



Effectiveness of Multimodal Intervention on Health-Related Quality of Life and Treatment Adherence among Hypertensive Patients in Selected Community of Jumla, Nepal

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ABSTRACT

Background: Hypertension remains a major global public health challenge and is associated with poor treatment adherence and reduced health-related quality of life (HRQoL). This study assessed changes in treatment adherence and HRQoL following a multimodal intervention among hypertensive patients in a remote community setting of Nepal.

Methods: A quasi-experimental one-group pretest–posttest study was conducted among 218 hypertensive patients in Chandannath Municipality, Jumla. Participants aged ≥ 18 years, diagnosed with hypertension for at least six months and receiving antihypertensive medication, were recruited through consecutive sampling. Data were collected using the WHOQOL-BREF and the Hill-Bone Compliance to High Blood Pressure Therapy Scale. The multimodal intervention included patient education, counseling, information leaflets, medication boxes, and weekly telephone follow-up for three months. Descriptive statistics and paired t-tests were used for data analysis.

Results: The mean treatment adherence score improved significantly from 19.89 ± 3.54 at baseline to 15.89 ± 2.03 after the intervention ($t = 14.40$, $p < 0.001$). The proportion of participants with perfect adherence increased from 17.9% to 40.8%, while poor adherence decreased from 23.9% to 0%. Similarly, the mean HRQoL score increased significantly from 53.28 ± 11.37 to 62.59 ± 16.27 ($t = -7.00$, $p < 0.001$). The proportion of participants reporting high HRQoL increased from 16.1% at baseline to 23.9% after the intervention.

Conclusions: Significant improvements in treatment adherence and HRQoL were observed following the multimodal intervention. These findings suggest that combining education, counseling, practical adherence tools, and follow-up support may be a feasible strategy for improving hypertension management in resource-limited communities. However, the absence of a comparison group and the short follow-up period limit causal inference and assessment of long-term sustainability.

Key words: hypertension, quality of life, treatment adherence.

BACKGROUND

Hypertension (HTN) is currently the leading contributor to the global burden of non-communicable diseases (NCDs) and mortality (1). HTN is a global public health issue that affects an estimated 1.13 billion people globally, with the majority (two-thirds) residing in low- and middle-income nations. One of the global non communicable disease targets is to lower hypertension

prevalence by 25% between 2010 and 2025 (2).

Hypertension is the leading cause of Cardiovascular Diseases (CVDs) such as coronary artery disease, congestive heart failure, renal insufficiency, peripheral vascular disease, and stroke (3). It is also the major cause of CVD mortality. Indeed, hypertension is responsible for 45% of fatalities from heart disease and 51% of deaths

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from stroke (4). After Africa (27.4%) and the Eastern Mediterranean (26.3%), Southeast Asia (25.1%) has the third highest incidence of hypertension. According to World Health Organization (WHO) estimates from 2015, Nepal ranks third in South Asia in terms of hypertension prevalence (29.4%) (5).

According to the Annual Report of Nepal, in 2075/76 there were 499440 cases of hypertension where, 14840 patients were from Karnali province (5). According to the 2016 Nepal Demographic Health Survey, the prevalence of hypertension in Nepal is 17% among women and 23% among men (6), while the latest STEPS survey found an overall prevalence of 25% (7).

Disease labels and treatment lead to lifestyle modifications that might impair health-related quality of life (HRQoL) and treatment adherence, which is a key concern in the management of hypertension and other chronic diseases nowadays (8). HRQoL is an assessment of a patient's physical, psychological, social, and emotional well-being that is based on a modern concept of healthcare (9).

One of the most common causes of uncontrolled blood pressure in hypertensive individuals is poor adherence to treatment regimens (10). Adherence to hypertension treatment is described as the process through which individuals adhere to their physician's prescribed treatment plan (11).

In spite of the importance of adherence, medication non-adherence is a serious problem, with the World Health Organization (WHO) noting that the average non-adherence rate as 50% among those with chronic illnesses (12). A significant barrier to achieving clinical outcomes, however, is poor medication adherence (13,14), which is associated with increased morbidity, mortality, health care expenditure, and hospital admissions (15).

