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The Effectiveness of Nutrition Counselling on Diet Compliance in Hypertensive Patients

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Abstract

Low dietary compliance is a major determinant of failure to control blood pressure in hypertensive patients, where conventional educational approaches often fail to bridge the gap between cognitive knowledge and sustained behavioural change. This study aims to assess the effectiveness of interpersonal nutrition counselling as a strategic intervention to improve dietary adherence among hypertensive patients at the Kemumu Community Health Centre. Using a *quasi-experimental* one-group pretest–posttest design, the study involved 45 respondents selected through purposive sampling. Effectiveness was assessed by comparing pre- and post-intervention dietary compliance scores using statistical tests. The analysis showed a statistically significant increase (*p-value* = 0.001). The findings showed a positive shift among all respondents (100%); the dominance of the 'poor' compliance category in the pre-test (68.9%) shifted to the 'fair' and 'good' categories in the post-test, with no stagnation or decline. This study concluded that nutrition counselling emphasising an interpersonal approach significantly improved dietary compliance. Therefore, the integration of intensive nutrition counselling services is highly recommended in the clinical management of hypertension in primary health care facilities.

Keywords: Nutrition counselling, dietary compliance, hypertension, behaviour change, nutrition intervention.

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INTRODUCTION

Hypertension remains one of the leading causes of morbidity and mortality worldwide. The global burden of hypertension remains significant, with reported incidence rates widely recognised as a public health issue and dubbed the silent killer. This disease often does not present with obvious clinical manifestations in its early stages but progressively damages the vascular architecture and

vital organs (Kuntari et al., 2023; Saputra et al., 2023; Widyastuti et al., 2019). Hypertension is a dominant risk factor for catastrophic events such as stroke and myocardial infarction. According to the World Health Organization (WHO), approximately 1.28 billion adults worldwide live with hypertension, and more than 80% of cases occur in low- and middle-income countries (World Health Organization, 2021). The National Health Survey results show that the prevalence of hypertension has tended to increase over the past decade, accompanied by low blood pressure control rates. One of the causes of failure to control hypertension is low patient compliance with healthy eating recommendations (Asia Pacific Solidarity, 2024).

Data from the 2023 Indonesian Health Survey (SKI) shows that the prevalence of hypertension among Indonesians aged 18 years and above is 30.8%, a trend that remains a major problem in society (Kementerian Kesehatan, 2023). This problem is caused by changes in people's lifestyles, including the consumption of foods high in salt and low in fibre, and a sedentary lifestyle (World Health Organization (WHO), 2020). This condition places hypertension not only as an individual clinical problem but also as a significant national health economic burden, considering the high cost of treating its complications (Armiyati et al., 2021; Rahmawati & Latifah, 2020).

Dietary management is a key component in controlling hypertension, as recommended in international guidelines and clinical policies related to healthy diets for hypertension. Hypertension diets have been shown to generally lower blood pressure, and one of the most well-documented approaches is the Dietary Approaches to Stop Hypertension (DASH) diet. Early studies indicate that adherence to the DASH dietary approach can significantly lower systolic blood pressure, with an average reduction of approximately 11 mmHg in several population groups (Bryan & Dewi Saputri, 2024; Yugharyanti et al., 2024). Additionally, the nutrition counseling literature emphasizes that structured educational interventions can improve patient knowledge and mediate behavioral changes that impact blood pressure (Jihad & Murdani, 2024; Rezha et al., 2023).

Clinical management of hypertension requires a treatment paradigm that cannot rely solely on a pharmacological approach. Although antihypertensive drugs play a crucial role in lowering blood pressure, the success of long-term therapy is highly dependent on lifestyle modifications, with adherence to diet playing a central role. Dietary therapy, such as the implementation of a low-salt diet or Dietary Approaches to Stop Hypertension (DASH), has been scientifically proven to significantly lower systolic and diastolic blood pressure (Dafriani et al., 2023; Maharianingsih et al., 2018; Wada et al., 2022). Empirical reality in the field often contradicts clinical theory. Patient adherence to a hypertension diet is noted as one of the most difficult aspects of self-management to

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achieve. Changing eating habits that have been formed over decades, often rooted in culture and taste preferences, is a significant psychological challenge and is associated with high levels of nonadherence, even among patients who have undergone years of treatment (Aba et al., 2023; Maharianingsih et al., 2018).

