

Knowledge attitude, and practice regarding dietary salt intake among urban slum population of North India

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ABSTRACT

Introduction: Hypertension is an important modifiable risk factor for cardiovascular disease. High salt intake is an etiological factor for hypertension. Any effective salt reduction strategy will be based on people's mind-set about salt use. Our objective for this study was to assess the knowledge, attitude, and practice for dietary salt intake by urban slum populations in Indira Colony, Chandigarh. **Methodology:** In 2015, we conducted a cross-sectional survey among a representative sample of 300 adults aged 18–69 years using a standardized questionnaire. Variations in the knowledge attitude and practice by gender and residence location were compared using the Chi-square tests. **Results:** Most of them (96%) took processed foods and 99% did not bother about the salt levels in the food. They also added salt on table. They did not buy low-sodium salts. Majority of them (75%) perceived that they are taking right amount of salt. They were clueless about the daily recommended allowance. Many participants (43%) did not know about the harmful effects of dietary salt. One-fifth (18%) of them had wrong information about dietary salt. Majority of the participants (64%) considered that lowering salt in diet is not important. **Conclusion:** Overall awareness level about optimal salt intake in diet was very poor among the slum residents. **Recommendation:** Development of effective public education initiative is the need of the hour for combatting hypertension.

Keywords: Hypertension, Salt intake, Slum populations, Taste modification

Introduction

Hypertension is an important modifiable risk factor for cardiovascular diseases (CVDs). It currently accounts for about 7.6 million (13.5%) of annual global deaths.^[1] Hypertension is directly responsible for 54% of all strokes and 47% of all coronary heart diseases worldwide. Low- and middle-income countries bear a disproportionate burden of hypertension-related risk of death, which is double that of high-income countries.^[2]

Excess dietary salt intake is responsible for 17%–30% of hypertension and related cardiovascular events.^[1] However, such evidence has not been converted to an effective program to convince people to reduce their salt intake. Average per capita

salt consumption 13.8 g/day (range 7–26 g/day) in India.^[3] It is reported to be higher in urban settings compared to rural settings.^[4]

Any strategy to reduce the dietary salt is related to change in our food behavior. This is not an easy task. We need to provide health education (in community or in clinics with the help of dedicated counselors) along with creation of an enabling environment for people to adopt this food behavior change, that is, low-salt diet intake. So far, only medical, that is, “microlevel” approach has been tried for this purpose. This focuses on “sodium” and “medicines” only. We forget to address the “macrolevel factors” such as, education level of food handlers, kitchen practices and family dynamics, their cultural diversity, and their conditioning to a particular desired level of salt in food to make it tasty. We also need to factor in people's knowledge, attitude, and practices about salty diet in any strategy planned to reduce salt intake.^[5]

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As clinicians, we have always tried to use a paternalistic (parent–child) approach to counsel the patients to reduce dietary salt intake. It is usually done in a clinic setting. Community or family level contact between doctor and patient is completely missing. The approach has always been to create a fear among the public regarding various risk factors, for example, salt intake.

In other words, we are trying to impose a behavior change on the people. Actually, we have failed to effectively design and implement awareness program for dietary salt reduction through active involvement of patients or their families. For this reason, the response has not been up to the desired extent. It requires much more than an outpatient department-based doctor–patient interaction. We need to address the “macrolevel factors” such as health education of family members. Our approach should be holistic. For example, our behavior is influenced by “significant other.” However, this is not “factored in” while planning an educational campaign.^[5]

Mode of salt intake also (adding before, after cooking, type of salt, etc.) differs as per the cooking habits of individual. In India, home cooking is widely prevalent. Available information from the National Institute of Nutrition, Hyderabad, India, indicates that most salt is added during cooking and/or at the table. This is in contrast to the developed world where processed foods contribute most substantially to overall salt intake.^[6]

Slum population lives much closer to poverty line. They will face much higher risk of falling into poverty trap if CVD-related treatment is sought and expenditure is incurred. Simple behavior change, that is, salt reduction in diet through health education might be the most cost-effective measure for them to prevent hypertension.^[7]

No such study has been conducted till date among urban slum population about their knowledge attitude and practices on salt consumption.

