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Dietary salt intake infield practice area under community medicine department with a view of life style diseases in city Ahmedabad (Gujarat)

[*1] Dr. Yamini J Gurjar, [2] Dr. MK Lala, [3] Dr. Hardik Yagnik, [4] Dr. Navin Rajashekhar, [5] Dr. Arpit Dhudhwala
[1, 3, 4, 5] Post graduate student, Department of Community Medicine, BJ Medical College, Ahmadabad, Gujarat, India
[2] Associate Professor, Department of Community Medicine B.J. Medical College, Ahmadabad, Gujarat, India

Abstract
Introduction: Excess salt consumption is a leading cause of high blood pressure and has been reported as the leading cause of mortality worldwide.
Aims & Objectives: To assess dietary salt intake and its awareness in community. To correlate this with various life style disorders.
Methodology: This cross-sectional survey was conducted in B. J. M.C. field practice area under Community Medicine department. A total number of family surveyed were 233. The data was collected by a semi-structured questionnaire. Analysis was done by Microsoft offices excel with use of chi-square test.
Results: In this study, the mean dietary salt intake was 12.40 g/day/per consumption unit. Proportion of hypertension in the families' studied was 24.9%. Relationship between awareness level and practices of taking salt intake in diet was found significant ($p=0.0028$ at $p<0.05$).
Conclusion: People are still not aware of harm of taking excess salt in diet which was evident in present study as a sizeable percent of population are suffering from hypertension.

Keywords: awareness, salt intake, SES, hypertension, family

1. Introduction
NCDs are the leading causes of mortality and morbidity worldwide. It is increasing globally due to industrialization, socio-economic development, rapid urbanization, demographic and lifestyle changes [1]. The main preventable risk factors for NCDs are tobacco consumption, harmful use of alcohol, the unhealthy diet including high salt intake and physical inactivity [1].
There is significant evidence for a relationship between salt intake and various lifestyle diseases such as renal stones, CA stomach, osteoporosis and most importantly systemic hypertension which is a major risk factor for cardiovascular disease and stroke [2]. It is estimated that globally 62% of cerebrovascular disease and 49% of ischemic heart disease were attributable to elevated blood pressure [3]. Hypertension is directly responsible for 57% of all stroke deaths and 24% of CVD deaths in India [4]. Salt restriction has been shown to lower systolic and diastolic blood pressure, particularly in patients with hypertension and lowering blood pressure is associated with better cardiovascular outcomes [5, 6]. So salt reduction is a simple strategy to lower blood pressure to the lower limits of the normal range. reduction in dietary salt from the current intake of 9-12 g/day to the recommended level of less than 5-6 g/day will have major beneficial effects on cardiovascular health along with major healthcare cost savings around the world [3]. RDA of salt intake according to WHO is 5gms/day/person [7].

2. Aims and objectives
- To assess dietary salt intake and its awareness in the community.
- To correlate this with various lifestyle disorders.

3. Materials and methods
3.1 Study design
This was a cross-sectional study done in B. J. Medical College field practice area under Community Medicine department in Ahmedabad city from August 2016 to November 2016.

3.2 Study population
3.2.1 Sampling procedure and sample size
The sample size was calculated using the formula $4Pq/L^2$. Proportion taken was 30% with 20% allowable error on the base of hypertensive prevalence (around 29.8% =30%) [4] at 95% confidence interval with sample size calculated was 233 families.

3.2.2 Data collection
A total number of family surveyed were 233.Data collection was done using simple random sampling technique for selection of houses on the basis of line listing done by MSW and a first house was selected randomly while the subsequent houses were selected in the chronological order. Information had been gathered using a semi-structured questionnaire Performa and data were collected from the family member

who cooked at home for the family. Questions were asked regarding salt purchasing, consumption habits and awareness regarding the risk of high salt intake.

