline control group sample mean scores Evaluation from Cohen's D, the corresponding 95% CI; and p-value is level of significance**

DISCUSSION

This study assessed the effect of a Community-Based Health Education Program on knowledge and perception of physical activity among prediabetic older adults in selected local government areas of Ogun State, Nigeria. At baseline, knowledge scores were generally low in both groups. The experimental group (EG) had a mean knowledge score of 3.77 ± 1.87 compared to the control group (CG) with 2.07 ± 1.23. Similarly, perception scores were comparable between the groups at baseline, with EG scoring 54.28 ± 1.53 and CG 54.00 ± 1.96. These findings indicate that prior to the intervention, both groups had limited understanding and appreciation of the importance of physical activity in diabetes prevention.

The lack of significant baseline difference reflects a common trend among older adults in Nigeria, where low health literacy, cultural beliefs, and limited health promotion campaigns contribute to poor knowledge and perceptions of preventive health behaviors (Adeniran et al., 2022). It also aligns with the Health Belief Model, suggesting that perceived susceptibility and perceived benefits were initially low, which could undermine motivation to engage in physical activities.

Following the health education intervention, there was a substantial improvement in the experimental group's knowledge and perception of physical activity. At the immediate post-intervention phase (P1), the EG recorded a mean knowledge score of 5.50 ± 0.94 compared to the CG's 2.11 ± 1.26. At the 12th week follow-up (P2), the EG further improved to 6.93 ± 0.25, while the CG remained low at 2.00 ± 1.31. The improvements in knowledge among the EG were statistically significant at both P1 and P2 ($p < 0.05$), demonstrating the effectiveness of the community-based health education intervention.

Similarly, perception towards physical activities also improved notably in the EG. At P1, the EG scored 56.13 ± 2.08 while the CG remained at 53.80 ± 2.17. By P2, the EG's perception score rose to 57.17 ± 3.83 compared to 53.37 ± 3.52 for the CG. These findings reinforce the assertion that targeted education not only increases knowledge but also positively reshapes attitudes and beliefs about the benefits of physical activity in preventing diabetes among older adults.

The post-intervention improvements validate the theoretical assumptions of the Health Belief Model and the Information-Motivation-Behavioral Skills Model, which posit that enhancing

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information and motivation can significantly influence behavior change. The increases in perception scores suggest that participants internalized the benefits of physical activity and overcame psychological barriers to behavior change after the intervention.

These results are consistent with findings from similar interventions. Lee et al. (2020) and Smith et al. (2022) demonstrated that educational interventions improve both knowledge and perceptions, leading to better preventive health behaviors among high-risk populations. Moreover, the significant post-intervention changes in this study underscore the vital role that culturally tailored, community-based health education plays in fostering health-promoting behaviors among elderly populations in Nigeria.

This study provides strong evidence that a community-based health education intervention significantly improved knowledge and perception towards physical activity among prediabetic older adults. It highlights the critical need to incorporate structured health education into diabetes prevention programs targeting older populations to achieve sustainable behavioral changes.

CONCLUSION

This research highlights the effectiveness of a Community-Based Health Education Program in improving knowledge and perception of physical activity among pre-diabetic older adults in Ogun State, Nigeria. The study revealed that tailored interventions addressing barriers such as low knowledge, negative perceptions, inadequate social support, and lack of access to enabling resources can significantly enhance physical activity adherence in this population. By targeting multiple dimensions, including knowledge and perceptions, the program successfully fostered a supportive environment that encouraged positive behaviour change. The experimental group demonstrated remarkable improvements in knowledge about physical activity and diabetes prevention, a more favourable perception of physical activity, greater motivational support, and better access to physical activity resources. These changes were accompanied by a substantial increase in adherence to physical activity, reflecting the holistic impact of the intervention. The findings underscore the importance of incorporating health education programs into community health strategies, particularly for older adults at risk of chronic conditions such as type 2 diabetes.

RECOMMENDATIONS

1. First, scaling up community-based health education programs is crucial. The success of this intervention demonstrates the value of localized, tailored approaches in addressing the unique needs of pre-diabetic older adults.

2. Strengthening social support systems is essential. The findings highlighted the importance of emotional and reinforcing support in motivating individuals to maintain physical activity.

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3. Increasing access to enabling resources should be prioritized. Local governments and policymakers must collaborate to improve infrastructure, such as safe walking paths, fitness centers, and affordable exercise programs.

4. Integrating physical activity education into primary healthcare systems is recommended. Healthcare providers should receive training on delivering brief physical activity interventions and counseling during routine visits.

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