Our objective was to the knowledge, attitude, and practice for dietary salt intake by urban slum populations in Indira Colony, Chandigarh.

Methodology

Study setting

School of Public Health, Post Graduate Institute of Medical Research (PGIMER), Chandigarh, offers many courses; MD Community Medicine (3 years) is one among them. During these 3 years, the school prepares the resident as a Public Health Expert. During the training period, the residents are posted in rural and urban health posts of School of Public Health, PGIMER. These are located in different places of Chandigarh, Punjab, and Haryana. In Chandigarh, a team (comprising faculty, senior, and junior residents along with nurse and multipurpose health worker) from the Community Medicine department is also posted in Urban Health Training Centre (UHTC), Indira Colony (the urban slum). The team provides preventive,

promotive, and curative services free of cost through home visits and outpatient services in this slum (field practice area of Community Medicine Department, School of Public Health). However, most of them seek treatment from private local doctors (unqualified/quacks) who are all time available for them, and it is chargeable (out of pocket). Health insurance coverage among these migratory population is patchy (<5%).

Most of them have migrated from the state of Uttar Pradesh, India. Most of the male members are laborer by profession. They are busy all the day.

Intake of fruits or vegetables is low in their population as these are costly. Most of them are used to take fast foods (samosa-snacks/burger/hot dogs with chutney) from local vendors. Rapid proliferation of fast food corners in this colony has been observed recently. Routine morbidity report revealed that non-communicable diseases (NCDs) (mainly hypertension, chronic pulmonary disease, and diabetes) have outnumbered communicable diseases such as tuberculosis and pneumonia in this colony. Major causes of death in this colony are cardiovascular death (among hypertensive patients) followed by aging and chronic lung diseases (morbidity and mortality register of U. H. T. C.).

This cross-sectional study was conducted from November 1, 2013 to June 30, 2014. The WHO step-wise approach to NCD risk factor surveillance (STEPS) Instrument version 3.1 module for salt estimation was used for salt intake estimation by the health workers.^[8]

It has been reported that 30% of population took high salt as per the Chandigarh Healthy Action Project 2005 study.^[9] Population of Indira Colony (slum) was 26,000; considering prevalence of 30%, 80% power of study, 90% confidence level, design effect equals to 1, with 5% precision (absolute), our sample size came around 225, by Epi-Info software version 6 CDC Atlanta. Hypertension was prevalent in this population(34%). However, we took 300 participants to accommodate dropouts. The questionnaire was translated in local language and internal consistency was measured during pilot testing. We did a systemic random sampling. We included the residents who were adults (>18 years), residing here for >5 years. The eldest person present in the house at the time of survey was main respondent.

We contacted them house to house with the help of health workers. Response rate was 100%. A face-to-face, close-ended questionnaire was administered by health workers. They had previous experience in conducting health surveys. Questions collected information on demographics (gender, age, education, and profession), health status (hypertension, diabetes, chronic obstructive pulmonary disease, and cancer), and knowledge, attitudes, and practices related to dietary salt (relationship between salt and hypertension, consequences of hypertension, perception of salt consumption, self-reported consumption, and practices toward reducing salt consumption).

Approval from Ethics Committee of the PGIMER, Chandigarh, was taken. Written informed consent was taken from the respondent.

Educational level and annual household income were used as indicators for socioeconomic status. We divided participants into five groups by education level: Illiterate, primary school (7th), junior high school, (8–11th), senior high school (12th), or any college (graduate) and above. Annual household income level was classified in very high (>Rs 20,000), high (Rs 16,000–20,000), upper middle (Rs 11,000–15,000), middle (Rs 6000–15,000), and low (<Rs 5000). Participants were designated as hypertensive if their systolic BP was >140 mmHg and/or diastolic BP >90 mmHg and/or if they were currently taking antihypertensive medication. It was verified by checking antihypertensive pills and medical prescriptions during the survey by health workers and investigators.

Statistical analysis

Statistical analyses were performed with SPSS 17.0 for Windows (Chicago, IL, USA). The difference in proportions of Knowledge Attitude and Practice (KAP) rates was compared using the Chi-square test. The significance level was set at $P < 0.05$.

Results

Demographic details are described in Table 1.

