Knowledge, Perceptions and Practices of Salt Intake Among Hypertensive Patients Attending Out Patient Department in a Hospital in Pune

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KEYWORDS
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ABSTRACT

Introduction: Hypertension is a prevalent cardiovascular condition that can be significantly influenced by dietary habits, particularly sodium intake. However, adherence to recommended dietary guidelines, including salt limits, is often suboptimal at the population level. This lack of adherence may be attributed to limited awareness of dietary recommendations among hypertensive patients, emphasizing the need for improved education on nutritional guidelines. This study explores the levels of knowledge, awareness, and adherence to recommended salt intake practices among hypertensive patients attending outpatient departments (OPD). The objective is to assess existing gaps in understanding and implementing dietary guidelines among this patient population.

Methods: A cross-sectional study was conducted involving 500 hypertensive patients attending various OPDs. Data was collected using a structured questionnaire that gathered information on demographic characteristics, knowledge of the relationship between salt intake and hypertension, awareness of recommended daily salt limits, and self-reported salt consumption practices. Additionally, the study assessed participants' awareness of the potential health consequences associated with high salt intake.

Results: The study revealed significant variations in knowledge and adherence to dietary guidelines. 52.8 percent study participants had adequate knowledge regarding salt consumption. While 62% of participants demonstrated adequate awareness of the adverse effects of excessive salt intake, 38% remained misinformed or unsure. Knowledge of recommended salt intake was accurate among 54% of respondents, while 46% lacked correct information. Similarly, sodium intake recommendations were correctly identified by only 48%, with 52% unsure or incorrect. Despite 58% of participants recognizing the importance of salt reduction for blood pressure control, 42% perceived it as unimportant.

Regarding dietary practices, adherence to salt reduction strategies was low. Only 30% reported using spices instead of salt, cooking without added salt, avoiding salt at the table, and reading food labels. Additionally, 60% of participants continued consuming processed foods, highlighting a disconnect between awareness and practice. Gender differences were statistically significant in salt knowledge and consumption practices ($p=0.002$), emphasizing the need for gender-specific educational strategies.

Conclusion: These findings highlight the urgent need for targeted interventions to improve awareness and promote adherence to dietary recommendations among hypertensive individuals. Bridging the gap between knowledge and practice through tailored educational programs and behavioral support mechanisms may enhance

hypertension management and reduce associated health risks. Addressing these gaps with structured interventions could lead to better adherence to sodium guidelines and improved cardiovascular health outcomes.

Introduction

Hypertension is a significant risk factor for cardiovascular disease, with dietary sodium intake playing a crucial role in its prevention and management[1]. Excessive salt consumption is strongly associated with elevated blood pressure, yet global adherence to recommended sodium intake remains inadequate. While large-scale initiatives, such as food reformulation and public awareness campaigns, have been implemented to reduce sodium consumption, achieving sustained individual behavior change remains a challenge[2]. Evidence suggests that targeted behavioral interventions, including education and personalized dietary counseling, can significantly improve adherence to lower sodium intake[3, 4]. A critical aspect of managing hypertension lies in understanding the intricate relationship between dietary habits and blood pressure regulation[5]. Among dietary factors, salt intake emerges as a pivotal player, influencing blood pressure levels[6] and maybe exacerbating hypertension-related complications.

This research delves into the multifaceted realm of knowledge, awareness, and practice concerning salt intake among hypertensive individuals attending outpatient department (OPD). Despite the established link between excessive salt consumption and elevated blood pressure[5], the intricate dynamics of individual understanding, awareness, and practical implementation within the hypertensive population are not thoroughly explored. This study seeks to bridge this gap by scrutinizing the factors influencing the knowledge base, the extent of awareness, and the actual dietary practices related to salt intake among hypertensive patients in OPD settings.

By unraveling the nuances of salt-related behaviors within this demographic, our research aims to inform tailored interventions, shaping more effective patient education strategies, and ultimately contributing to improved hypertension management outcomes. As we embark on this exploration, we anticipate uncovering valuable insights that can reshape current healthcare practices and advance the global fight against hypertension.

Methodology

The cross sectional study was conducted in urban OPD randomly selected from three cardiac care private hospitals of Pune city. Informed consents of the patients and clinics was taken for conducting the study. IEC approval was taken from the hospital research committee. The knowledge, perception and practices were categorized as adequate and inadequate based on scoring done as per the recommendations of salt consumption practices.

Sample size

The study enrolled a representative convenient sample of 500 individuals from both sexes between the age group of 18-75 residing in Pune, India who had access to health care facility and who belonged to middle to high income group who were diagnosed as mild to moderate hypertensive as per the hypertension classification categories as per the International Society of Hypertension Global Hypertension Practice Guidelines[7] as elevated and Stage 1 Hypertension.