Drug therapy for hypertension is one of the most cost-effective ways to prevent heart attacks and strokes, but it is dependent on treatment adherence (7).

Nepal is passing through a phase of epidemiological transition from a higher prevalence of communicable diseases to that of non-communicable diseases (NCDs) and is currently suffering from a double burden of diseases (16). The prevalence of NCDs including type hypertension is expected to increase rapidly in the near future (17). Adherence to prescribed medications is one of the key dimensions of health care quality, which is defined as the proportion of prescribed doses of medication actually taken by a patient over a specified period of time (18,19).

Adherence to or compliance with medications has significant economic and therapeutic consequences

because non-adherent patients are at greater risk of developing complications that affect their health status and overall quality of life. With limited studies conducted to investigate this challenging issue, this study aimed to investigate the effects of multimodal interventions on medication adherence and quality of life among hypertensive patients. Specifically, the study sought to measure the effects of multimodal intervention on the health behaviors of hypertensive patients, assess the reach and adoption of the multimodal intervention on treatment adherence and quality of life, evaluate the effects of the multimodal intervention on health-related quality of life, and investigate its effects on treatment adherence among hypertensive patients.

METHODS

A Quasi experimental one group pretest posttest research study design was used to identify the effects of multimodal interventions on health-related quality of life and treatment adherence among hypertensive the patients in selected community of Jumla. The study was carried out in Chandannath municipality, Jumla. This municipality is situated at Karnali province. The populations of this study were known case of hypertension of 18 years and more and who were diagnosed with hypertension for at least 6 months taking at least one hypertensive drug residing, in Chandannath municipality, Jumla.

The required sample for this study was calculated by using the formula for an infinite population. To reduce non response error additional 10% was taken so sample size was 218, calculated based on the prevalence (p) value as 0.83 and a maximum permissible error of 5%. Due to the absence of a sampling frame, the participants who were eligible based on the inclusion criteria on the day of data collection were recruited until the desired sample size was achieved. Inclusion Criteria included:

- Age ≥ 18 years
- Diagnosed with hypertension for at least 6 months
- Taking at least one antihypertensive medication
- Willing to participate

The study employed non-probability consecutive sampling to recruit hypertensive patients who had been diagnosed for at least six months and were on at least one antihypertensive medication. The researcher identified the sample from the community of Chandannath municipality by verbally asking the stated diagnosis, their age and the duration of illness. The medical file of patient was reviewed so as to confirm the information given by the patient.

The semi-structured interview schedules was developed with a guidance of subject experts and after reviewing related literature for the collection of data on socio-

demographic variables, family characteristics and behavioral pattern variables, disease and treatment modalities related variables, and physical symptoms and health status variables. Standardized tool, WHOQOL-BREF and Hill-Bone Compliance to High Blood Pressure Therapy Scale were used to find out the health related quality of life and treatment adherence in hypertensive patients respectively. Permission to use the tool has been obtained from the respective authors. Tool 1 consisted of questions related to the socio-demographic characteristics of the participants; Tool 2 comprised the WHOQOL-BREF questionnaire to assess health-related quality of life; and Tool 3 consisted of the Hill-Bone Compliance to High Blood Pressure Therapy Scale to assess treatment adherence among hypertensive patients.

WHOQOL-Bref is a 26-question instrument developed by the World Health Organization's Quality of Life Group; it is a brief summary of WHOQOL-100. This survey instrument is a structured questionnaire with 26 items divided into four domains: i) physical health, ii) psychological health, iii) social relationships, and iv) environment. Domain scores are scaled in a positive direction (i.e. higher scores denote higher quality of life) (30). The scoring cut off were extracted from the reviewed studies and this was applied in the current study: score ≤ 45 , poor or bad HRQOL; score 46–65, moderate HRQOL; and score > 65 , relatively high HRQOL (22).