Knowledge, attitude, and practice about salt intake

Table 2 shows the salt intake-related information of the study populations. Most of them (96%) used to take processed foods and 99% did not bother about the salt levels on the food. More than 95% population used to take added salt on table. Most of population (98%) did not buy low-sodium salts. Majority of the participants (75%) perceived that they are taking right amount of salt. Further probing revealed that they were clueless about the daily recommended allowance and it was not surprising to us. Nearly, half of them (43%) did not know about the harmful effects of dietary salt and one-fifth (18%) of them having wrong information about dietary salt. Majority of the participants (64%) considered that lowering salt in diet is not important at all. No association was found between high salt intake with respect to education, occupation and income among the residents.

Discussion

Excess dietary salt is a major contributor to hypertension, a critical public health issue in India. It is a well-known fact, but the question of how to address this problem still remains unanswered. This is because of our microlevel approach. We are always discussing antihypertensive medications, arterial stiffening by calcification, decrease salt intake by <5 g/day, etc.^[9-13] We have never considered the macrolevel factors such as environment of kitchen, how a food handler will measure the salt level during

Table 1: Demographic details of the respondents

	n (%)
Sex	
Male	61 (20.4)
Female	239 (79.6)
Education	
Illiterate	146 (48.8)
Primary + middle school	122 (40.7)
High school + graduate	32 (10.6)
Occupation	
Homemaker	210 (69.8)
Job + self-employed	86 (28.4)
Retired	4 (1.8)
Total family income	
Low + poor	240 (80)
Middle + upper middle	49 (16.1)
Upper	11 (3.9)
Chronic diseases	
Hypertension	20 (6.67)
Hypertension + chronic pulmonary disease	14 (4.56)
Hypertension + diabetes	4 (1.05)

cooking, food handlers own food habit, what are the cultural practices, their compulsion, and their education level.

Clinicians are not excluded from macrolevel factors. Merely writing a single line prescription “decrease salt in diet” will not change the food behavior of the patients, overnight. Changing food behavior is not an easy task. It takes time and sustained effort. Another fact is that hypertensive patients may not have control over food preparation. We have never bothered about the kitchen dynamics, role of family members. Educating the family members regarding harmful effects of dietary salt intake along with hypertensive patients can ensure good results. For this reason, our microlevel approach has failed.

The present study suggests that most of our respondents did not know the daily recommended level for salt intake. Still majority of them perceived themselves as consuming right amounts of salt. It was not surprising that salt reduction in the diet was practiced by <5% of the population in the urban slum.

Many participants (43%) did not know the harmful effects of taking excess salt in diet. Three-fourth of the population did not think that lowering salt intake in diet is important at all. This also indicates wrong perception. Hence, we need to rectify this.

Our findings also suggest that most (>95%) of the slum population took processed foods. They did not buy low-sodium salts. Most of them had not heard the term “low-sodium salts.” They did not use any salt alternatives.

We found poor levels of knowledge which may lead to unfavorable attitudes toward salt reduction. Our findings provided evidence that in a low socioeconomic setting, more effort is needed to educate the slum population about the ill effects of excess salt intake.

