



TEACH-BACK COMMUNICATION IN HYPERTENSION EDUCATION: EFFECTS ON ADULTS' HEALTH INFORMATION COMPREHENSION

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ABSTRACT. Effective hypertension education requires not only accurate health information but also communication strategies that enable healthcare professionals to verify whether patients have understood the intended message. This study examined the effect of structured teach-back communication on hypertension health-information comprehension among adults. A quasi-experimental pretest-posttest control-group study was conducted at a public health center in Karanganyar Regency, Central Java, Indonesia. A total of 133 adults with hypertension completed the study, comprising 67 participants in the teach-back group and 66 in the standard-communication control group. Both groups received identical standardized hypertension educational content, while the intervention group additionally received a structured explain-ask-listen-assess-clarify-recheck teach-back protocol. Comprehension was measured using the 20-item Hypertension Health Information Comprehension Test (H-HICT). Mean H-HICT scores increased from 10.8 ± 2.4 to 17.1 ± 1.8 in the teach-back group and from 10.6 ± 2.5 to 13.7 ± 2.3 in the control group. After adjustment for baseline comprehension using ANCOVA, the teach-back group achieved significantly higher post-intervention comprehension than the control group, with an adjusted mean difference of 3.2 points (95% CI: 2.5–3.9; $p < .001$; partial $\eta^2 = .39$). Structured teach-back communication was associated with greater immediate comprehension of hypertension-related health information than standard communication. These findings highlight patient reformulation, clarification, and meaning verification as important components of effective health communication in hypertension education.

Keywords: Health Communication, Health Information Comprehension, Hypertension, Patient Education, Teach-Back

ABSTRAK. Edukasi hipertensi yang efektif tidak hanya memerlukan informasi kesehatan yang akurat, tetapi juga strategi komunikasi yang memungkinkan tenaga kesehatan memverifikasi apakah pasien telah memahami pesan yang disampaikan. Penelitian ini bertujuan menganalisis pengaruh komunikasi teach-back terstruktur terhadap pemahaman informasi kesehatan terkait hipertensi pada orang dewasa. Penelitian menggunakan desain kuasi-eksperimental pretest-posttest control group yang dilaksanakan di sebuah puskesmas di Kabupaten Karanganyar, Jawa Tengah, Indonesia. Sebanyak 133 orang dewasa dengan hipertensi menyelesaikan penelitian, terdiri atas 67 peserta pada kelompok teach-back dan 66 peserta pada kelompok kontrol dengan komunikasi standar. Kedua kelompok menerima materi edukasi hipertensi terstandar yang sama, sedangkan kelompok intervensi juga menerima protokol teach-back terstruktur dengan tahapan menjelaskan-bertanya-mendengarkan-menilai-mengklarifikasi-memeriksa kembali. Pemahaman diukur menggunakan Hypertension Health Information Comprehension Test (H-HICT) yang terdiri atas 20 butir. Rerata skor H-HICT meningkat dari $10,8 \pm 2,4$ menjadi $17,1 \pm 1,8$ pada kelompok teach-back dan dari $10,6 \pm 2,5$ menjadi $13,7 \pm 2,3$ pada kelompok kontrol. Setelah dilakukan penyesuaian terhadap pemahaman awal menggunakan ANCOVA, kelompok teach-back menunjukkan pemahaman pascaintervensi yang secara signifikan lebih tinggi dibandingkan kelompok kontrol, dengan perbedaan rerata tersesuaikan sebesar 3,2 poin (95% CI: 2,5–3,9; $p < 0,001$; partial $\eta^2 = 0,39$). Komunikasi teach-back terstruktur berhubungan dengan pemahaman langsung yang lebih baik terhadap informasi kesehatan terkait hipertensi dibandingkan komunikasi standar. Temuan ini menegaskan pentingnya reformulasi pesan oleh pasien, klarifikasi, dan verifikasi makna sebagai komponen komunikasi kesehatan yang efektif dalam edukasi hipertensi.

Kata Kunci: Edukasi Pasien, Hipertensi, Komunikasi Kesehatan, Pemahaman Informasi Kesehatan, Teach-Back

Article History

Submission: 17-09-2026

Revised: 23-09-2026

Accepted: 24-09-2026

Published: 25-09-2026

INTRODUCTION

Hypertension remains a major global health challenge that requires not only effective clinical treatment but also sustained communication between healthcare professionals and patients. The World Health Organization reported that hypertension affects approximately 1.3 billion adults worldwide and remains insufficiently detected, treated, and controlled, particularly in low- and middle-income countries (World Health Organization, 2025). Because hypertension is frequently asymptomatic, adults living with the condition must understand information concerning blood pressure values, medication use, lifestyle modification, self-monitoring, and potential complications even when they do not experience noticeable symptoms. Effective hypertension management therefore depends partly on whether health information is communicated in a form that patients can understand and subsequently apply in everyday health decisions (Rizkasari et al., 2025).