The Hill-Bone Compliance to High Blood Pressure Therapy Scale evaluates patient behaviors in three key areas of high blood pressure treatment: 1) reduced sodium intake, 2) appointment keeping, and 3) medication taking. This scale is made up of 14 elements divided into three subscales. Each item is scored on a four-point Likert scale which includes : 9 questions related to medication adherence, 3 questions related to reduced salt intake and 2 questions related to appointment keeping (21). The overall adherence is classified as perfect adherence (if score= 14), (score 15–22 = optimal adherence, score >22 = poor adherence) (23). Two stage back translation of the research instrument was done. The research instrument was pretested among 20 hypertensive patients who met the inclusion criteria from the Sinja municipality of Jumla. The internal consistency of instrument was established by Cronbach' Alpha test where the test results were, WHOQOL-Bref Reliability, Cronbach's alpha: 0.77-0.83 and Hill-Bone Compliance to High Blood Pressure Therapy Scale Reliability, Cronbach's alpha: 0.654 to 0.723. Data was collected after getting ethical clearance from Nepal Health Research Council and approval letter from the office of Chandannath municipality, Jumla. Informed consent was obtained from respondents before interviewing them. The pre-

test data were collected over a one-month period from February 15, 2022, to March 15, 2022, during the day shift. On each data collection day, 7 to 8 respondents were interviewed, with each interview lasting approximately 30 minutes, allowing sufficient time for thorough responses. Following the pre-test phase, the multimodal intervention was implemented in groups of 28 participants, except for the final group, which included 22 participants to complete the total sample size of 218. The intervention was scheduled in four-day cycles, with a new group receiving the intervention every four days while data collection for other participants continued simultaneously. This approach ensured the intervention was delivered efficiently and systematically, while allowing the research team to manage logistics and participant engagement effectively. The post-test data were collected from June 15, 2022, to July 15, 2022, three months after the intervention, to assess the sustained effects of the intervention on participants. The post-test followed the same structured approach as the pre-test to maintain consistency and minimize bias.

The data was analyzed using IBM SPSS version 21 for analysis. Proportion was used to identify reach and adoption of multimodal intervention on treatment adherence and quality of life of hypertensive patients. Paired T test was used to evaluate the effects of multimodal intervention on health-related quality of life and treatment adherence in hypertensive patients.

Implementation of multimodal intervention

The multimodal intervention package was developed through a comprehensive review of relevant literature and consultation with experts in hypertension management and patient education. Key sources included clinical practice guidelines on hypertension, research studies on medication adherence, and behavioral models such as the Health Belief Model and Self-Efficacy Theory, which informed the design of educational and motivational components. The package was also validated by clinical and academic experts prior to implementation to ensure content accuracy and relevance.

During the data collection phase, participants received structured teaching on medication adherence, which included:

- A brief introduction to hypertension.
- Complications of uncontrolled hypertension.
- Dos and don'ts of taking medication.
- Benefits of adherence to prescribed treatment.
- Ill-effects of nonadherence.
- Necessary lifestyle modifications for blood pressure control.

An information leaflet covering all the above points was prepared in the participants' native language

and provided to each participant. To support daily adherence, participants were given a weekly medication box. Additionally, weekly telephonic follow-ups were conducted for three months to remind participants to take their medications, confirm prescription refills, and provide motivation to maintain proper drug-taking behavior.

The intervention was delivered immediately after the first data assessment, ensuring participants received timely education and support. This multimodal approach, combining education, written materials, reminders, and practical tools, was designed to improve medication adherence and promote long-term blood pressure control among participants.

RESULTS

A total of 218 hypertensive patients were included in this quasi-experimental study and completed both the pretest and posttest assessments. The response rate was 100%, with no non-response or loss to follow-up during the study period. The results are presented according to the respondents' socio-demographic characteristics, clinical characteristics, treatment adherence, health-related quality of life, and the effects of the multimodal intervention.