The concept of nutrition counselling encompasses not only the delivery of information but also the building of trust, the exploration of patient barriers, and the provision of realistic strategies for behavioural change. The quality of communication, the counsellor's skills, and the patient's active involvement play an important role in the success of counselling (Academy of Nutrition & Dietetics, 2017). Dietary adherence in hypertensive patients can be assessed by consistently applying dietary guidelines, such as reducing sodium intake and increasing fruit and vegetable consumption, consistent with the DASH guidelines. The DASH diet has been consistently shown to lower blood pressure, and this effect has been observed across various studies with increased adherence to a healthy hypertension diet. The application of DASH also includes reducing salt intake and increasing fibre, fruit, and vegetable intake, which are widely documented as non-pharmacological strategies for hypertension (Bryan & Dewi Saputri, 2024; Yugharyanti et al., 2024).

A fundamental issue highlighted in this phenomenon is the gap between knowledge and behaviour. Many hypertensive patients have actually been exposed to information about the dangers of salt and saturated fat, but this cognitive understanding does not necessarily translate into consistent compliance (Br Sekali et al., 2022; Diah Purnamayanti et al., 2023). This phenomenon indicates that simply providing one-way health information or education is not sufficient. Previous research has evaluated various educational methods, ranging from leaflet distribution to mass counselling. The majority of these studies conclude that such interventions are effective in increasing knowledge, but often fail to maintain long-term dietary compliance, which indicates that an instructional approach alone ignores the complexity of personal barriers experienced by patients (Setiadi & Martha, 2023).

Attention needs to shift from merely transferring knowledge to more in-depth behavioural interventions, namely, through effective nutrition counselling mechanisms. Within the conceptual framework of this study, the effectiveness of nutrition counselling is a key variable strongly suspected to influence dietary compliance. Unlike regular counselling, nutrition counselling is an interpersonal process involving an intense exchange of information between nutritionists (counsellors) and patients. The concept of "effectiveness" here is not only measured by the duration of the consultation, but also by the quality of the interaction, including empathy, clarity of

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communication, and the counsellor's ability to motivate and build patient self-efficacy (Siswandi et al., 2023).

Research shows that there is a significant gap in the literature on public health and clinical nutrition in Indonesia, with most existing studies tending to focus on the relationship between demographic characteristics and compliance, or comparing the effectiveness of different educational media (Setiadi & Martha, 2023). There is still little research that specifically evaluates patients' perceptions of the quality of the counselling process itself and how these perceptions correlate with their level of diet adherence. This study aims to fill this gap by offering the perspective that the quality of the therapeutic relationship in nutrition counselling is an often-overlooked yet vital determinant of the success of hypertension management.

The novelty of this study lies in its more holistic approach to evaluating the nutrition counselling process. This study aims to identify specific elements of counselling, such as the counsellor's interpersonal communication skills and problem-solving approaches, that most influence patient behaviour change. Thus, this study is expected to change the paradigm of nutrition services from prescriptive to collaborative.

Health system needs indicate that the effectiveness of nutrition counselling is strongly and positively correlated with compliance; therefore, these findings provide a basis for advocating improvements in nutrition service standards in community health centres and hospitals. Scientifically, this study will also enrich the body of knowledge on nutritional psychology and chronic disease management, providing new empirical evidence on the importance of a humanistic approach in clinical services.

Based on the problem background, theoretical review, and identification of existing gaps, this study aims to assess the effectiveness of nutrition counselling on adherence to dietary recommendations among hypertensive patients. Specifically, this study examines the extent to which patients' perceptions of the effectiveness of the counselling they receive, in terms of both information and emotional support, contribute significantly to their adherence to the recommended diet.

METHODOLOGY

Type of Research

This study is a quantitative study with a quasi-experimental design using a *One-Group Pretest-Posttest Design* approach. This design was chosen because it allows researchers to observe changes in diet compliance within the same group before and after receiving a nutritional counselling

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intervention, without forming a control group, which is difficult to achieve in the context of primary health care. This approach allows researchers to assess the effectiveness of the intervention more naturally, in accordance with real-world field conditions, while maintaining the systematic nature of experimental research.

Research Time and Place

The research was conducted from May to July 2024 at the Kemumu Community Health Centre, North Bengkulu Regency. This location was chosen because it has a high number of hypertensive patients and routinely implements non-communicable disease management programs. In addition, the presence of nutritionists engaged in educational activities makes this community health centre a suitable site for implementing nutrition counselling interventions.