Understanding health information extends beyond simply receiving educational messages. Health literacy encompasses individuals' abilities to access, understand, interpret, appraise, and use health-related information, although definitions and measurement approaches vary considerably across health research (Urstad et al., 2022). In hypertension care, these abilities are particularly relevant because patients routinely encounter numerical blood pressure values, medication instructions, dietary recommendations, risk information, and self-management guidance. A systematic review found that higher health literacy was generally associated with better blood pressure or hypertension knowledge, although associations with behavioral and clinical outcomes were not uniformly consistent (Silva et al., 2022). Similarly, better numerical and overall health literacy has been associated with greater adherence to pharmacological treatment among adults with hypertension (Sayfi et al., 2024). More recent evidence also indicates that health literacy interventions can improve medication adherence, self-efficacy, and blood pressure outcomes among older adults with hypertension (Bralić et al., 2024). Collectively, these findings emphasize that communicating information is insufficient if patients cannot meaningfully comprehend and use the message.

The linguistic characteristics of health communication may further influence comprehension. Health information frequently contains specialized terminology, numerical expressions, unfamiliar concepts, and instructions that require patients to translate clinical language into practical actions. Evidence from health-information research indicates that textual characteristics, including medical jargon and the presentation of numerical information, can

affect the comprehensibility of health instructions, particularly among individuals with limited health literacy (Shersher et al., 2021). Consequently, successful patient education requires more than information transmission; it requires an interactive communication process through which healthcare professionals can determine whether the intended meaning has actually been understood. This distinction is especially important in chronic disease education, where apparent agreement or a simple affirmative response to the question “Do you understand?” does not necessarily demonstrate comprehension.

Teach-back communication provides one approach to addressing this communication problem. In teach-back, healthcare professionals explain health information and subsequently invite patients to restate the essential message in their own words. The patient’s response provides an opportunity to identify incomplete or inaccurate understanding, after which the information can be clarified and comprehension checked again. Importantly, teach-back is intended to assess the clarity of the healthcare professional’s communication rather than to test or judge the patient. A systematic review and thematic synthesis emphasized that operational definitions of teach-back should explicitly frame patient restatement as a means of checking the effectiveness of healthcare-provider communication and identified standardization of the method as important for both research replicability and communication-skills training (M H Jagodage et al., 2024). Thus, teach-back can be conceptualized as an interactive meaning-verification process in which explanation, patient reformulation, feedback, clarification, and rechecking are integrated into the communication encounter.

Recent evidence supports the potential value of this approach across chronic disease contexts. A systematic review of teach-back in chronic kidney disease education found evidence that the strategy can improve knowledge, self-management, and self-efficacy while supporting patients with varying health-literacy abilities (Zare-Kaseb et al., 2024). A systematic review of teach-back implementation similarly concluded that the approach is low risk and can improve self-efficacy and adherence to recommended health behaviors, although uncertainty remains regarding its effects on knowledge and skill acquisition, the durability of its effects, and the settings and populations in which it is most effective (HosseiniFar et al., 2024). These findings suggest that teach-back is promising, but they also demonstrate that its effectiveness should not be assumed to be uniform across health conditions, communication contexts, or outcome measures.

Evidence specifically related to hypertension has begun to emerge. (Roshan-Nejad et al., 2025) evaluated a brief teach-back educational intervention in a medically underserved community and identified substantial baseline gaps in hypertension knowledge. Following teach-back, participants demonstrated marked improvements in correct responses concerning blood pressure information and greater confidence in interpreting blood pressure readings. However, that study involved only 30 predominantly Spanish-speaking participants, used a shortened four-item hypertension knowledge instrument, employed a single-group pre–post approach rather than a contemporaneous comparison group, and focused primarily on hypertension knowledge rather than a multidimensional measure of health-information comprehension (Li et al., 2025). Consequently, although the study provides timely evidence supporting the feasibility of teach-back for hypertension education, further controlled research is needed to determine whether structured teach-back produces greater comprehension than equivalent health information delivered through standard communication.

This distinction between knowledge and health-information comprehension constitutes an important conceptual gap. Knowledge measures commonly assess whether individuals can recall factual information, whereas comprehension requires patients to interpret the meaning of a message and apply it appropriately to a health-related situation. Contemporary health-literacy research has similarly highlighted inconsistencies between broad conceptual definitions of health literacy and narrower instruments that primarily measure basic knowledge or functional skills (Nieto et al., 2026). In hypertension education, an individual may remember that medication should be taken regularly yet still misunderstand whether medication can be discontinued when symptoms disappear; similarly, a patient may recognize the term “blood pressure” without being able to interpret systolic and diastolic values or decide what to do when repeated measurements are above the recommended target. Measuring comprehension therefore provides a more direct assessment of whether the intended health message has been successfully interpreted.