Table 2: Response to standard questionnaire for salt intake

Question	Response	Score	n (%)	
1. How often do you add salt to your food before you eat it or as you are eating it?	Always	1	96 (31.9)	
	Often	2	19 (6.3)	
	Sometimes	3	113 (37.9)	
	Rarely	4	15 (5)	
	Never	5	57 (18.9)	
	Don't know	6	0	
2. How often is salt added in cooking or preparing foods in your household?	Always	1	256 (85.4)	
	Often	2	1 (0.3)	
	Sometimes	3	34 (11.3)	
	Rarely	4	2 (0.7)	
	Never	5	7 (2.3)	
	Don't know	6	0	
3. How you often do you eat processed food that is high in salt such as pickles, chutneys?	Always	1	31 (10.3)	
	Often	2	24 (8)	
	Sometimes	3	164 (54.8)	
	Rarely	4	38 (12.6)	
	Never	5	43 (14.3)	
	Don't know	6	0	
4. How much salt do you think you think you consume?	Far too much	1	11 (3.7)	
	Too much	2	23 (7.6)	
	Right amount	3	226 (75.4)	
	Too little	4	33 (11)	
	Far too little	5	6 (2)	
	Don't know	6	1 (0.3)	
5. Do you think that too much salt in your diet could cause a serious health problem?	Yes	1	119 (39.5)	
	No	2	53 (17.6)	
	Don't know	3	128 (42.9)	
6. How important to you is lowering the salt in your diet?	Very important	1	65 (21.6)	
	Somewhat	2	16 (5.3)	
	Important	3	20 (6.6)	
	Not at all	4	191 (63.5)	
	Don't know	5	9 (3)	
7. Do you do anything of the following on a regular basis to control your salt intake?	Avoid consumption of processed foods	Yes	1	13 (4.2)
		No	2	287 (95.8)
	Look at the salt levels on the food	Yes	1	2 (0.7)
		No	2	298 (99.3)
	Eat meals without added salt on table	Yes	1	14 (4.6)
		No	2	286 (95.4)
	Buy low-sodium salts	Yes	1	6 (2.1)
		No	2	294 (97.9)
	Cooked meals without adding salt	Yes	1	2 (0.7)
		No	2	298 (99.3)
	Use spices other than salt when cooking	Yes	1	17 (5.6)
		No	2	283 (94.4)
	Avoid eating out	Yes	1	159 (53)
		No	2	141 (47)
	Others			

Our study highlights that 47% of slum residents regularly ate meals (local fast foods) outside their home (local fast food outlets). Most of the male workers spent their time outside

home while working. Homemakers preferred cooking dinner only when their husband came back home from workplace at night. As dining after the husband is a subjective norm for them. Cooking for themselves only in the daytime is not usual for them. Besides subjective norms, cost-cutting was also a major reason. Cooking meal is costlier than buying a burger INR 10 per piece from street vendor.

Overall slum residents had a poor knowledge about the links between salt and hypertension. As a result, they were less likely to take action toward salt reduction. As usual, they also lacked specific knowledge recommendations on the maximum intake of salt at 6 g/day.^[9-13] This may partly explain why many residents did not consider their salt intake as a problem. Another important issue was that as people with hypertension are largely asymptomatic. They may fail to perceive a benefit from a diet that they consider too restrictive.

In fact, salt reduction is beneficial in both normotensive and hypertensive people. A review of randomized controlled trials found that reduction of salt 1 g for at least 6 months' period cause a reduction in systolic and diastolic pressure by 1 mmHg in normotensives and by an average of 2–4 mmHg in hypertensive patients.^[9-13]

Knowledge, attitude, and practices of urban slum residents regarding optimal salt intake were generally very poor. Women, in the household, are an important group to target because food salt is controlled by them. They should be educated along with the members in the family. In the UK, in 2003, successful public awareness campaign was arranged targeting adult females, by the Food Standards Agency.^[14]

Effective public education should emphasize the benefits of salt reduction. The awareness program should target all slum women/food maker (as conducted in the U.K.), as they can play an important role for the prevention of hypertension by decreasing salt in diet. Health education can rescue the slum population from the trap of vicious cycle of poverty and ill health, followed by impoverishment.^[15]

Generally speaking, whenever we plan for educating people to decrease salt intake we need to focus more on macrolevel factors, such as good practices in kitchen, increase in awareness of food handlers, and homemakers or the person who is responsible for cooking.

Going by their responses, it seems that the study population is conditioned to consume a high salt level diet. Using a "Taste Modification" approach to bring about desirable change in their salt consumption pattern can yield good dividends.^[5] Hallmark of this strategy is a focus on nonmedicinal health-promoting intervention.

Development of effective public education initiative is the need of the hour for combatting NCDs such as hypertension. Such

initiatives may aim to educate the public on the relationship between excess salt and health. There is a need to increase the public's demand for lower salt diets, and to promote individual dietary behavior change. Health education program (focused on the importance of dietary salt reduction for prevention of hypertension) can prevent hypertension followed by cardiovascular death among slum residents as majority of them were suffering from hypertension (census).

Conclusion

Overall awareness level was very poor among the slum residents. They are taking high salt diet. They are also copying "bad" modernization-related dietary habits due to cost cutting.

Recommendation

Development of effective public education initiative is the need of the hour for combating hypertension due to high salt intake.

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Conflicts of interest

There are no conflicts of interest.

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