Research Objectives (Population and Sample)

The population in this study was all hypertensive patients who made regular visits to the Kemumu Community Health Centre during the study period. The research sample was purposively selected, with participants recruited based on characteristics aligned with the research objectives. Inclusion criteria were patients diagnosed with hypertension by healthcare workers, aged ≥18 years, able to communicate effectively, and willing to complete nutrition counselling. Meanwhile, patients with severe medical complications, cognitive impairment, or undergoing nutritional intervention from other sources were excluded from the sample. Based on these criteria, 45 respondents were deemed eligible and willing to participate in all stages of the study.

Data Collection Techniques and Instrument Development

Data collection was conducted in two stages: initial measurement (pretest) and post-intervention measurement (posttest). Data were obtained using a hypertension diet compliance questionnaire that included behavioural indicators of salt restriction, balanced diet, fruit and vegetable consumption, and other relevant eating behaviours. This instrument was developed based on hypertension diet guidelines and has undergone validity and reliability testing in previous studies. In addition, observation sheets were used to record participant activity during counselling sessions. Nutritional counselling intervention was provided by public health centre nutritionists using interpersonal communication approaches and motivational interviewing techniques to increase patient motivation and readiness to change behaviour.

Data Analysis Techniques

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Data analysis was conducted in two stages: descriptive and inferential. Descriptive statistics were used to characterise the respondents and to describe the distribution of diet compliance scores before and after counselling. Furthermore, to assess the effectiveness of the intervention, inferential statistics were performed using a paired t-test when the data were normally distributed and a Wilcoxon signed-rank test when the data were not normally distributed. This statistical test was selected to determine whether there was a significant difference between pretest and posttest values, thereby explaining whether nutrition counselling had an impact on diet compliance. All analyses were conducted by linking the research results to the research questions and objectives, namely, to assess the effectiveness of nutrition counselling and to quantify the extent of dietary behaviour changes following the intervention.

RESULTS AND DISCUSSION

RESULTS

To understand the impact of nutritional counselling on dietary adherence among hypertensive patients, the first step is to examine the respondents' basic characteristics. These characteristics are an important foundation for assessing the extent to which the intervention can influence groups with different age and gender backgrounds. In addition, the dietary compliance category prior to counselling provides an initial indication of respondents' level of discipline in regulating their eating patterns. Therefore, Table 1 presents the distribution of respondent characteristics and compliance status before and after nutrition counseling.

Table 1. Distribution of Diet Compliance Criteria for Hypertension Patients

Variable / Characteristic	Category	*f*	
Age	Late Adulthood (36-45 years)	5	11.1
	Early elderly (46-55 years old)	22	48.9
	Late elderly (56-65 years old)	17	37.8
	Elderly (> 65 years old)	1	2.2
	Total	45	100
Gender	Male	19	42.2
	Female	26	57.8
	Total	45	100
Diet Compliance (Pre-Test)	Good (Score 76-100)	0	0

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(Before Counseling)	Fair (Score 56-75)	14	31.1
	Insufficient (Score < 56)	31	68.9
	Total	45	100
Diet Compliance (Post-Test)	Good (Score 76-100)	17	37.8
(After Counseling)	Fair (Score 56-75)	28	62.2
	Insufficient (Score < 56)	0	0
	Total	45	100

Table 1 shows that most respondents were in the early to late elderly age range, a group that generally has a higher risk of hypertension complications. The majority of respondents were female. Before counseling, none of the respondents met the good compliance category; most were in the poor category. However, this situation changed dramatically after counseling was provided, with a large number of respondents moving to the adequate category and some others achieving the good category. This change provides initial evidence that counseling intervention may positively affect their dietary behavior. To examine in greater detail how these changes in adherence categories occurred, Table 2 presents the direction of change for each respondent. This data is important for confirming whether the changes observed were widespread or limited to a small subset of participants.