Table 1. Sociodemographic characteristics of the Respondents (n=218)

Sociodemographic Variables	Number	Percentage
Age group (in years)		
≤50	56	25.7
51-60	90	41.3
≥61	72	33.0
Mean±SD 56.14±9.28 Min. : 25, Max.: 88		
Sex		
Male	140	64.2
Female	78	35.8
Education		
Literate	179	82.1
Illiterate	39	17.9
Marital status		
Married	210	96.3
Unmarried	3	1.4
Widow	5	2.3
Employment status		
Employed	127	58.2
Unemployed	91	41.7
Residence		
Urban	89	40.8
Rural	129	59.2

Table 1 presents the socio-demographic characteristics of the 218 respondents. The largest proportion of respondents (41.3%) were aged 51–60 years, followed by those aged 61 years and above (33.0%), while 25.7% were aged 50 years or younger. Nearly two-thirds of the respondents were male (64.2%), whereas 35.8% were female.

Most respondents were literate (82.1%), while 17.9% were illiterate. Almost all respondents were married (96.3%), with only 2.3% widowed and 1.4% unmarried. More than half of the respondents were employed (58.2%), whereas 41.7% were unemployed. Regarding place of residence, the majority (59.2%) lived in rural areas, while 40.8% resided in urban areas.

Table 2. Distribution of the Respondents according to Clinical Characteristics (n=218)

Clinical Characteristics	Number	Percentage
Duration of Disease (in years)		
<5	136	62.4
≥5	82	37.6
Duration of taking medicine		
<24 months	116	53.2
≥ 24 months	102	46.8
Comorbidity		
Yes	17	7.8
No	201	92.2
Number of medicine taken		
One	135	61.9
≥ Two	83	38.1
Blood Pressure (Before Intervention)		
Controlled Blood pressure (<140/90 mmHg)	141	64.6
Uncontrolled Blood Pressure (≥140/90 mmHg)	77	35.6

Table 2 presents the clinical characteristics of the 218 respondents. The majority of respondents (62.4%) had been diagnosed with hypertension for less than 5 years, while 37.6% had a disease duration of 5 years or more. More than half of the respondents (53.2%) had been taking antihypertensive medication for less than 24 months, whereas 46.8% had been on treatment for 24 months or longer.

Regarding comorbidity status, the majority of respondents (92.2%) reported having no comorbid conditions, while only 7.8% had one or more comorbidities. In terms of medication use, 61.9% of respondents were taking one antihypertensive medication, whereas 38.1% were taking two medications.

Concerning blood pressure status, nearly two-thirds of the respondents (64.6%) had controlled blood pressure (<140/90 mmHg), while 35.3% had uncontrolled blood pressure (≥140/90 mmHg).

Table 3. Comparison of Pre-test and Post-test Mean Scores of Treatment Adherence and Health-Related Quality of Life

Variable	Pre-test Mean $\pm$ SD	Post-test Mean $\pm$ SD	Mean Difference	Paired t-values	p-value
Treatment Adherence Score	19.89 $\pm$ 3.54	15.89 $\pm$ 2.03	4.00	14.40	<0.001
Health-Related Quality of Life Score	53.28 $\pm$ 11.37	62.59 $\pm$ 16.27	-9.31	-7.00	<0.001

Table 3 depicts the comparison of pre-test and post-test mean scores of treatment adherence and health related quality of life which showed the multimodal intervention significantly improved treatment adherence and health-related quality of life among respondents. Treatment adherence scores decreased from 19.89 ± 3.54 to 15.89 ± 2.03 , indicating improved adherence (lower scores represent better adherence), while HRQoL scores increased from 53.28 ± 11.37 to 62.59 ± 16.27 . Both changes were statistically significant ($p < 0.001$).