A further gap concerns the communicative mechanism through which teach-back may influence understanding. Much of the clinical literature has examined teach-back as an educational technique and has emphasized downstream outcomes such as disease knowledge, adherence, self-management, readmission, or clinical indicators. From a health-communication perspective, however, teach-back is also a structured linguistic interaction. Patients are required to reconstruct a received message, express its meaning in their own words, receive corrective feedback when misunderstanding occurs, and reformulate their understanding following

clarification. The communication process therefore creates an observable feedback loop between message production and message comprehension. Examining teach-back through this perspective may extend the literature beyond whether health education was delivered toward whether meaning was successfully negotiated and understood between healthcare professionals and patients.

This issue is particularly relevant to primary healthcare settings in Indonesia, where adults with hypertension may differ substantially in educational background, previous exposure to health information, and ability to interpret clinical terminology and numerical health information. A communication strategy that systematically verifies understanding may therefore offer practical value within routine hypertension education. Nevertheless, evidence directly comparing standardized hypertension education delivered with structured teach-back against the same educational content delivered through standard communication remains limited, particularly when the primary outcome is immediate health-information comprehension rather than general disease knowledge or a distal clinical outcome (Aji, Gabriel Ching, et al., 2026).

The present study addresses this gap by examining teach-back as a structured health-communication strategy in hypertension education among adults attending a public health center in Karanganyar Regency, Central Java, Indonesia. Unlike approaches that assess hypertension knowledge alone, the study evaluates comprehension across multiple communication domains, including understanding hypertension, interpreting blood pressure information, medication information, lifestyle recommendations, monitoring and self-management, complication information, and application of health messages to everyday situations. By maintaining equivalent educational content between the intervention and control groups while varying the communication strategy, the study is designed to isolate the contribution of structured teach-back to health-information comprehension (Prima Trisna Aji, Marta Tania Gabriel Ching Cing, 2026).

Accordingly, this study aimed to determine the effect of teach-back communication in hypertension education on adults' health-information comprehension compared with standard health communication. It was hypothesized that, after controlling for baseline comprehension, adults receiving standardized hypertension education through structured teach-back communication would demonstrate higher post-intervention health-information comprehension scores than those receiving the same educational content through standard communication. By focusing on comprehension as the immediate outcome of an interactive

communication process, this study seeks to contribute to the intersection of health communication, applied language use, health literacy, and chronic disease education.

METHOD

This study employed a quasi-experimental pretest-posttest control-group design to examine the effect of structured teach-back communication on adults' comprehension of hypertension-related health information (Sefidkar & Madadizadeh, 2022). The study was conducted at a public health center (Puskesmas) in Karanganyar Regency, Central Java, Indonesia. The intervention group received standardized hypertension education using structured teach-back communication, whereas the control group received the same educational content through standard health communication without structured teach-back. Health-information comprehension was assessed immediately before (T0) and after (T1) the educational session.

The target population comprised adults with hypertension receiving healthcare services at the participating public health center. Participants were eligible if they were aged ≥ 18 years, had a documented diagnosis of hypertension, could communicate in Indonesian and read basic written health information, and provided written informed consent. Exclusion criteria included severe cognitive impairment, acute medical instability, severe hearing or communication difficulties that prevented participation, and previous exposure to the structured teach-back intervention during the study period. Eligible participants were recruited consecutively until the required sample size was achieved.

The sample size calculation was based on the primary outcome of health-information comprehension, assuming a standardized effect size of 0.50, a two-sided α of .05, 80% statistical power, and equal group allocation. The minimum sample was approximately 64 participants per group. Allowing for approximately 10% attrition or incomplete data, 140 participants were recruited, with 70 allocated to each group. Allocation was non-random; therefore, the study was classified as quasi-experimental. To minimize communication contamination, the intervention and control groups were educated during separate service schedules or data-collection periods whenever operationally feasible.

The primary outcome was measured using the Hypertension Health Information Comprehension Test (H-HICT), developed specifically for this study and aligned with the standardized educational content. The instrument consisted of 20 multiple-choice items

covering seven domains: understanding hypertension, blood pressure information, medication information, lifestyle information, monitoring and self-management, complications, and application of hypertension-related information to everyday situations. Each correct response received one point, while incorrect or “do not know” responses received zero points, producing a total score ranging from 0 to 20, with higher scores indicating greater comprehension.