Table 2. Interpretation of the Dynamics of Changes in Diet Compliance Categories

Pattern of Category Change	Direction of Change	*f*	
Insufficient → Adequate	Increasing (+)	28	62.20
Poor → Good	Significantly increased (++)	3	6.70
Fair → Good	Optimal increase (+)	14	31.10
Stable / Declining	Stagnant / Negative (-)	0	0.00
Total		45	100.00

The results in Table 2 indicate that all respondents experienced an increase in compliance, either gradual or pronounced. Most moved from the poor category to the adequate category, while others even improved to the good category. None of the respondents remained stagnant or experienced a decline in compliance. This consistent pattern of change shows that nutrition counseling not only provides knowledge but also helps respondents implement dietary changes in a more focused and tangible way. To reinforce understanding of this pattern of change, Table 3

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specifically shows the number of respondents who moved categories from pre-test to post-test. By examining the movement of categories directly, we can assess the intensity of change within each compliance group.

Table 3. Changes in Compliance Categories (Pre-Test to Post-Test)

Initial Category (Pre)	Became Final Category (Post)	Number of People
Less	Sufficient	31
Enough	Enough	0
Enough	Good	14
Total		45

Table 3 shows that all respondents in the poor category improved to fair, while respondents who were previously in the fair category all improved to good. There was no decline or stagnation at all. These results show a highly consistent pattern, indicating that the counselling provided was effective for all participants to a similar extent. This provides a strong signal that interventions grounded in interpersonal communication and self-motivation can significantly improve dietary adherence. To visually display the difference in scores, Figure 1 presents a graph of the average change in diet compliance scores before and after counselling. This visualisation clarifies the extent of improvement in score levels, not merely in categories.

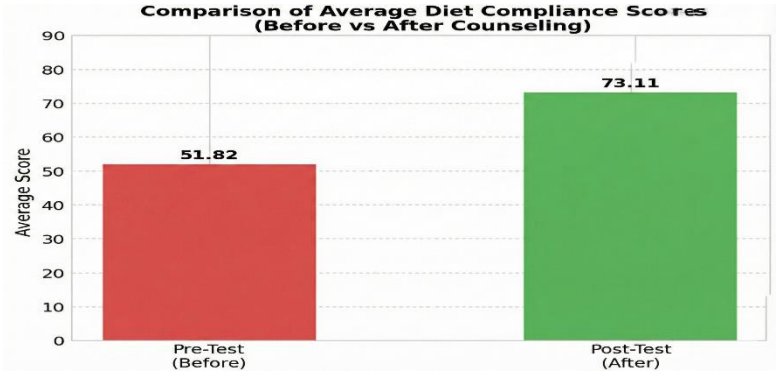

Figure 1. Comparison graph of average diet compliance scores

The figure shows a sharp increase in average scores following counselling. This increase indicates that counselling not only encouraged movement between categories but

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also improved diet compliance among all respondents. The upward-sloping graph clearly shows a strong, targeted, and consistent intervention effect.

Before proceeding to the effectiveness test, researchers need to ensure that the data meet the normality assumption. Therefore, Table 4 presents the results of the Kolmogorov–Smirnov test, which assesses the distribution of the data.

Table 4. Normality Test of Diet Compliance in Hypertensive Patients

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		45
Normal Parameters[a,b]	Mean	.000000
	Std. Deviation	1.30940080
Most Extreme Differences	Absolute	.139
	Positive	.139
	Negative	-.079
Test Statistic		.139
Asymp. Sig. (2-tailed)		.029[c]

The results in Table 4 indicate that the data are not normally distributed, as the p-value is below 0.05. This means that the statistical analysis approach must be adjusted to these conditions, necessitating the use of the Wilcoxon test.

Table 5. Wilcoxon Test for Diet Compliance in Hypertensive Patients

Test Statistics[a]

	Post-Test Score (After Counseling) - Pre-Test Score (Before Counseling)
Z	-5.927[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

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Based on the results of the Wilcoxon Signed-Rank Test, there was a significant difference between pre-test (before counselling) and post-test (after counselling) scores. This was evidenced by a calculated *Z* value of -5.927. The primary indicator of the success of this intervention is the p-value (Asymp.). Sig. (2-tailed), which shows a value of 0.001. Because this significance value is much smaller than the significance level of 0.05 ($p < 0.05$), the null hypothesis (H_0) is rejected, and the alternative hypothesis (Ha) is accepted. Statistically, it can be concluded that the provision of counselling services has a significant effect on changes in respondents' scores. In other words, there is a significant difference in the research subjects' conditions before and after receiving counselling.