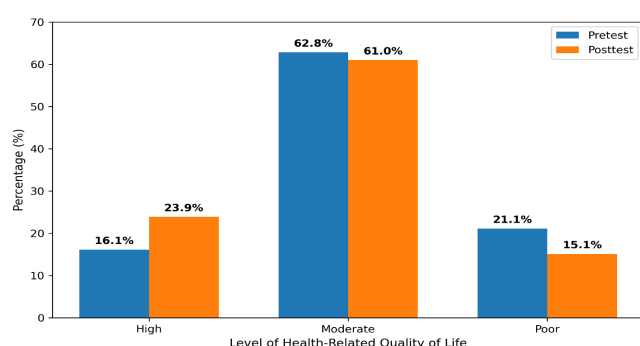
**Figure 1. Impact of multimodal intervention on Health-Related Quality of Life of the Respondents**

Figure 1 depicts the impact of the multimodal intervention on the health-related quality of life (HRQoL) of the respondents by comparing pretest and posttest levels. Following the intervention, the proportion of respondents with high HRQoL increased from 16.1% to 23.9%, indicating a positive shift toward better perceived well-being. Conversely, the proportion of respondents with poor HRQoL decreased from 21.1% in the pretest to 15.1% in the posttest, reflecting an overall improvement in quality of life. Although the moderate HRQoL category showed a slight reduction (from 62.8% to 61.0%), this change likely represents a transition of respondents from moderate to high HRQoL. Overall, the findings suggest that the multimodal intervention had a favorable effect on improving the health-related quality of life of the respondents. The paired t-test was selected because the primary analysis was conducted using continuous scale scores measured among the same participants at two time points. The results showed a significant improvement in overall health-related quality of life ($t = 7.00$, $p < 0.001$) following the intervention.

Table 4. Pretest and Posttest Mean Score of Health-Related Quality-of-Life Subscales of the Respondents (n=218)

Quality of Life Subscales	Total number of items	Pretest Mean $\pm$ SD	Pretest Mean %	Posttest Mean $\pm$ SD	Posttest Mean %	p value
Global Health	1	1.82 $\pm$ 0.8	36.4	1.88 $\pm$ 1.2	37.6	0.571
Physical Health	8	17.27 $\pm$ 4.2	43.1	18.9 $\pm$ 4.8	46.2	<0.001
Psychological Health	6	11.59 $\pm$ 3.3	38.6	15.0 $\pm$ 3.2	50.0	<0.001
Social relationships	3	5.86 $\pm$ 1.9	39.0	6.90 $\pm$ 2.2	46.0	<0.001
Environmental quality of life	8	16.72 $\pm$ 4.7	41.8	19.77 $\pm$ 6.0	49.4	<0.001

Table 4 shows that the mean scores of all health-related quality of life domains increased from pretest to posttest. Significant improvements were observed in the physical health (43.1% to 46.2%), psychological health (38.6% to 50.0%), social relationships (39.0% to 46.0%), and environmental quality of life (41.8% to 49.4%) domains ($p < 0.001$). The psychological health domain showed the greatest improvement. However, the increase in global health score from 36.4% to 37.6% was not statistically significant ($p = 0.571$). These findings indicate that the intervention significantly improved most aspects of quality of life among hypertensive patients.

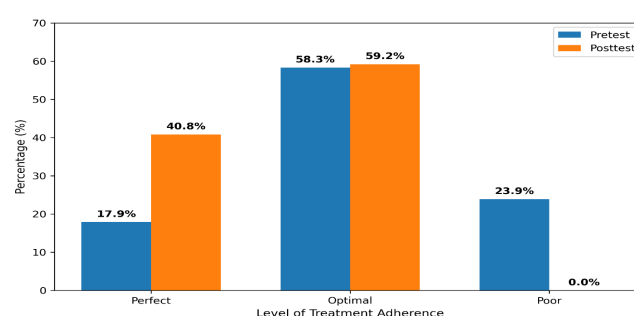
**Figure 2. Impact of multimodal intervention on Level of Treatment Adherence by the Respondents**

Figure 2 illustrates the shift in treatment adherence levels following the multimodal intervention. Before the intervention, only 17.9% of participants demonstrated perfect adherence, whereas this proportion increased markedly to 40.8% in the posttest. Optimal adherence was the most common category both before and after the intervention, increasing slightly from 58.3% to 59.2%. In contrast, poor adherence which was present among 23.9% of respondents at baseline completely disappeared following the intervention (0%).

among the respondents. The findings suggest that the multimodal intervention was successfully adopted by most participants within the study period, reflecting effective engagement, adherence, and implementation at the community level.