Before the main study, the H-HICT underwent content validation and pilot testing. Seven multidisciplinary experts representing medical-surgical nursing and hypertension care, health education, health communication or health literacy, applied linguistics, research methodology and instrument development, and primary healthcare practice evaluated item relevance, clarity, comprehensibility, representativeness, and alignment with the educational content using a four-point scale. Content validity was evaluated using the Item-Level Content Validity Index (I-CVI) and Scale-Level Content Validity Index/Average (S-CVI/Ave). The revised instrument was subsequently pilot-tested among approximately 30 adults with hypertension who were not included in the main study. Internal consistency was assessed using the Kuder-Richardson Formula 20 (KR-20), together with item difficulty and discrimination analyses.

Sociodemographic and clinical data included age, sex, educational attainment, employment status, duration of hypertension, antihypertensive medication use, previous hypertension education, exposure to hypertension information through digital or social media, and regular home blood pressure monitoring. These variables were collected to characterize the participants and examine potential baseline differences between groups.

Both groups received identical standardized hypertension educational content covering hypertension concepts, interpretation of systolic and diastolic blood pressure, medication use, lifestyle modification, blood pressure monitoring and self-management, complications, and application of hypertension-related information to everyday situations. The content, sequence, and core messages were standardized across groups.

In the intervention group, education was delivered using a structured explain–ask–listen–assess–clarify–recheck teach-back protocol. Information was presented in manageable sections, after which participants were invited to explain key messages in their own words using nonjudgmental prompts. The educator assessed each response as accurate, incomplete, or inaccurate. When misunderstanding was identified, the information was clarified using simpler wording and comprehension was rechecked. Seven standardized teach-back prompts corresponded to the seven educational domains. This procedure operationalized teach-back as

an interactive communication-verification strategy rather than simple repetition of health information (M. H. Jagodage et al., 2024).

The control group received the same educational content, sequence, and comparable educational conditions through standard health communication. Participants could ask questions, but the educator did not systematically request patient restatement, use standardized teach-back prompts, or implement the clarification–recheck cycle. Thus, the educational content was held constant while the communication strategy differed between groups.

Intervention fidelity was supported through standardized educational and communication guides, educator orientation and simulation, and structured fidelity checklists. The intervention checklist documented delivery of standardized content, teach-back prompts, participant restatement, clarification of misunderstandings, comprehension rechecking, completion of educational domains, and session duration. A separate checklist confirmed delivery of the standardized content without structured teach-back in the control group. Session duration was recorded in both groups (Gagnier et al., 2021).

Data collection followed a standardized sequence. After eligibility screening and written informed consent, participants completed the sociodemographic and clinical characteristics form and baseline H-HICT (T0), received the educational procedure corresponding to their study condition, and immediately completed the post-intervention H-HICT (T1). Each participant was assigned a unique study identification code, and withdrawals, incomplete assessments, and protocol deviations were documented (Vet, 2023).

Categorical variables were summarized as frequencies and percentages, while continuous variables were summarized using means and standard deviations or medians and interquartile ranges, as appropriate. The primary analysis used analysis of covariance (ANCOVA), with post-intervention H-HICT score (T1) as the dependent variable, study group as the independent variable, and baseline H-HICT score (T0) as the covariate. Assumptions of linearity, homogeneity of regression slopes, homogeneity of variance, and residual distribution were examined. The intervention effect was reported as the adjusted mean difference with a 95% confidence interval, *p* value, and partial η^2 . Statistical significance was set at a two-sided *p* < .05.

The study was conducted in accordance with established ethical principles for research involving human participants. Ethical approval was obtained from an authorized institutional research ethics committee before recruitment. Participants received written and verbal information regarding the study purpose, procedures, voluntary participation, confidentiality, and right to withdraw without affecting healthcare services. Written informed consent was obtained before data collection, and participant information was coded and securely stored with access restricted to authorized research personnel.

RESULT

A total of 152 adults with hypertension were assessed for eligibility. Twelve individuals were excluded because they did not meet the eligibility criteria or declined participation. A total of 140 participants were therefore enrolled, with 70 participants assigned to the teach-back intervention group and 70 to the standard-communication control group. During the study, three participants in the intervention group and four in the control group did not complete the post-intervention assessment. The final analysis therefore included 133 participants: 67 in the teach-back group and 66 in the control group, corresponding to an overall completion rate of 95.0%.

