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EFFECT OF REINFORCING FACTORS ON BLOOD PRESSURE CONTROL: A COMMUNITY-BASED STUDY AMONG NIGERIAN SENIORS IN SELECTED LOCAL GOVERNMENT AREAS IN OGUN STATE, NIGERIA

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ABSTRACT: *Hypertension is a prevalent global health issue, particularly among seniors, contributing to severe health complications such as stroke and heart failure. Despite the availability of effective management strategies, poor adherence to treatment regimens remains a significant challenge. This study investigated the effects of enabling and reinforcing factors on blood pressure control among Nigerian seniors aged 60 years and above. The primary objective was to determine reinforcing factors on blood pressure control Nigerian seniors in selected local government areas in Ogun State, Nigeria. The quasi-experimental design was employed in Abeokuta South and Ikenne Local Government Areas of Ogun State, Nigeria. Fifty hypertensive seniors were randomly assigned to experimental (n = 25) and control (n = 25) groups. The 13-week intervention comprised peer education sessions, health talks, and personalized counselling delivered every four weeks. Descriptive statistics, paired and independent t-tests, and Cohen's d were employed for data analysis, with significance set at $p < 0.05$. Findings revealed significant improvements in reinforcing factors among participants in the experimental group. Post-intervention, adherence scores increased ($M = 14.00$, $SD = 0.91$) compared to the control group ($M = 2.52$, $SD = 4.99$). Conclusively, peer education and counselling interventions significantly enhance reinforcing factors of blood pressure control among Nigerian seniors. It is recommended that community-based health programs incorporate peer-led strategies to improve adherence behaviours. Policymakers should consider integrating such interventions into national healthcare strategies, with emphasis on training peer educators and enhancing healthcare access in underserved communities.*

KEYWORDS: Hypertension, Medication Adherence, Peer Education, Enabling Factors, Reinforcing Factors, Nigerian Seniors, Community-based Intervention.

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INTRODUCTION

Hypertension is a global health concern affecting over 1.3 billion individuals worldwide, contributing to severe complications such as stroke, heart failure, and kidney disease (Zhang et al., 2021). In Nigeria, 30–45% of adults are hypertensive, with rural seniors facing heightened risks due to limited healthcare access (Opreh et al., 2021). Ogun State reflects these national trends, experiencing high rates of hypertension among seniors with significant adherence challenges (Burnier et al., 2020).

Enabling factors such as access to healthcare services and information, and reinforcing factors including peer support, significantly influence adherence to hypertension treatment (Putri et al., 2021). This study, based on the Health Belief Model, Social Cognitive Theory, and the PRECEDE-PROCEED framework, investigates the effectiveness of a structured peer education and counselling program on enhancing medication adherence and blood pressure control among Nigerian seniors.

METHODOLOGY

Study Design: A quasi-experimental design was employed in Abeokuta South and Ikenne Local Government Areas of Ogun State, Nigeria.

Participants: Fifty hypertensive seniors aged 60 years and above were recruited and randomly assigned to an experimental group (n = 25) and a control group (n = 25).

Intervention: The 13-week intervention involved peer education sessions, health talks, and personalized counselling held every four weeks. The control group received standard care.

Data Collection: A 73-item structured questionnaire and sphygmomanometer readings were used to collect data at baseline and post-intervention.

Data Analysis: Data were analyzed using SPSS version 21. Descriptive statistics, independent and paired t-tests, and Cohen's d were used, with significance set at $p < 0.05$.

RESULTS

Table 1: Baseline Characteristics of Participants

Variables	Experimental Group (n=25)	Control Group (n=25)
Age (mean ± SD)	68.4 ± 5.6	67.2 ± 6.1
Gender (Male/Female)	10/15	12/13
Baseline SBP (mmHg)	167.80 ± 9.2	165.50 ± 10.4
Baseline DBP (mmHg)	99.80 ± 5.6	100.20 ± 6.3

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Table 2: Post-Intervention Outcomes

Variables	Experimental Group	Control Group
Adherence Score (mean ± SD)	20.64 ± 2.25	9.64 ± 7.12
Systolic BP (mmHg)	128.24 ± 8.5	164.80 ± 10.1
Diastolic BP (mmHg)	79.56 ± 4.2	98.70 ± 5.4

Reinforcing Factors Measures at Baseline

Reinforcing factors, which measure external influences that support adherence behaviours, were assessed on a 15-point scale. The baseline mean score for the control group was 2.76 (±5.158), while the experimental group had a mean score of 2.60 (±5.180). The independent samples t-test results (t = 0.109, p = 0.913) showed no statistically significant difference between the groups, indicating similar baseline levels of reinforcement from external sources, such as family support and peer influence.