DISCUSSION

The results of this study indicate that nutritional counselling has a very strong influence on dietary behaviour change in patients with hypertension. This finding is evident not only in the shift in compliance categories but also in a significant increase in average scores following the intervention. Before receiving counselling, most respondents remained in the low-compliance category. High salt intake and unbalanced eating habits remained major challenges. However, after attending counselling sessions, almost all respondents demonstrated a renewed commitment to adhering to the recommended dietary guidelines. This change indicates that the counselling process, which positions patients as active subjects rather than mere recipients of information, can address their internal motivation.

The changes observed indicate that nutrition counselling not only increases knowledge but also helps respondents understand the rationale for following a diet. Many respondents previously knew that salt was harmful but did not understand the extent of its impact on their blood pressure. Through two-way communication, nutritionists were able to explain information in a more personal and relevant way to patients' daily lives. Warm, empathetic, and clear interpersonal interactions made respondents feel valued, thereby increasing their openness to changing their habits. This is at the heart of the significant changes seen in the research results.

These findings are in line with various studies that emphasise the importance of a counselling approach in influencing the dietary behaviour of people with hypertension. Nutrition counselling plays an important role in improving dietary adherence among individuals with hypertension, consistent with previous literature showing that nutritional education and counselling interventions effectively modify knowledge, attitudes, and eating behaviours, thereby improving adherence to a hypertension diet and lowering blood pressure. Various systematic reviews and empirical studies

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have shown that nutrition education interventions, especially those involving evidence-based dietary approaches such as DASH, as well as the use of educational media (brochures, digital media, text messages), significantly improve dietary compliance and blood pressure outcomes in hypertensive patients (Eka Daryati & Sadiana, 2025; Olpah et al., 2023; Siervo et al., 2014)

Other studies emphasise that the DASH pattern, accompanied by effective nutrition education strategies and the use of modern educational media, has the potential to be the main approach to improve diet compliance and optimise blood pressure control in primary clinical practice and health care facilities (Aprilia et al., 2021; Osamor, 2015; Rinawati & Marasabessy, 2022)

Furthermore, the results of this study have important implications for healthcare services, particularly at the community health centre level. Nutrition counselling should not be viewed as a supplement but rather as an important component of hypertension management. The apparent effectiveness suggests that nutritionists should be given greater space to conduct regular, in-depth counselling. Primary health services can also use these findings to develop more structured diet assistance programs, not only through mass education but also through planned one-on-one communication sessions.

This study presents strong results, but several limitations warrant consideration. The study was conducted in a single location with a small sample size; therefore, the generalizability of the findings remains to be tested in a broader population. In addition, the measurement of diet compliance still relies on self-reports, which may introduce social bias, as respondents may wish to appear compliant. Future studies may consider more objective measurement approaches to strengthen the validity of the data.

Despite these limitations, the findings of this study make an important contribution to the field of nutrition science. This study clarifies that the competence of nutritionists lies not only in their ability to convey information, but also in their ability to build good communication relationships, understand patient barriers, and encourage step-by-step behavioural change. In other words, the success of nutritional interventions depends heavily on interpersonal approaches rather than on educational content alone. These findings enrich the field of nutrition science by highlighting the importance of psychological and social factors, which are as significant as technical knowledge.

The results of this study can serve as a basis for developing a more comprehensive nutrition counselling model, especially for patients with chronic diseases such as hypertension. Effective counselling not only improves short-term diet adherence but also may reduce the risk of future

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serious complications. Therefore, this study not only provides an overview of the effectiveness of an intervention but also underscores the importance of personal assistance as a key pillar of ongoing hypertension management.

CONCLUSION

Nutrition counselling has a real impact on improving dietary compliance in people with hypertension. All respondents experienced an increase in the number of compliance categories and scores after attending counselling sessions, indicating that this intervention not only increased understanding but also encouraged more consistent changes in eating behaviour. This success was influenced by the interpersonal approach used, in which nutritionists not only conveyed information but also helped respondents identify barriers, generate motivation, and build commitment to healthy eating patterns. The consistent improvement indicates that nutrition counselling can be effectively applied across age groups and genders. Statistical test results provide strong evidence that the observed changes were directly attributable to the intervention. Thus, nutrition counselling should be recognised as an integral component of hypertension management in primary health care facilities. These findings are expected to inform the development of a more systematic and sustainable diet assistance program.

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