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EXPLORING PATIENT PERCEPTIONS AND LIFESTYLE EXPERIENCES RELATED TO SALT SENSITIVITY AND ITS IMPACT ON CARDIOVASCULAR HEALTH

Qualitative Study

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ABSTRACT

Background: Salt sensitivity is increasingly recognized as a determinant of cardiovascular risk, yet little is known about how patients perceive this condition and adapt their lifestyles in response. The interplay between cultural practices, dietary behavior, and personal experiences highlights the need to explore patient perspectives in greater depth.

Objective: To qualitatively explore patient perceptions and lifestyle challenges associated with salt sensitivity and its impact on cardiovascular health.

Methods: A qualitative study was conducted over four months in South Punjab with 32 purposively selected adults aged 28–65 years, diagnosed with hypertension or cardiovascular disease. Data were collected using semi-structured interviews, focusing on awareness, lifestyle barriers, coping strategies, and perceived health effects. Thematic analysis was applied to transcripts, supported by descriptive statistics for demographic variables. Normal distribution was verified using the Shapiro–Wilk test.

Results: Mean participant age was 47.3 years, with 56.3% male and 43.7% female. High awareness of salt sensitivity was reported by 31.3%, moderate awareness by 43.8%, and low awareness by 25.0%. Common barriers included taste preference (62.5%), social gatherings (56.3%), and family eating patterns (46.9%). Coping strategies such as substituting herbs and spices (50.0%), gradual reduction (43.8%), and family support (37.5%) were widely reported. Improvements in blood pressure control (43.8%) and overall well-being (25.0%) were the most frequent perceived health benefits.

Conclusion: Patient perceptions revealed significant variability in awareness and adaptation to salt sensitivity. Despite cultural and social barriers, effective coping strategies enabled positive health outcomes. These findings emphasized the need for personalized, culturally sensitive interventions to support sustainable salt reduction and enhance cardiovascular protection.

Keywords: Cardiovascular Diseases, Diet, Hypertension, Life Style, Patient Preference, Qualitative Research, Sodium Chloride, South Asia.

INTRODUCTION

Salt sensitivity has emerged as an important yet underrecognized determinant of cardiovascular health. While excessive dietary sodium intake has long been implicated in hypertension and related complications, it has become increasingly evident that individuals vary considerably in their physiological response to salt (1). For some, blood pressure rises sharply with modest sodium consumption, whereas others appear more resilient. This variability, termed salt sensitivity, carries profound implications for disease risk, therapeutic strategies, and lifestyle guidance (2). Understanding how patients themselves perceive this concept, adapt to dietary recommendations, and manage the social and cultural dimensions of salt reduction is critical for advancing both clinical practice and public health initiatives (3). Cardiovascular diseases remain the leading cause of morbidity and mortality worldwide, with hypertension serving as one of the most significant modifiable risk factors. Despite the well-documented role of sodium in elevating blood pressure, efforts to reduce salt intake often meet with limited success. Part of this challenge lies in the deeply ingrained cultural and behavioral practices surrounding food, as well as in patient perceptions of the risks and benefits of dietary modification. Many patients are aware of broad recommendations to limit salt, yet they may not fully appreciate how their individual sensitivity influences their personal health outcomes. This disconnect underscores the need to explore the lived experiences of those attempting to adhere to salt restriction in real-world contexts (4).

The complexity of salt sensitivity extends beyond biological mechanisms to encompass psychological, social, and cultural dimensions (5). For many, salt is not merely an additive but an integral component of taste, tradition, and daily comfort. Reducing intake may therefore pose challenges that extend into family dynamics, social gatherings, and personal identity (6). Patients navigating these changes often experience frustration, confusion, or ambivalence, especially when lifestyle advice appears generic and disconnected from their individual circumstances. Such experiences can shape adherence patterns and ultimately influence cardiovascular risk trajectories (7). By examining these perspectives qualitatively, valuable insights can be gained into the nuanced challenges that quantitative studies alone may overlook. Previous research has provided important data on the physiological basis of salt sensitivity, highlighting its links with genetic factors, renal function, and vascular responsiveness. However, far less attention has been given to the patient voice—the subjective experiences of individuals grappling with dietary restrictions and their associated lifestyle adjustments. Without this understanding, interventions risk being prescriptive rather than supportive, leaving patients to negotiate barriers with limited guidance. The gap between scientific knowledge and patient realities emphasizes the urgency of incorporating qualitative approaches to better align medical recommendations with lived experiences (8).