Prior to the main study, the Hypertension Health Information Comprehension Test (H-HICT) underwent expert content validation and pilot testing. Seven experts evaluated the instrument, standardized educational material, and teach-back protocol. The I-CVI values for the final 20 items ranged from 0.86 to 1.00, while the S-CVI/Ave was 0.94. Fourteen items were retained without modification and six underwent minor wording revisions following expert feedback. Pilot testing among 30 adults with hypertension produced a KR-20 coefficient of 0.82. Item difficulty indices ranged from 0.37 to 0.80, while item-discrimination indices ranged from 0.31 to 0.68. These psychometric findings indicate adequate preliminary content validity and internal consistency of the H-HICT for assessing hypertension health-information comprehension.

Table 1. Participant Characteristics by Study Group

Characteristics	Teach-back group (n = 67)	Control group (n = 66)	p value
Age, years, mean $\pm$ SD	56.2 $\pm$ 9.1	55.7 $\pm$ 9.4	.756
Male, n (%)	29 (43.3)	27 (40.9)	.783
Female, n (%)	38 (56.7)	39 (59.1)	
Educational attainment, n (%)			
Primary or lower	14 (20.9)	15 (22.7)	
Junior secondary	16 (23.9)	17 (25.8)	

Senior secondary	27 (40.3)	25 (37.9)	
Diploma/university	10 (14.9)	9 (13.6)	
Employed, n (%)	35 (52.2)	33 (50.0)	.798
Duration of hypertension, years, mean $\pm$ SD	6.4 $\pm$ 4.2	6.1 $\pm$ 4.0	.674
Antihypertensive medication use, n (%)	63 (94.0)	61 (92.4)	.714
Previous hypertension education, n (%)	39 (58.2)	36 (54.5)	.670
Exposure to digital/social-media hypertension information, n (%)	31 (46.3)	29 (43.9)	.785
Regular home BP monitoring, n (%)	25 (37.3)	23 (34.8)	.766

Note. BP = blood pressure; H-HICT = Hypertension Health Information Comprehension Test; SD = standard deviation.

The demographic and clinical characteristics of the participants are presented in Table 1. The mean age was 56.2 ± 9.1 years in the teach-back group and 55.7 ± 9.4 years in the control group. Women accounted for 56.7% and 59.1% of participants, respectively. The groups also showed comparable distributions of educational attainment, employment status, hypertension duration, antihypertensive medication use, previous hypertension education, exposure to digital health information, and home blood pressure monitoring. Baseline H-HICT scores were 10.8 ± 2.4 in the teach-back group and 10.6 ± 2.5 in the control group ($p = .638$), indicating similar initial levels of hypertension health-information comprehension.

Changes in Health Information Comprehension

Both groups demonstrated higher comprehension scores following hypertension education; however, the magnitude of improvement was substantially greater among participants receiving teach-back communication. Mean H-HICT scores in the teach-back group increased from 10.8 ± 2.4 at baseline to 17.1 ± 1.8 immediately after the intervention, representing a mean increase of 6.3 points (95% CI: 5.7–6.9; $p < .001$). In comparison, the control group increased from 10.6 ± 2.5 to 13.7 ± 2.3 , corresponding to a mean increase of 3.1 points (95% CI: 2.5–3.7; $p < .001$).

Table 2. H-HICT Scores Before and After Hypertension Education

H-HICT outcome	Teach-back group (n = 67)	Control group (n = 66)
T0 baseline, mean $\pm$ SD	10.8 ± 2.4	10.6 ± 2.5
T1 post-intervention, mean $\pm$ SD	17.1 ± 1.8	13.7 ± 2.3
Mean change (T1–T0)	+6.3	+3.1
95% CI for change	5.7–6.9	2.5–3.7
Within-group p value	<.001	<.001

Note. H-HICT scores range from 0 to 20, with higher scores indicating greater hypertension health-information comprehension. CI = confidence interval; SD = standard deviation.

The improvement observed in both groups suggests that exposure to structured hypertension education itself was associated with greater immediate comprehension. Nevertheless, the larger

increase in the teach-back group suggests that the communication process may have provided an additional benefit beyond delivery of the educational content alone. This distinction is important because statistical significance within each group does not demonstrate superiority of one communication approach over another. The primary inference was therefore based on the adjusted between-group analysis.

Effect of Teach-Back Communication on Health Information Comprehension

ANCOVA was performed with post-intervention H-HICT score as the dependent variable, study group as the independent variable, and baseline H-HICT score as a covariate. Examination of model diagnostics indicated no major violation of linearity, homogeneity of regression slopes, or homogeneity of residual variance. After adjustment for baseline comprehension, the estimated post-intervention H-HICT mean was 17.0 (95% CI: 16.6–17.5) for the teach-back group and 13.8 (95% CI: 13.3–14.3) for the control group.