The study aimed to capture a diverse range of perspectives within this age group, ensuring a comprehensive understanding of salt-related behaviors among the target population. Participants were selected randomly from the pool of hypertensive patients attending OPD sessions, ensuring a diverse and unbiased representation of the target population. The study was conducted with the aim to investigate the knowledge, awareness, and practice of salt intake among hypertensive patients attending outpatient departments (OPD).

Data collection

A pre-tested and piloted structured questionnaire devised as a salt intake scale was employed as the primary data collection tool to assess various dimensions of salt intake such as individuals' knowledge, attitudes, and behaviors regarding their salt consumption, including awareness of health risks, consumption habits, and understanding of recommended intake levels, general awareness about the impact of salt on hypertension, knowledge of recommended daily salt intake, sources of salt in the diet, and individual practices concerning salt consumption and frequency of processed food consumption rich in sodium. A threshold of high salt intake as consumption aligning with WHO and general recommendations of above 5 grams per day was considered to assess the salt intake.

The questionnaire format utilized a Likert scale format[8], assigning scores to participant responses on a scale of 1 to 4, with a maximum possible score of 48 points for the 12 questions. The adequate or correct responses were scored the highest. The Likert scale provided a nuanced measurement, allowing participants to express their attitudes, knowledge levels, and practices regarding salt intake with a degree of granularity.

Statistical Analysis

The statistical analysis used frequencies and percentages and mean with standard deviation to summarize the basic features of the data. Chi-square test was used to assess the association between knowledge related with salt consumption domains and the actual practices associated with salt consumption and sociodemographic factors with knowledge, perceptions and practices.

Results

The study on salt intake sought to explore the dietary habits and perceptions of participants regarding sodium consumption. The findings shed light on prevalent patterns, attitudes, and potential areas for intervention to promote healthier dietary choices.

The table 1 presents demographic characteristics and health indicators of a sample population divided by gender. In total, there were 292 males (58.4%) and 208 females (41.6%). Regarding age distribution, the majority of participants were aged 50-60, with 76 males (34.2%) and 95 females (21.4%), while the least represented age group was 20-29, with only 15 males (4%) and 5 females (2.4%). In terms of BMI, the most prevalent category was 24.6-29.9 kg/m², with 139 males (55.2%) and 137 females (55.2%). Education-wise, a larger proportion of participants had education levels less than 12 years (60.4%) compared to those with more than 12 years of education (39.6%). Marital status indicated that 75% of males and 25% of females were married. Smoking habits showed that a significant portion of males (57.4%) were current smokers, while fewer females (9.2%) fell into this category. These results suggest notable gender disparities across various demographic and health-related factors within the studied population.

Table 1: Demographic and Anthropometric data of the participants

Characteristics		**Males (n= 292) (58.4%)**	**Females (n= 208) (41.6%)**	**Total n (%)**
Age range (years)	20-29	15	5	20 (4%)
	30-39	57	33	90(18%)
	40-49	61	51	112(22.4)
	50-60	76	95	171(34.2)
	>60	83	24	107(21.4)
	Mean & SD	58.4 ±11.8	41.6±10.6	50
BMI in kg/m2	<18.4	21	15	36(7.2)
	18.4- 24.5	110	26	136(27.2)
	24.6 – 29.9	139	137	276(55.2)
	>30	22	30	52(10.4)
Education years	> Graduate and above	147	51	198 (39.6)

	< Less than secondary schooling	145	157	302 (60.4)
Marital Status	Married	231	144	375 (75)
	Single/Divorced	61	64	125 (25)
Smoking	Current Smoker	236	51	287 (57.4)
	Previous Smoker	11	35	46 (9.2)
	Non-Smoker	45	122	167(33.4)

The study assessed participants' awareness, perceptions, and practices regarding salt intake and its health implications. Overall, 62% of respondents demonstrated adequate awareness by correctly identifying the adverse health effects of excessive salt intake, with similar proportions among males (61.6%) and females (62.5%). However, 38% of participants had inadequate awareness, highlighting a need for further education. Regarding knowledge of salt intake recommendations, 54% of participants correctly identified the recommended limits, while 46% remained uncertain or misinformed. Similarly, knowledge of sodium recommendations was inadequate in 52% of respondents, with only 48% accurately stating the guideline values.