The respondents who did not use the interventions reported barriers such as work-related responsibilities, personal commitments, and the severity of illness, which limited their ability to consistently follow the intervention strategies.

Table 5. Comparison of Pre-test and Post-test Mean Scores of Treatment Adherence Subscales

Adherence Subscales	Total Number of Items	Pretest Mean $\pm$ SD	Pretest Mean (%)	Posttest Mean $\pm$ SD	Posttest Mean (%)	p-value
Medication Taking Subscale	9	13.13 $\pm$ 2.78	36.4	10.29 $\pm$ 1.70	28.5	<0.001
Sodium Intake	3	4.06 $\pm$ 0.91	33.8	3.31 $\pm$ 0.50	27.5	<0.001
Appointment Keeping	2	2.68 $\pm$ 0.67	33.5	2.27 $\pm$ 0.40	28.3	<0.001

Table 5 depicts the comparison of pre-test and post-test means scores of treatment adherence subscales which showed mean scores of all treatment adherence subscales significantly decreased from pretest to posttest, indicating improved adherence among respondents. The medication-taking subscale score decreased from 13.13 $\pm$ 2.78 to 10.29 $\pm$ 1.70, sodium intake adherence improved from 4.06 $\pm$ 0.91 to 3.31 $\pm$ 0.50, and appointment-keeping adherence improved from 2.68 $\pm$ 0.67 to 2.27 $\pm$ 0.40. These improvements were statistically significant for all subscales ($p < 0.001$).

According to the Annual Report 2077/2078, a total of 17,612 hypertension cases were reported in the fiscal year 2076/77. Of these, 218 patients were included in the present study, representing a coverage of approximately 1.2% of the total hypertensive population.

DISCUSSION

Hypertension remains one of the leading risk factors for cardiovascular morbidity and mortality worldwide. Effective blood pressure control depends largely on long-term adherence to prescribed treatment and healthy lifestyle behaviors. The present study assessed changes in treatment adherence and health-related quality of life (HRQoL) following the implementation of a multimodal intervention among hypertensive patients in a remote community of Nepal.

Treatment Adherence

The findings demonstrated a significant improvement in treatment adherence following the intervention. The proportion of respondents with perfect adherence increased from 17.9% at baseline to 40.8% after three months, while poor adherence decreased from 23.9% to 0%. In addition, the mean adherence score improved significantly from 19.89 $\pm$ 3.54 to 15.89 $\pm$ 2.03 ($p < 0.001$). These findings are consistent with the study by Sheilini et al. (24), which reported improved antihypertensive medication adherence following counseling and coaching interventions.

Several components of the multimodal intervention may have contributed to the observed improvement. Poor provider–patient communication, inadequate knowledge about medications, concerns regarding adverse effects, complex treatment regimens, and financial barriers have been identified as common causes of non-adherence (25). The educational sessions conducted in this study provided individualized information regarding the purpose of treatment, medication schedules, potential side effects, and the importance of long-term adherence. Such patient-centered education can improve understanding and

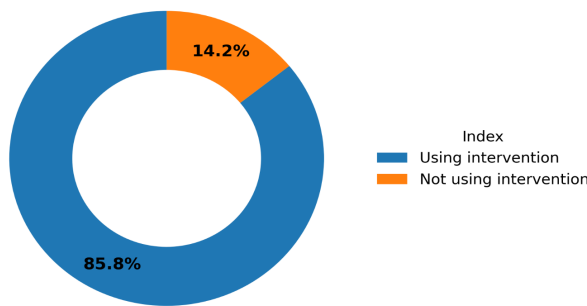


Figure 3. Proportion of Respondents using interventions (After 3 months of intervention)

Figure 3 illustrates the proportion of respondents using the prescribed interventions after three months of implementation. The majority of participants (85.8%) reported using the intervention, while only 14.2% were not using it. This high level of uptake indicates good acceptability and feasibility of the intervention

motivation, enabling patients to make informed decisions about their treatment (26).