Table 3. ANCOVA of Post-Intervention Health Information Comprehension

Outcome	Teach-back adjusted mean (95% CI)	Control adjusted mean (95% CI)	Adjusted mean difference (95% CI)	p value	Partial η^2
H-HICT T1	17.0 (16.6-17.5)	13.8 (13.3–14.3)	3.2 (2.5–3.9)	<.001	.39

Note. ANCOVA = analysis of covariance; CI = confidence interval; H-HICT = Hypertension Health Information Comprehension Test. Baseline H-HICT score was included as a covariate.

After adjustment for baseline comprehension, participants receiving teach-back communication scored an estimated 3.2 points higher on the 20-point H-HICT than participants receiving standard communication (95% CI: 2.5–3.9; $p < .001$). The partial η^2 of .39 indicated a substantial between-group effect in this analysis. Taken together, these findings support the study hypothesis that structured teach-back communication can produce greater immediate comprehension of hypertension-related health information than the same educational content delivered through standard communication.

Intervention Fidelity and Communication Exposure

Implementation of the teach-back protocol was consistently documented across intervention sessions. Overall protocol fidelity was 94.8%. Participants were asked to restate information in their own words in all 67 intervention sessions, while clarification was required in 49 sessions (73.1%). When clarification was required, comprehension was rechecked in 48 of the 49 applicable sessions (98.0%). The mean educational-session duration was 37.8 ± 5.4 minutes in the teach-back group and 34.6 ± 4.9 minutes in the control group.

Table 4. Implementation of the Teach-Back Communication Protocol

Fidelity indicator	n/N	%
Standardized hypertension content delivered	67/67	100.0
Information divided into manageable sections	65/67	97.0
Participant asked to restate information	67/67	100.0
Nonjudgmental teach-back wording used	64/67	95.5
Participant response assessed	66/67	98.5
Misunderstanding identified when present	49/50	98.0
Clarification provided when required	49/50	98.0
Comprehension rechecked after clarification	48/49	98.0
Seven educational domains completed	65/67	97.0
Standardized prompts implemented	63/67	94.0
Overall protocol fidelity	-	94.8
Session duration, mean $\pm$ SD	37.8 $\pm$ 5.4 min	-

The high fidelity indicates that the intervention was implemented largely in accordance with the predefined protocol. This is particularly important because teach-back should not be reduced to simply repeating educational information. Its defining characteristic is the use of patient restatement to determine whether the healthcare professional has communicated information effectively, followed by clarification and rechecking when misunderstanding is identified (Shersher et al., 2021).

DISCUSSION

The principal finding of this study was that structured teach-back communication produced substantially greater immediate hypertension health-information comprehension than standard communication. Although both groups received identical standardized hypertension educational content and demonstrated improvement in H-HICT scores, the adjusted post-intervention comprehension score was 3.2 points higher in the teach-back group (95% CI: 2.5-3.9; $p < .001$; partial $\eta^2 = .39$). This finding indicates that comprehension may depend not only on the informational content delivered but also on whether patients are actively required to reformulate the message and whether misunderstanding is subsequently identified and clarified.

The present findings are consistent with recent hypertension-specific evidence reported by (Nieto et al., 2026). In their community-based study involving 30 predominantly Spanish-speaking participants, hypertension knowledge improved substantially following a brief teach-back intervention. The median knowledge score increased from 1.0 to 3.0, while correct responses to individual hypertension-knowledge questions increased from 51.7% to 100%, 34.5% to 79.3%, and 27.6% to 93.1%. Participants also reported greater confidence in interpreting blood pressure readings after the intervention. These findings support the potential

value of teach-back for communicating hypertension information. However, the present study extends this evidence in several important respects. Whereas Nieto et al. used a single-group pretest–posttest design, a small sample, and a shortened four-item hypertension knowledge measure, the present study included a contemporaneous control group receiving equivalent educational content and assessed multidimensional health-information comprehension rather than factual knowledge alone.

The findings are also broadly consistent with evidence from other chronic-disease populations. (M H Jagodage et al., 2024), in a systematic review of six studies involving 520 participants with chronic kidney disease, found evidence that teach-back improved self-management, self-efficacy, and knowledge. Importantly, the review characterized teach-back as a structured and cyclical process in which patients explain information in their own words and healthcare professionals repeat or clarify information when understanding is incomplete. The present study demonstrates a similar pattern in hypertension education, but focuses on immediate comprehension as the outcome most proximal to the communication encounter. This distinction is important because improvements in self-management and other behavioral outcomes may depend on multiple influences beyond communication, whereas comprehension directly reflects whether the educational message has been successfully interpreted.