Exploring patient perceptions also offers opportunities to identify unrecognized facilitators of successful adaptation (9). Some individuals may develop creative strategies to maintain flavor while reducing sodium, while others may find motivation in social support networks or in noticeable improvements in their health (10). Capturing these narratives can enrich clinical counseling, inform culturally sensitive dietary guidelines, and inspire public health campaigns that resonate more authentically with diverse populations (11). Moreover, qualitative insights can help clinicians appreciate the emotional and social burdens associated with dietary change, encouraging more empathetic and personalized approaches to care. This study seeks to address these gaps by qualitatively exploring patient perspectives and lifestyle challenges related to salt sensitivity and its cardiovascular health implications. By listening to and analyzing these experiences, it aims to provide a deeper understanding of how individuals perceive salt sensitivity, how they interpret its impact on their health, and how they navigate the often difficult process of dietary modification (12). The objective is to generate insights that not only illuminate patient struggles but also identify pathways toward more effective, compassionate, and practical strategies for cardiovascular risk reduction.

METHODS

The present study was conducted using a qualitative research design to gain an in-depth understanding of patient perspectives and lifestyle experiences related to salt sensitivity and its cardiovascular implications. The study was carried out over a period of four months in South Punjab, where participants were purposively recruited from outpatient cardiology and internal medicine clinics. A purposive sampling approach was adopted to ensure that participants represented a diverse range of age groups, genders, and socio-economic backgrounds, thereby allowing a richer exploration of perceptions and lifestyle adaptations. Eligibility criteria required that participants be adults between the ages of 25 and 65 years with a clinical diagnosis of hypertension or cardiovascular disease in whom salt sensitivity had been identified either through physician advice or prior dietary counseling. Individuals with cognitive impairment, psychiatric illness, or severe comorbidities that limited effective communication were excluded, as were those unwilling to participate in in-depth

interviews. Based on thematic saturation principles, a sample size of 32 participants was determined to be adequate. This size was calculated by considering that thematic saturation in qualitative studies is often achieved between 20 and 30 interviews, with an additional buffer included to ensure completeness and variation of perspectives.

Data collection was carried out using semi-structured, in-depth interviews that allowed participants to express their experiences in their own words, while also enabling the researcher to guide the conversation toward key themes relevant to salt sensitivity and cardiovascular health. An interview guide was developed, comprising open-ended questions covering knowledge of salt sensitivity, perceived impact on cardiovascular well-being, challenges in dietary adjustment, coping strategies, and emotional or social implications. Probing questions were used to encourage participants to elaborate on their experiences, while flexibility was maintained to capture unanticipated themes. Each interview lasted approximately 30 to 45 minutes and was audio-recorded with participant consent, then transcribed verbatim for analysis. To enhance the reliability of the findings, transcripts were cross-checked with field notes that captured non-verbal cues, participant emphasis, and contextual details. Data analysis followed a thematic framework approach, combining inductive and deductive coding. Initial coding was carried out manually by two independent researchers who read and re-read the transcripts to familiarize themselves with the data. Codes were then grouped into categories and refined into broader themes through constant comparison, allowing for the emergence of recurrent patterns as well as unique individual experiences. The credibility of the findings was ensured through investigator triangulation, as both coders independently developed coding schemes that were subsequently reconciled through consensus discussions.

Although qualitative studies traditionally emphasize narrative interpretation rather than statistical analysis, descriptive statistics were applied to the demographic data of participants. Means and standard deviations were calculated for continuous variables such as age and duration of hypertension, while categorical variables such as gender, educational status, and occupation were summarized using frequencies and percentages. For consistency and transparency, normal distribution of continuous variables was verified using the Shapiro–Wilk test. These descriptive analyses provided context for the qualitative narratives and ensured that participant characteristics were appropriately represented. The primary outcome measurement tools were the semi-structured interview guide and thematic analysis framework, which enabled systematic exploration of the research objective. Thematic saturation was considered the key outcome marker, indicating that sufficient data had been collected to capture the breadth of patient experiences. Through this methodological approach, the study ensured rigor, transparency, and replicability, while preserving the authenticity of participant voices in exploring the intersection of salt sensitivity, lifestyle practices, and cardiovascular health.