Table 3: Baseline Comparison of Reinforcing Between Control and Experimental Groups

Variables	Maximum Points on Scale of Measure	Control (Baseline) *N*=25		Experimental (Baseline) *N*=25		*P*-value
		X̄(*SE*)	±*SD*	*X̄*(*SE*)	±*SD*	
Reinforcing factors	15	2.76 (1.032)	5.158	2.60 (1.036)	5.180	0.913

Table 3b: Independent t-Test Results for Baseline Comparison Between Control and Experimental Groups

Variables	Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference
	F	*Sig.*	*T*	*df*	*Sig.* (2-tailed)	Mean Difference	Lower
Reinforcing Factors (15-point scale)	0.000	0.992	0.109	48	0.913	0.160	-2.780

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Comparative Analysis of Post-Intervention Changes in Reinforcing Toward Blood Pressure Control

(Follow-Up Control and Follow-Up Experimental)

Reinforcing factors, measured on a 15-point scale, showed a remarkable improvement in the experimental group (M = 14.00, SD = 0.913) compared to the control group (M = 2.52, SD = 4.993). The difference of 11.48 points was highly significant (t (48) = -11.309, $p < 0.001$), indicating that the intervention effectively enhanced social and structural support mechanisms for adherence. The calculated Cohen's d was 3.20 (95% CI: 2.36, 4.04), which is interpreted as a huge effect size (consistent with earlier findings discussed in the report), highlighting the substantial impact of the intervention on reinforcing factors.

Enabling factors, also assessed on a 15-point scale, demonstrated a notable increase in the experimental group (M = 13.64, SD = 1.186) relative to the control group (M = 2.48, SD = 3.177). The difference of 11.16 points was highly significant (t(48) = -16.455, $p < 0.001$), further reinforcing the impact of the intervention in providing necessary resources and support systems for adherence. The corresponding Cohen's d was 4.65 (95% CI: 3.58, 5.71), indicating a huge effect size and underscoring the intervention's effectiveness in strengthening enabling factors.

Overall, these findings highlight the effectiveness of the intervention in significantly improving reinforcing factors towards blood pressure. The observed significant differences between the experimental and control groups suggest that peer education and counselling interventions play a crucial role in enhancing and blood pressure control among hypertensive seniors (Ranjbar et al., 2024) *(See Table 4.3.2).*

Table 4: Comparative Analysis of Post-Intervention Changes in Reinforcing, Toward Blood Pressure Control

(Follow-Up Control and Follow-Up Experimental)

Variables	Group	*N*	Mean ± *SD*	*SE*	*t*	*df*	*Sig.* (2-tailed)	Mean Diff.	*SE* Diff.	95% *CI* (Lower)	95% *CI* (Upper)	*ES* (95% *CI*)
Reinforcing Factors (15)	Control	25	2.52 ± 4.99	1.00	-11.31	48	0.000	-11.48	1.02	-13.52	-9.44	3.20 (2.36 to 4.04) Huge
	Experimental	25	14.00 ± 0.91	0.18								

*Measured on a 15-point scale. *ES (95% CI) represents the effect size of the intervention between control and experimental groups computed using Cohen's d, along with its corresponding 95% confidence interval. The confidence interval provides the range within which the true effect size is expected to fall with 95% certainty. The p-value indicates the significance level for the two-tailed test, where $p < 0.05$ denotes statistical significance. Effect size interpretations follow Cohen's guidelines: Negligible (0–0.19), Small (0.20–0.49), Medium (0.50–0.79), Large (0.80–1.19), Very Large (1.20–1.99), and Huge (≥ 2.00).*

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DISCUSSION

The intervention demonstrated significant improvements in blood pressure control. These findings align with previous studies, such as Burnier et al. (2020), which emphasized the role of social support in improving adherence. The observed improvements in enabling factors, such as increased health literacy and better access to medication, corroborate findings by Putri et al. (2021).

Moreover, the peer-support approach aligns with Social Cognitive Theory, reinforcing the idea that social learning and observation enhance behavioural change (Liddelow et al., 2021). Consistent with Lin and Kishore (2021), the structured social interactions and counselling provided seniors with essential cues to maintain adherence.

Broader literature emphasizes the significance of structured community interventions in chronic disease management. For example, studies by Zhang et al. (2021) highlighted that integrating peer-led interventions into health strategies results in more sustainable outcomes for hypertensive seniors. Similarly, the PRECEDE-PROCEED model supports the necessity of addressing both enabling and reinforcing factors for sustainable health outcomes (Putri et al., 2021).

Policy Implications

- Integration into Primary Healthcare: Policymakers should integrate peer-led education and counselling into Nigeria's primary healthcare framework to enhance medication adherence and hypertension control.
- Training of Peer Educators: A standardized curriculum for training peer educators will ensure consistency and program sustainability.
- Community Engagement: Engaging local communities and stakeholders in intervention programs can foster a sense of ownership and sustainability.
- Healthcare Access Improvement: Addressing barriers to healthcare access, especially in rural areas, will reinforce enabling factors and improve adherence outcomes.

CONCLUSION

This study confirms that a peer education and counselling intervention can significantly enhance blood pressure control among Nigerian seniors. Community-based strategies that incorporate social support mechanisms and improve access to healthcare information are essential for sustainable hypertension management.

The findings advocate for the integration of such interventions into national healthcare strategies, ensuring scalability and sustainability. Moreover, the development of clear policies to train and support peer educators can further strengthen the success of these interventions.

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Ethical Considerations

Ethical approval was obtained from the Ogun State Health Research Ethics Committee. Informed consent was secured from all participants.

Conflict of Interest

The authors declare no conflict of interest.

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