Comparable findings have also been reported in cardiovascular education. (Zare-Kaseb et al., 2024), in a systematic review of teach-back interventions among patients with heart failure, concluded that teach-back-based education can support self-care and patient education. Although heart failure differs clinically from hypertension, both conditions require patients to understand medication instructions, symptom or physiological monitoring, lifestyle recommendations, and actions required when health indicators change. Taken together with the present findings, this evidence suggests that the potential value of teach-back may extend across chronic cardiovascular conditions in which patients must translate complex health information into everyday self-management decisions.

The magnitude and design of the present findings nevertheless require distinction from previous studies. Improvement in both study groups indicates that standardized hypertension education itself contributed to comprehension. The additional improvement observed in the teach-back group should therefore not be interpreted simply as an effect of receiving “more education.” Both groups received the same core messages; the principal difference was the addition of participant reformulation, assessment of understanding, targeted clarification, and

rechecking. This controlled comparison strengthens the interpretation that the observed between-group difference was associated with the communication-verification process rather than merely exposure to hypertension information.

A plausible explanation for this difference is that teach-back externalizes the patient's interpretation of the message. During conventional education, accurate information may be delivered without revealing whether the recipient has interpreted it as intended. Asking participants to reconstruct the message in their own words makes incomplete, inaccurate, or ambiguous interpretations observable. The healthcare professional can then respond to the specific misunderstanding rather than simply repeat the original explanation. Teach-back therefore functions as a communication feedback loop involving message delivery, recipient reformulation, assessment of meaning, clarification, and subsequent verification.

This mechanism is particularly relevant when distinguishing knowledge from comprehension. Hypertension self-management requires patients not only to recall facts but also to interpret and apply information. For example, remembering that antihypertensive medication should be taken regularly does not necessarily mean that a patient understands why treatment should continue when symptoms are absent. Similarly, recognizing the terms systolic and diastolic blood pressure does not demonstrate an ability to interpret repeated blood pressure measurements or determine an appropriate response. The H-HICT therefore included application-based items in addition to direct comprehension items, allowing the present study to examine whether participants could interpret and use health messages rather than merely recall them (Swinkels et al., 2023).

The intervention-fidelity findings provide additional insight into the mechanism. Participant restatement occurred in all intervention sessions, while clarification was required in approximately three quarters of sessions. This finding indicates that misunderstanding or incomplete understanding frequently became observable when participants were explicitly asked to explain the information in their own words. It also supports the cyclical nature of teach-back described by (Qun, 2024), in which clarification and repeated verification are used when initial understanding is incomplete. Nevertheless, the need for clarification should not be interpreted solely as evidence of limited patient health literacy, because misunderstanding may also arise from message complexity, terminology, numerical information, or the way healthcare professionals initially communicate the information (Kim & Lim, 2022).

Implementation feasibility should also be considered. Teach-back sessions in the present study were approximately 3.2 minutes longer on average than standard-communication sessions. This relatively modest difference suggests that structured comprehension verification can be incorporated into a broader educational encounter without disproportionately extending session duration. However, implementation in routine clinical practice may differ from a controlled research setting, particularly where consultation time and staffing are limited. Future implementation studies should therefore examine whether the comprehension benefits observed here can be maintained when teach-back is integrated into shorter routine primary-care encounters.

Language and Health Communication Perspective

Beyond its clinical relevance, the findings have implications for language and health communication. Teach-back creates an interaction in which the healthcare professional produces a health message, the patient reconstructs that message linguistically, and the healthcare professional evaluates whether the reconstructed meaning corresponds with the intended message. When a discrepancy occurs, communication repair is initiated through clarification and subsequent rechecking.

The process can therefore be conceptualized as message production → interpretation → reformulation → feedback → clarification → meaning verification. This differs fundamentally from communication models in which successful delivery is inferred from the absence of patient questions or from affirmative responses to closed questions such as “Do you understand?” Patient reformulation provides observable linguistic evidence of how a health message has been interpreted.

This communication perspective may be especially important in hypertension because patients encounter technical terminology, numerical blood pressure values, medication instructions, risk information, and behavioral recommendations. Health literacy is associated with hypertension-related knowledge, yet relationships with downstream health behaviors and clinical outcomes can be complex and inconsistent (Aji, Tania, et al., 2026). Teach-back does not eliminate these broader determinants; rather, it addresses one proximal component of the problem by enabling communicators to determine whether their immediate message has been understood.

The findings therefore support positioning health-information comprehension as an outcome located close to the communication encounter. Blood pressure control, medication adherence,

and long-term self-management are influenced by numerous biological, behavioral, socioeconomic, healthcare, and environmental factors. Immediate comprehension, by contrast, provides a more proximal indicator of whether the communicative exchange successfully conveyed the intended meaning.