RESULTS

A total of 32 participants were included in the study, with a mean age of 47.3 years (range 28–65). The sample comprised 18 males (56.3%) and 14 females (43.7%). The average duration of hypertension was 8.6 years. Most participants resided in urban settings (65.6%), while the remainder came from rural areas (34.4%). These demographic characteristics are summarized in Table 1 (see attached Word file).

Awareness regarding salt sensitivity varied across participants. Ten individuals (31.3%) demonstrated high awareness, primarily reporting a clear understanding of its relationship to blood pressure and cardiovascular risk. Fourteen participants (43.8%) exhibited moderate awareness, generally acknowledging the risks but with limited detail. Eight participants (25.0%) had low awareness and were uncertain about salt's specific contribution to cardiovascular disease. Awareness levels are illustrated in Table 2 and in the pie chart (Figure 1).

Challenges in adhering to reduced-salt diets were widely reported. The most common barrier was difficulty adjusting to reduced taste intensity, cited by 20 participants (62.5%). Eighteen participants (56.3%) described pressure during social gatherings as a major challenge, while 15 (46.9%) highlighted the influence of family eating habits. Limited food choices (37.5%) and lack of medical guidance (31.3%) were also prominent barriers. These findings are presented in Table 3 and the bar chart (Figure 2).

Participants employed several coping strategies to address these challenges. Sixteen participants (50.0%) reported substituting herbs and spices to maintain food palatability. Fourteen (43.8%) adopted gradual reduction of salt over time, while 12 (37.5%) emphasized support from family members as a key facilitator. Cooking separate meals for hypertensive members was mentioned by 10 (31.3%), and nine (28.1%) expressed improved health awareness as a motivator for compliance. These strategies are summarized in Table 4.

Perceptions of the impact of salt reduction on cardiovascular health varied. Fourteen participants (43.8%) reported noticeable improvements in blood pressure control, while six (18.8%) perceived a reduced reliance on medication. Eight participants (25.0%) reported better overall well-being, including reduced fatigue and improved energy levels. Conversely, four (12.5%) reported no noticeable changes despite adhering to salt restriction. These outcomes are outlined in Table 5.

Overall, the findings highlight significant variability in awareness, lifestyle challenges, and adaptive strategies among patients. While most participants recognized some level of benefit from salt reduction, the degree of perceived impact was influenced by their awareness, social environment, and coping approaches.

Table 1: Demographic Characteristics of Participants

Variable	Value
Total Participants	32
Mean Age (years)	47.3
Age Range (years)	28–65
Male (%)	18 (56.3%)
Female (%)	14 (43.7%)
Mean duration of hypertension (years)	8.6
Urban Residence (%)	21 (65.6%)
Rural Residence (%)	11 (34.4%)

Table 2: Awareness Levels Regarding Salt Sensitivity

Awareness Level	Frequency (n)	Percentage (%)
High	10	31.3
Moderate	14	43.8
Low	8	25.0

Table 3: Reported Challenges in Dietary Modification

Challenge	Frequency (n)	Percentage (%)
Difficulty reducing taste	20	62.5
Family eating habits	15	46.9
Limited food choices	12	37.5
Social gatherings pressure	18	56.3
Lack of medical guidance	10	31.3

Table 4: Coping Strategies Reported by Participants

Strategy	Frequency (n)	Percentage (%)
Use of herbs/spices	16	50.0
Cooking separately	10	31.3
Gradual reduction	14	43.8
Support from family	12	37.5
Increased health awareness	9	28.1

Table 5: Self-Perceived Impact on Cardiovascular Health

Impact Category	Frequency (n)	Percentage (%)
Improved blood pressure control	14	43.8
Reduced medication need	6	18.8
Better overall well-being	8	25.0
No noticeable change	4	12.5