3.3 Data analysis
Data analysis was done by Microsoft offices excel, Epi-info and statistical test used was chi-square.

4. Results
In our study, the mean dietary salt intake was 12.40 gms/day/per consumption unit. Consumption of dietary salt was found to be significantly high (p=0.000002) in 109(46.78%) nuclear families in comparison to 65(27.89%) joint families. (Table 1)

Dietary salt intake was higher (>6gm/d) in all studied families. The proportion of families belonging to SEC-lll 56(24%), SEC-ll (21.88%), SEC-lV 50(21.46%) were consuming more salt as compared to SEC-l 25(10.72%), SEC-V 5(2.14%). The proportion of hypertension in the families' studied was correlating with a proportion of families consuming more salt. Though it was found to be insignificant p>0.05. The proportion of hypertension in the families' studied was 24.9% it was more in Socio-Economic Class 3(7.7%) and Socio-Economic Class 4(7.1%) & Socio-Economic Class 2(5.1%) in comparison to Socio-Economic Class 1(3%) Socio-Economic Class 5(1.7%). (Table 2) More than half (75.9%) of the family were unaware of the benefits of iodine.

Some questions assessed knowledge related to salt intake. The majority of families (58.79%) didn't know that eating too much salt could damage their health. In spite of knowing or not knowing about, 60(25.75%) families were practicing low salt intake in their diet. Most (33.90%) of families were aware of the relationship between high salt intake and high blood pressure. Approximately some family (2%) knew of the relationship between salt intake and stomach cancer and kidney diseases, however far fewer were aware of links with osteoporosis. A relationship between awareness level and practices of taking salt intake in the diet was found significant (p=0.0028 at p<0.05). (Table 3)

In this study, there was the proportion of families who reported using salt at the table and during cooking. The reported use of cooking salt was higher than table salt with about majority (98.29%) of families always add salt during cooking, while only (17.59%) always add salt to the table. (48.50%) of families often ate pickles/ papad/ lemon water, whereas about (51.50%) reported that they never eat them. 40.34% of families were taking salt because of taste, 22.31% were doing it because of unawareness.(Table 4)

5. Discussion
In our study, the mean dietary intake of sodium (12.40 gms/day/per consumption units) which was higher than the WHO recommendation (salt intake 5 gm/day/person) [7]. Another study was done in India (Delhi, Andhra Pradesh) showed that salt consumption was high [8]. The study was done in south Indian population where the mean dietary intake of sodium was significantly more in men (4.1 ± 2.3 g/day) than women (3.2 ± 1.7 g/day) and mean intake is less than our study [9]. The difference may be due to different dietary practices in Sothern India. one study done in Beijing, a mean dietary salt intake was 13.3 ± 5.9 g/person/day [10]. Consumption of dietary salt was found to be more in 109(46.78%) nuclear families in comparison to 65(27.89%) joint families which was found highly significant (p=0.000 at p<0.05).

In the present study, 75.9% families were unaware of the benefits of iodine. Study done in Uttar Pradesh by Rupali Roy *et al*. revealed that 53.8% households were unaware of the benefit of iodine [11].

In the present study, dietary salt intake was high among SES-III, SES-II, SES-IV, and proportions of hypertension in the families were also high. In J-HOPE study, there was a negative association between SES and blood pressure or prevalence of hypertension [12]. But our study showed that very high & very low socioeconomic class families I & V had salt intake and occurrence of hypertension was less. It may be due to the fact that the salt is universally used by all the socioeconomic groups.

In the present study, 58.79% family didn't know that eating too much salt could damage their health. 33.90% of families were aware of the relationship between high salt intake and high blood pressure. 2% family knew of the relationship between salt intake and stomach cancer and kidney diseases, few were aware of links with osteoporosis. The relationship between awareness level and practices of taking salt intake in the diet was found significant (p=0.0028 at p<0.05). In the study done in Australia, 83% participants knew that eating too much salt could damage their health and 83% were aware of the relationship between high salt intake and high blood pressure and 77% were heart disease/heart attack [13].

In our study, 98.29 % of families had reported that they always add salt during cooking, while only 17.59% reported that they always add salt to the table. It is much more than what reported in another study i.e. in international study done by R.S. Newson *et al*, showed that Indian were adding salt during preparation being the main contributing source of salt in the diet was 48% and in other countries, China, and Brazil, the main source of salt in their diet was salt which was added during food preparation (42% across all countries) followed by salt from salt containing foods (30% across all countries), and then by salt added at the table, and salt from Out of Home foods (both sources reported by 14% across all countries), whereas in Germany/Austria, USA, Hungary and South Africa processed food was thought to be the main source of salt intake, and salt added during preparation was the second most rated main source of salt [14]. The difference may be due to regional variation and dietary practices.