Practical Implications

The findings suggest that structured teach-back could be incorporated into hypertension education in primary healthcare without changing the core educational content. Instead of ending an explanation with a closed question such as “Do you understand?”, healthcare professionals can ask patients to explain what they will do after leaving the consultation or to describe the information in their own words. If the response indicates incomplete understanding, the communicator can clarify the relevant message and verify understanding again.

This approach also changes where responsibility for communication is located. Inaccurate patient restatement should not automatically be interpreted as failure on the part of the patient. Teach-back explicitly frames misunderstanding as a signal that the healthcare professional may need to explain the information differently (Xia & Wang, 2024). Such framing may be particularly useful in primary care populations characterized by variation in educational background, previous exposure to health information, and health-literacy abilities.

The results also have implications for nursing practice. Nurses frequently provide medication instructions, lifestyle education, blood pressure monitoring guidance, and complication-prevention information to adults with hypertension. Integrating teach-back into these encounters could provide an immediate mechanism for determining whether key messages have been understood before the patient leaves the healthcare setting. However, the strategy should complement rather than replace other principles of accessible communication, including clear wording, appropriate information quantity, culturally appropriate examples, and opportunities for questions.

Strengths and Limitations

Several methodological features strengthen the study. First, both groups received the same standardized hypertension content, allowing the communication strategy to constitute the primary planned difference between conditions. Second, teach-back was operationalized through a structured explain–ask–listen–assess–clarify–recheck sequence and standardized

prompts. Third, intervention implementation was documented using a fidelity checklist. Fourth, the H-HICT included application-based items rather than measuring factual recall alone. Finally, ANCOVA was used to compare post-intervention comprehension after accounting for baseline scores, and the intervention effect was expressed using an adjusted mean difference, 95% confidence interval, and effect-size estimate.

Several limitations should also be acknowledged. The quasi-experimental design did not use individual randomization and therefore cannot completely exclude residual confounding. The study was conducted in a single primary healthcare setting in Karanganyar Regency, Central Java, which may limit generalizability to populations with different linguistic, educational, cultural, or healthcare characteristics. The outcome was measured immediately after education; consequently, the findings represent immediate comprehension and cannot establish long-term retention.

A potential testing effect should also be considered because participants completed H-HICT assessments before and after the intervention. Furthermore, the H-HICT was developed specifically for the standardized hypertension material used in this study. Although the validation results indicate satisfactory preliminary content validity and internal consistency, independent validation in other populations would be necessary before broader use. Finally, the study evaluated comprehension rather than downstream outcomes such as medication adherence, self-management behavior, or blood pressure control. Improved immediate comprehension should therefore not be interpreted as evidence that these clinical outcomes necessarily improved.

Future research should examine whether teach-back-related improvements in comprehension persist over longer follow-up periods and whether they subsequently influence self-management behaviors and clinical outcomes. Multicenter research involving populations with different educational and linguistic characteristics would strengthen generalizability. Further language-focused studies could analyze patients' actual reformulations of hypertension messages to identify recurring patterns of misunderstanding, semantic simplification, omission, and communication repair.

Overall, the results support the hypothesis that structured teach-back communication can improve immediate comprehension of hypertension-related health information beyond that achieved through equivalent education delivered using standard communication. More broadly, the findings position teach-back as a process of interactive meaning verification in

which patient reformulation makes comprehension visible and enables misunderstanding to be identified and repaired during the communication encounter.

CONCLUSION

Structured teach-back communication was associated with greater immediate comprehension of hypertension-related health information than standard health communication among adults with hypertension. Despite receiving identical standardized educational content, participants in the teach-back group achieved higher post-intervention comprehension after adjustment for baseline scores, with an adjusted mean difference of 3.2 points (95% CI: 2.5–3.9; $p < .001$; partial $\eta^2 = .39$). These findings suggest that effective hypertension education depends not only on the information delivered but also on how understanding is verified during the communication encounter. The structured explain–ask–listen–assess–clarify–recheck process enabled patients to reformulate health messages in their own words, making misunderstanding observable and allowing clarification before the interaction ended. Thus, teach-back can be conceptualized as an interactive process of meaning verification and communication repair that may strengthen hypertension education in primary healthcare. However, because the study used a quasi-experimental design in a single setting and assessed comprehension immediately after the intervention, the findings should not be interpreted as evidence of long-term retention or improvements in medication adherence, self-management, or blood pressure control. Future multicenter and longitudinal studies should determine whether improvements in comprehension are sustained and translate into behavioral and clinical outcomes.

ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to the Institute for Research and Community Service (LPPM), Universitas Muhammadiyah Semarang, for its support and facilitation throughout the research process. The authors also gratefully acknowledge all individuals and parties who contributed to the successful completion of this study.

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