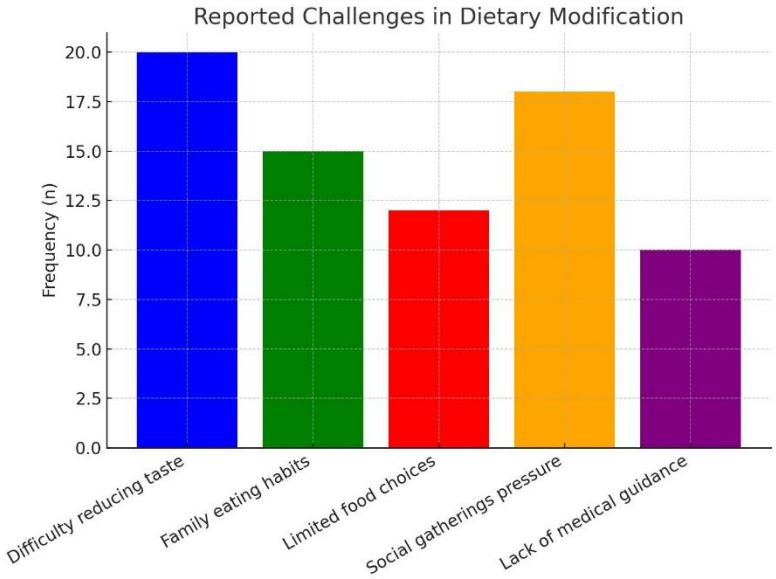

Figure 1 Reported Challenges in Dietary Modification

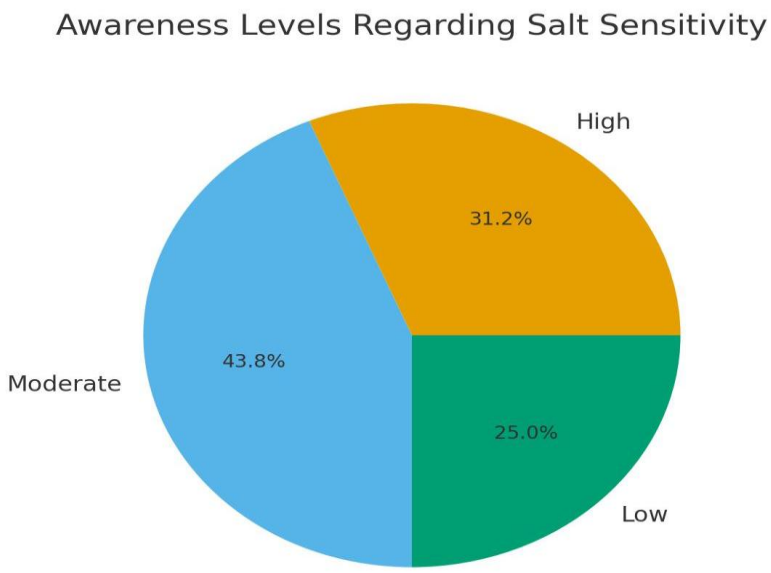

Figure 2 Awareness Level Regarding Salt Sensitivity

DISCUSSION

The findings of this study provided important insights into patient perceptions and lifestyle experiences related to salt sensitivity and its cardiovascular health implications (13). The results indicated that while awareness of salt sensitivity existed among a considerable proportion of participants, there remained substantial variability in understanding (14). Approximately one-third of individuals displayed high awareness, recognizing the role of salt in elevating blood pressure and cardiovascular risk, while others showed only partial or limited understanding. This distribution suggested that knowledge regarding salt sensitivity was not uniformly disseminated or comprehensively grasped by patients, reflecting a gap between medical advice and patient comprehension. The challenges described by participants highlighted the multifaceted barriers faced when attempting to adhere to salt-reduction strategies. The most common concern was the difficulty in maintaining taste satisfaction when reducing salt, a finding consistent with the well-established role of sodium in enhancing flavor (15). Social dynamics played an equally significant role, as family eating patterns and the pressure of communal meals often interfered with adherence to dietary advice. Social gatherings and cultural norms that prioritize shared meals rich in flavor reinforced these barriers. This underlined the fact that dietary changes are not only individual decisions but are embedded within broader cultural and familial contexts. Such findings emphasized that interventions need to be tailored not only to the individual but also to the surrounding social environment. Despite these challenges, participants identified several coping mechanisms that facilitated adaptation to salt restriction. The substitution of herbs and spices, gradual reduction in intake, and family support were among the most frequently cited strategies. These adaptive responses suggested that patients were capable of adopting creative and sustainable approaches when provided with sufficient knowledge and encouragement. The diversity of coping strategies revealed the potential for healthcare providers to promote practical alternatives that preserve flavor and social inclusivity while ensuring cardiovascular safety. The reported improvements in health outcomes, particularly better blood pressure control and enhanced well-being, reinforced the clinical relevance of these adaptive behaviors (16).