Perception-wise, 42% of participants believed that reducing salt intake was not important, while 58% acknowledged its role in improving blood pressure control. Despite this awareness, the adoption of healthier dietary practices remained low. Only 30% of participants reported using spices instead of salt, cooking without added salt, avoiding salt at the table, and reading food labels. Furthermore, 60% of participants continued to consume processed foods, which are often high in sodium. These findings underscore a gap between awareness and actual dietary practices, emphasizing the need for targeted interventions to promote adherence to recommended salt intake guidelines and reduce hypertension risk.

Table no 2 Responses of Salt Intake scale on awareness, recommendations, perception and practices (n=500)

Category	**Male (n=292) n (%)**	**Female (n=208) n (%)**	**Total (N=500) n (%)**
Awareness Level			
Adequate (Correctly states salt raises BP and other adverse effects)	180 (61.6%)	130 (62.5%)	310 (62%)
Inadequate (Incorrect or unsure about salt's impact)	112 (38.4%)	78 (37.5%)	190 (38%)
Correct Salt Recommendation			
Adequate (Correctly stated as per guidelines)	160 (54.8%)	110 (52.9%)	270 (54%)
Inadequate (Incorrect or unsure about salt recommendations)	132 (45.2%)	98 (47.1%)	230 (46%)
Correct Sodium Recommendation			
Adequate (Correctly stated as per guidelines)	140 (47.9%)	100 (48.1%)	240 (48%)
Inadequate (Incorrect or unsure about sodium recommendations)	152 (52.1%)	108 (51.9%)	260 (52%)
Perception Level			
Belief that salt reduction is important for health	120 (41.1%)	90 (43.3%)	210 (42%)
Belief that salt reduction improves BP control	172 (58.9%)	118 (56.7%)	290 (58%)

Practice Level			
Uses spices instead of salt	85 (29.1%)	65 (31.3%)	150 (30%)
Cooks without adding salt	90 (30.8%)	60 (28.8%)	150 (30%)
Avoids adding salt at the table	87 (29.8%)	63 (30.3%)	150 (30%)
Reads food labels	87 (29.8%)	63 (30.3%)	150 (30%)
Avoids processed foods	117 (40.1%)	83 (39.9%)	200 (40%)

Table no 3 Association between knowledge and salt consumption practices across the genders (n=500)

Gender	Adequate Knowledge & Good Practice	Adequate Knowledge & Poor Practice	Inadequate Knowledge & Good Practice	Inadequate Knowledge & Poor Practice	Total	P value
Male	33	120	59	80	292	0.002
Female	90	20	20	78	208	
Total	123	140	79	158	500	

The table 3 suggested that 52.8% of the study population i.e. 264 study participants comprising of 154 males and 110 females showed adequate knowledge related with salt consumption. A statistically significant association between gender, salt consumption knowledge (adequate/inadequate), and salt consumption practice (good/poor) (<0.005) highlighting the distribution of knowledge and practice is not independent of gender in the present study (Table 3). No statistical significance with other demographic details found except the gender.