The use of information leaflets and medication boxes may also have supported adherence by helping participants integrate medication-taking into their daily routines. Previous studies have shown that medication calendars, pill organizers, and written instructions can improve treatment adherence by simplifying medication management and reducing unintentional non-adherence (26). Furthermore, weekly telephone follow-up likely reinforced adherence behaviors by providing reminders, encouragement, and opportunities to address concerns related to treatment.

Forgetfulness is frequently reported as one of the most common reasons for medication non-adherence, accounting for nearly half of non-intentional non-adherence behaviors in some studies (27). Consistent with the findings of Abdi (28), the telephone follow-up component of the intervention may have helped overcome this barrier by reminding participants to take their medications and refill prescriptions when necessary. These findings support recommendations from the World Health Organization emphasizing the importance of behavioral support and reminder systems to improve adherence among individuals with chronic diseases (13).

Health-Related Quality of Life

The study also found significant improvements in HRQoL following the intervention. The proportion of respondents reporting high HRQoL increased from 16.1% before the intervention to 23.9% after the intervention, while the overall mean HRQoL score increased significantly from 53.28 ± 11.37 to 62.59 ± 16.27 ($p < 0.001$). These findings are comparable to those reported by de Souza et al. (29), who observed improvements in quality of life among hypertensive individuals following educational interventions.

Hypertension and its treatment can affect multiple dimensions of daily life, including physical functioning, emotional well-being, social relationships, and environmental satisfaction (30). In the present study, significant improvements were observed across most HRQoL domains, particularly psychological, social, and environmental health. Improved treatment adherence may have contributed to better symptom control, increased confidence in disease management, and reduced anxiety regarding disease complications, thereby enhancing overall well-being.

Educational and supportive interventions may also empower individuals to take a more active role in managing their health. By increasing knowledge,

promoting healthy lifestyle practices, and strengthening communication between patients and healthcare providers, such interventions can improve self-efficacy and encourage positive health behaviors. These mechanisms may explain the improvements observed in both adherence and HRQoL among the study participants.

Practicality and Cost Considerations in Resource-Limited Settings

An important strength of the intervention is its practicality for implementation in remote and resource-limited settings such as Jumla. The intervention relied on relatively low-cost components, including educational sessions, printed leaflets, medication boxes, and telephone follow-up. These strategies require minimal infrastructure and can be integrated into existing primary healthcare and community health programs. Compared with technology-intensive interventions, the multimodal approach used in this study is affordable and potentially scalable for similar rural communities where access to specialized healthcare services is limited.

However, continued implementation would require sustained engagement from healthcare workers and support from local health authorities. Community health workers and primary healthcare providers may play an important role in delivering such interventions in routine practice.

Limitations and Sustainability of Outcomes

The findings should be interpreted in light of several limitations. First, the study employed a one-group pretest–posttest design without a comparison group. Therefore, although significant improvements were observed following the intervention, it cannot be concluded that the intervention alone caused these changes. Other external factors occurring during the study period may also have influenced the outcomes.

Second, the study was conducted in a single municipality, which may limit the generalizability of the findings to other populations and settings. Third, outcomes were assessed only three months after the intervention. While the short-term results are encouraging, it remains unclear whether the improvements in adherence and HRQoL can be maintained over longer periods. Hypertension requires lifelong management, and adherence behaviors may decline once regular follow-up and reminders are discontinued. Future studies with longer follow-up periods and controlled study designs are needed to determine the sustainability, effectiveness, and cost-effectiveness of multimodal interventions for hypertension management.

The limitation of the study might be the time constraints between intervention and posttest, lack of previous research studies on the topic. The other bias is that the study sample was taken from a single setting.

CONCLUSION

Improvements in treatment adherence and health-related quality of life were observed among hypertensive patients following the multimodal intervention. The findings suggest that combining patient education, behavioral support, reminder systems, and follow-up may be a practical approach for enhancing hypertension management in resource-limited community settings. However, given the absence of a comparison group and the short follow-up period, further controlled studies with longer follow-up are needed to determine the sustainability and effectiveness of these interventions.

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Conflict of Interest

The authors declare no conflict of interest.

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