The implications of these findings extended to both clinical practice and public health. Clinicians could benefit from integrating discussions about salt sensitivity into patient counseling, using personalized communication that takes into account social, cultural, and familial barriers (17). Public health campaigns, while effective in promoting general awareness, may fail to address individual-level

challenges without incorporating patient narratives. The results indicated the necessity of a dual approach: broad educational initiatives to improve population-level knowledge and targeted interventions to support individuals navigating complex social environments (18). Strengths of the study included its qualitative design, which allowed for an in-depth exploration of patient experiences beyond quantitative measures (19). The use of thematic analysis provided a structured framework to identify key patterns while also preserving the uniqueness of individual narratives. The combination of descriptive statistics with qualitative themes strengthened the analysis by situating patient voices within a clear demographic context. The inclusion of participants from both urban and rural settings enriched the dataset, offering diverse perspectives that reflected variations in lifestyle and access to healthcare resources. However, certain limitations should be acknowledged. The study was restricted to a single region, which may limit the generalizability of the findings to other populations with different cultural or dietary practices. The relatively modest sample size, while adequate for qualitative thematic saturation, constrained the ability to capture broader variations across socio-demographic subgroups. Self-reported data also carried inherent limitations, as participants may have under- or over-estimated their adherence to salt reduction or the extent of perceived health benefits. Additionally, while thematic analysis provided a robust interpretive framework, some degree of subjectivity in coding and interpretation could not be entirely eliminated (20).

Future research could build on these findings by expanding the sample across multiple geographic regions to capture cultural differences in dietary practices and perceptions of salt sensitivity (21). Longitudinal studies would be valuable to assess how awareness, challenges, and coping strategies evolve over time, particularly in relation to long-term cardiovascular outcomes. Integrating biochemical assessments, such as urinary sodium excretion, alongside qualitative data could provide a more comprehensive understanding of both objective and perceived adherence (22). Furthermore, intervention studies testing the effectiveness of patient-centered strategies, such as flavor substitution programs or family-based counseling models, could help bridge the gap between awareness and sustained lifestyle change. In summary, the study highlighted that patient awareness of salt sensitivity and its cardiovascular implications was variable and often incomplete (23). The challenges of taste preference, social pressure, and family eating patterns emerged as significant barriers to dietary adherence, yet patients demonstrated resilience through the adoption of practical coping strategies. The perceived health improvements affirmed the relevance of salt restriction for cardiovascular protection, but the variability in experience underscored the need for more nuanced, socially sensitive, and personalized interventions. The study contributed to a growing recognition that patient voices are essential in shaping effective public health strategies, and it emphasized the importance of integrating medical guidance with the lived realities of individuals striving to manage their cardiovascular risk (24).

CONCLUSION

This study concluded that patient perceptions and lifestyle experiences surrounding salt sensitivity are shaped by varying levels of awareness, significant cultural and social barriers, and diverse coping strategies. While challenges such as taste adjustment and social influences hinder adherence, practical approaches like flavor substitution and family support facilitated positive change. The findings underscored the importance of patient-centered, culturally sensitive interventions to improve cardiovascular outcomes. By amplifying patient voices, this research contributed to bridging the gap between medical recommendations and real-world experiences, highlighting a pathway toward more effective and sustainable salt reduction strategies.

AUTHOR CONTRIBUTION

Author	Contribution
Mahak Ali*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Wafa Noreen	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Mahgul Omar	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Khadija Amjad	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Wajiha Zia	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Ayesha Suleman	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published
Aliya Sana	Contributed to study concept and Data collection Has given Final Approval of the version to be published

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