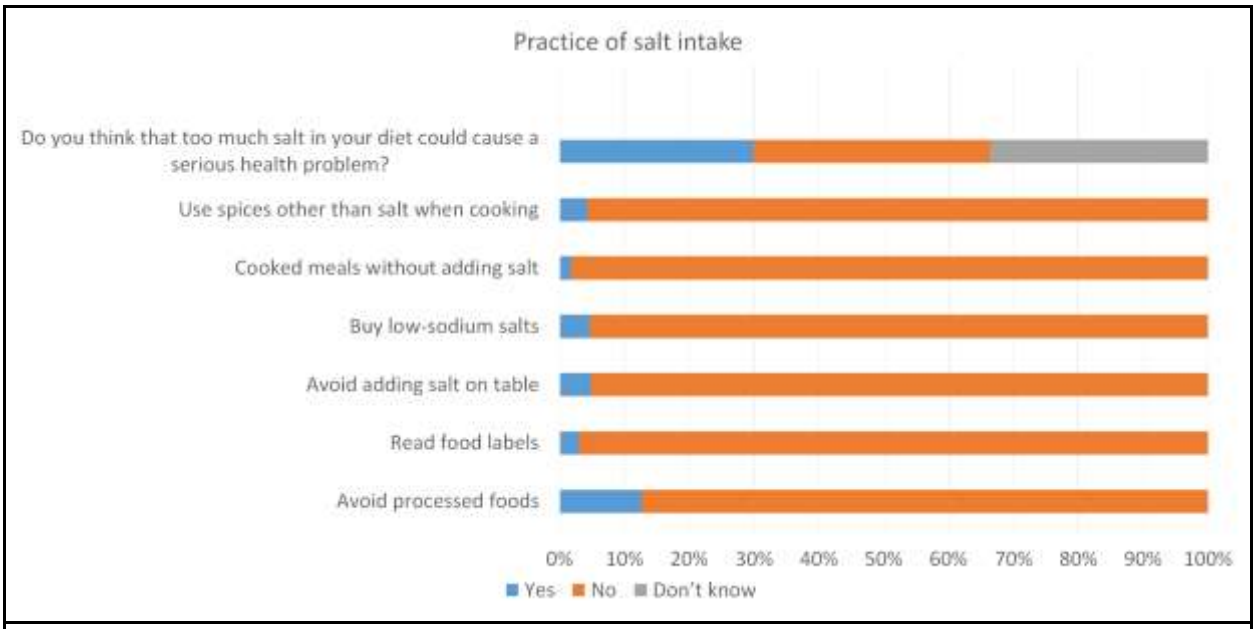

Figure 1: Percentage of participants involved in the above mentioned activities concerning salt intake

The bar graph titled "Practice of salt intake" illustrates the dietary habits related to salt consumption among hypertensive patients. The findings indicate that approximately 50% of respondents acknowledge the potential health risks associated with excessive salt intake, while 40% do not perceive it as a serious issue, and 10% remain uncertain. However, despite this awareness, a substantial proportion of participants do not adhere to recommended salt reduction practices.

Specifically, around 70% of respondents do not use spices as an alternative to salt when cooking, do not cook meals without adding salt, do not purchase low-sodium salts, do not avoid adding salt at the table, and do not read food labels. Furthermore, approximately 60% continue to consume processed foods, which are often high in sodium. These findings underscore a significant gap between knowledge and practice, highlighting the need for targeted educational interventions to improve adherence to dietary guidelines and promote healthier dietary behaviors among hypertensive individuals.

A significant 87% of participants reported consuming processed foods, yet only 3% read food labels before purchasing, indicating limited awareness of nutritional content. Despite this, 64% believed their salt intake was appropriate, highlighting a gap in understanding sodium content and its health effects. Furthermore, only 26% recognized the adverse health impacts of excessive salt consumption, underscoring the need for improved education.

Additionally, 60% of participants viewed salt reduction as unimportant, posing challenges for effective public health interventions. Nearly all participants (98.8%) reported adding salt during meal preparation rather than at the end, reflecting a common cultural practice that may contribute to excessive intake. Alarmingly, 76% exceeded the recommended daily limit of <5 grams of salt, with a majority ranking poorly on the salt intake scale. Only 13% adhered to dietary guidelines by limiting processed food consumption. These findings highlight the urgent need for targeted interventions to enhance awareness and encourage healthier dietary behaviours.

Discussion

The study's findings provide valuable insights into the patterns and perceptions surrounding salt consumption. Addressing these aspects through targeted education and awareness campaigns could contribute to promoting healthier dietary habits and reducing potential health risks associated with excessive salt intake[9]. Public health structured interventions should be designed to target specific areas identified in the study, fostering informed choices and healthier practices among the participants[10].

Our study on the Knowledge, Perceptions, and Practices (KAP) of salt intake among hypertensive patients aligns with global trends observed in various research studies. The significant prevalence (87%) of processed food consumption and low rates (3%) of reading food labels before grocery purchases resonate with broader observations in the literature, indicating shared dietary patterns and a common challenge in promoting nutritional awareness. While these consistencies underline the need for targeted interventions addressing processed food consumption and label reading among hypertensive individuals, it is crucial to acknowledge potential variations in regional, cultural, and socio-economic contexts that may influence these behaviors differently. Cross-cultural studies and longitudinal assessments would provide more nuanced insights, enhancing our understanding and guiding the development of context-specific interventions for improving salt-related KAP in hypertensive populations.

A notable disparity emerged, as 64% of participants believed they were consuming an appropriate amount of salt despite the processed food intake. This echoes a similar discordance identified in a study by Hooper et al.[11], where participants underestimated their salt intake, highlighting potential misconceptions about dietary habits. Furthermore, our study indicates that only 26% of participants were aware of adverse health effects associated with excess salt intake. This mirrors the low awareness rates reported in the literature, as seen in the work of Deborah Gold, MacClung B 2006, emphasizing the persistent need for enhanced patient education[12] on the health implications of high salt consumption. These consistent trends underscore the imperative for targeted interventions to address misconceptions and bolster awareness among hypertensive individuals.