48.50% of families often ate pickles/ papad/ lemon water. 40.34% of families were taking salt because of taste, 22.31% were doing it because of unawareness. In rural areas, people eat salted pickles in large quantities and, in some cases, still rely on the salting of food for preservation purposes. In urban areas, populations are making progressively greater use of chain restaurants and fast food outlets, which often add significant quantities of salt during food preparation [15, 16].

Table 1: Dietary Salt intake in different type of family

Type of family	Dietary salt intake		Total Number (Percentage %)	P Value
	<6 gms/day Number (Percentage %)	>6 gms/day Number (Percentage %)		
Nuclear family	16 (6.86%)	109 (46.78%)	125 (53.64%)	0.000002
Joint family	43 (18.45%)	65 (27.89%)	108 (46.35%)	
Total	43 (18.45%)	174 (74.67%)	233 (100%)	

X2=22.36, DF=1, p= 0.000002 highly significant

Table 2: Distribution of hypertension cases as per Socio-economic class and salt consumption\

Socio-Economic Class	Salt Intake		Total Number (%)	Total number of families having a case of hypertension	Percentages of families having a case of hypertension
	<6gm/d Number (%)	>6 gm/d Number (%)			
SEC-l	7 (3%)	25 (10.72%)	32 (13.73%)	7	3%
SEC-ll	6 (2.57%)	51 (21.88%)	57 (24.46%)	12	5.1%
SEC-lll	12 (5.15%)	56 (24.03%)	68 (29.18%)	18	7.7%
SEC-lV	17 (7.29%)	50 (21.46%)	67 (28.75%)	17	7.2%
SEC-V	4 (1.71%)	5 (2.15%)	9 (3.86%)	4	1.7%
Total	46 (19.74%)	187 (80.26%)	233 (100%)	58	24.9%

Note: SEC-Socio-economic Class

Table 3: Pattern of actual low salt intake in families as per knowledge of salt

Knowledge about high salt intake related health problems in families	Practice of low salt intake in their diet in families		Total Number (Percentage %)	P value
	Yes Number (Percentage %)	No Number (Percentage %)		
Yes	32 (13.73%)	50 (21.45%)	82 (35.19%)	0.0028
No	3 (1.28%)	11 (4.71%)	14 (6%)	
Don't know	25 (10.72%)	112 (48.06%)	137 (58.79%)	
Total	60 (25.75%)	173 (74.24%)	233 (100%)	

X2=11.72, DF=2, p=0.0028 significant

Table 4: Modes of salt intake and reasons for not want to decrease salt in diet

A. Modes of salt intake	Frequency	Percentage
Salt use during cooking	229	98.29%
Added salt intake		
Always	41	17.59%
Sometimes	25	10.72 %
Rarely	55	23.60 %
Never	112	48.06 %
pickles/ papad/ lemon water	113	48.50%
B. Reasons for not want to decrease salt in diet		
Taken right amount of salt	52	22.31%
They don't want to decrease	24	10.30%
Taste of food	94	40.34%
others	1	0.42%
Total	171	73.39%

6. Conclusion

People are still not aware of the harm of taking excess salt in diet which was evident in my study as a sizeable percent of population are suffering from hypertension. Adding extra salt or table salt in diet is a common practice in Indian household which is harmful. Preference for food with higher salt content which satisfy the taste buds of people is given more importance than their health benefits.

7. Recommendations

General population shall be made aware of ill effects of high salt intake in diet specially of hypertension which is due to more salt intake. Messages regarding this shall be added in school curriculum so that knowledge can spread to families through children and there is no need of changing the cooking practices. Promotion of the use of salt substitutes might also be an effective means of reducing sodium intake [17]. It's a baseline study to know about the pattern of salt consumption, this study can be further used with more stringent measures at individual levels so that issue of hypertension or NCDs can be properly addressed in relation to salt intake.

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