The observation that 60% of participants perceived the reduction of salt in their diet as unimportant is a significant finding that aligns with challenges identified in various other studies. This dismissive attitude towards salt reduction echoes similar sentiments reported by Khalesi et al. 2022[13], where a substantial portion of the population downplayed the importance of reducing salt intake, hindering

efforts towards behavior change. This shared trend emphasizes a persistent gap in understanding and highlights the need for tailored educational campaigns. Our study adds to the growing body of evidence indicating that a substantial proportion of hypertensive individuals may not fully grasp the significance of salt reduction in managing their condition. The implication is that interventions must not only focus on disseminating information but also address the underlying perceptions and attitudes that influence individuals' dietary choices[14]. By comparing our findings with those of other studies, we reinforce the imperative for nuanced, targeted educational strategies to effectively communicate the health risks associated with elevated salt consumption and promote meaningful behavioral change among hypertensive populations.

Our study found that 98.8% of participants reported adding salt while preparing meals rather than adding the salt after the food have been cooked, a practice observed that aligns with cultural norms observed in multiple studies. This widespread habit reflects global dietary behaviors, as noted by Smith et al. (2006), who highlighted a strong cultural preference for using salt as a seasoning agent across various cuisines.[15]. This shared trend underscores the deeply ingrained nature of this dietary habit, posing a significant challenge for public health initiatives aiming to reduce salt intake. While the idea that adding salt at the end can reduce salt use has some logical basis and some support from studies on saltiness perception, the evidence that it consistently reduces the total amount of salt used in cooking is not strong. Adding salt at the end might be a helpful strategy for some individuals, but it's not a guaranteed solution and shouldn't be relied upon as the sole method for reducing salt intake. Interventions targeting cooking practices, as suggested by Farmer N et al, 2018[16] in their work on cultural influences on dietary habits, become crucial in addressing this normative behavior and promoting healthier choices. Our study contributes to this understanding by highlighting the near-universal prevalence of salt addition during meal preparation among hypertensive individuals. These findings collectively emphasize the importance of culturally sensitive interventions to effectively shift these ingrained practices and promote a reduction in salt consumption within hypertensive populations.

Our study's revelation that a substantial majority of participants (76%) ranked poorly on the salt intake scale resonates with findings in other studies, indicating a pervasive lack of awareness or concern regarding sodium consumption. Similar results were reported by Kwong ELG et al 2022[17], who conducted a population-based survey highlighting that a significant proportion of individuals exhibited low awareness levels regarding the recommended limits for salt intake. This shared trend underscores a concerning gap in knowledge and attitudes towards salt consumption, reinforcing the need for targeted interventions to enhance awareness and promote healthier attitudes. Additionally, our study's identification of only 13% ranking well on the salt intake scale aligns with the challenges identified by Almas A et al 2012. In their investigation of hypertensive patients, emphasizing the persistent difficulty in fostering positive attitudes towards salt reduction within this demographic[18]. These findings collectively underscore the imperative for tailored interventions to bridge the awareness gap and cultivate healthier attitudes toward salt intake among hypertensive individuals.

The insights gleaned from our study into patterns and perceptions surrounding salt consumption align with the recommendations drawn from various other research endeavors. Similar sentiments were echoed by Silvia Santos et al. 2021, who emphasized the importance of addressing perceptions and habits through targeted education to curb excessive salt intake[19]. Additionally, the call for tailored public health interventions aligns with the conclusions drawn by Smith and colleagues, who stressed the need for nuanced strategies to promote informed choices and healthier practices among specific populations[20].
Comparisons with other studies highlight the global nature of these challenges, emphasizing the importance of culturally sensitive strategies in promoting healthier dietary habits among hypertensive individuals[21].

By drawing parallels with these studies, our findings underscore the significance of developing comprehensive, participant-focused campaigns that target the identified areas of concern. This approach ensures that interventions are not only informed by current research but are also designed to effectively address the specific challenges associated with salt consumption patterns[22] and perceptions among the population under study.

Conclusion

In conclusion, our study on the Knowledge, Perception, and Practice (KAP) of salt intake among hypertensive patients provides a comprehensive insight into the intricate dynamics surrounding dietary behaviors in this population[23]. The findings reveal a lack of adequate knowledge and practices among hypertensive individuals along with a prevalent consumption of processed foods, highlighting a concerning gap in knowledge and attitudes toward salt intake. Also, the observed discrepancies between reported salt consumption and perceived appropriateness, coupled with limited awareness of health risks associated with excess salt intake, underscore the need for targeted educational interventions. The identified patterns call for multifaceted public health campaigns addressing specific areas such as cooking practices, label reading habits, and perceptions of salt reduction. By integrating these insights into intervention strategies, healthcare professionals and policymakers can strive to bridge the awareness gap, foster positive attitudes, and ultimately contribute to reducing the health risks associated with excessive salt intake in hypertensive populations.

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