Research Article

Knowledge, attitude and practices regarding iodine deficiency disorders

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Received: May 22, 2017; **Accepted:** June 09, 2017

ABSTRACT

Background: A high level of awareness of iodine deficiency disorders (IDD) is very important for its prevention and control in the community. **Objective:** To study the knowledge, attitude and practices regarding IDD and the use of iodized salt in relation to IDD. **Materials and Methods:** A cross-sectional study was conducted in three areas of Khammam district, Telangana, India. A total number of households surveyed were 272. A structured knowledge and practices questionnaire was used to collect data from the head of the household. The data were collected with reference to knowledge, attitude and practices regarding IDD (its signs and symptoms, treatment and prevention, benefits of iodine, awareness of iodized salt, and sources of information). Descriptive analysis and Chi-square test were used to present the data. **Results:** In this study, only 26.1% of the households were aware of IDD. More than half of respondents (67.6%) had heard about iodized salt, the most common source of information being a television (51.5%). 96.3% of the households were using iodized salt. Of the total salt samples, only 10 samples (3.7%) have iodine content <15 ppm. Significant association was found between the awareness of IDD and education ($P < 0.001$), awareness about the benefits of iodized salt and the type of salt used ($P < 0.01$) while no association was observed between socioeconomic status and the type of salt used among the households. **Conclusion:** Although the use of iodized salt was more than 96%, more than half of the households lacked the knowledge about iodine deficiency diseases. There is a big gap between the awareness of the benefits of iodized salt and its consumption *per se*. Health education session on IDD and the benefits of iodized salt should be carried out with a special focus on illiterate people.

KEY WORDS: Knowledge; Attitude; Practices; Iodine Deficiency Disorder; Iodized Salt

INTRODUCTION

Iodine is an essential micronutrient required for the production of thyroid hormones which are crucial for brain and neurological development. Iodine deficiency causes a spectrum of diseases called iodine deficiency disorders (IDD), which affect all stages of life from early pregnancy to the adult. World Health Organization (WHO) considers iodine deficiency to be "the single most important preventable cause of brain damage" the worldwide. IDDs are associated with many thyroid related diseases including mental and physical retardation (cretinism), spontaneous abortions, stillbirths, congenital abnormalities, birth defects, delayed growth and puberty, hypothyroidism, goiter, and infertility.[1-3] Furthermore, the social and economic impact of IDD is significant, with iodine deficiency resulting in lower intelligence quotient, productivity and student achievement.

Access this article online	
Website: http://www.ijmsph.com	**Quick** Response code
DOI: 10.5455/ijmsph.2017.0515009062017	

Globally, about 2 billion people exposed to the risk of IDD, of whom more than 655 million people are already affected by IDD.[4] In India, about 167 million people live at risk of IDD, of whom 54 million suffer from goiter, 2 million suffer from cretinism, and 6.6 million children have neurological deficits.[5] Surveys conducted in various states of India showed that no state in the country is free from IDD.[6] Over the past two decades, salt iodization has been introduced in many countries including India as a safe, cost-effective, and sustainable way to eliminate IDDs. Universal salt iodization (USI) is accepted as the most important public health measure for the elimination of IDD. The proportion of households consuming adequately iodized salt (at least 15 ppm at the household level) in Andhra Pradesh has increased from 31.5% in 2005 to 63.5% in 2009, showing the positive impact of USI in Andhra Pradesh.[7]

Although the problem of IDD exists and universalization of the iodized salt program has been accepted in Khammam, no information is available regarding the knowledge, attitudes and practices of the people toward this problem. Therefore, this study was undertaken with the objective to assess the baseline information on these aspects, i.e., to explore in more detail the knowledge related to IDD and the health benefits of iodine, attitudes and practices relating to storage and use of iodized salt in the community.

MATERIALS AND METHODS

Study Design and Study Area

This was a cross-sectional study conducted from September 2016 to March 2017 in three areas of Khammam district, Telangana, India. All households in these areas were interviewed for the purpose of the study. The total number of households covered were 272; of which 90 from Sweeper's Colony, 66 from B. K. Bazaar, and 116 from Nizampet. A structured knowledge and practices questionnaire was used to collect data from the head of the household. If the head of the household was not available, the next seniormost member available was interviewed.

Data Collection Techniques and Tools

The information obtained from the subjects included sociodemographic characteristics, knowledge about IDD, benefits of iodine, iodized salt awareness, salt purchasing and consumption habits, and type of salt consumed. The interviews were conducted in the community. Community social workers assisted in locating the subjects' residential address in the community. Before starting the interview, each respondent was explained in brief about the need and purpose of the study. The importance for their cooperation for the success of the study and possible benefits to the community through the findings of the study were emphasized. A total of 272 salt samples were collected. The salt samples were tested for the estimation of iodine with the help of MBI kits. The cutoff proportion of 15 ppm and above was considered as adequately iodized salt using WHO/United Nations International Children's Education Fund reference indicators for monitoring of iodized salt.[1] The study protocol and questionnaire was approved by Institutional Ethical Committee at Mamata Medical College and Hospital. The informed consent was obtained from each interviewee before enrolment in the study and confidentiality of the information was maintained throughout the study.

Statistical Analysis

Data were entered and analyzed using SPSS version 18.0 (SPSS Inc, Chicago, IL). Frequency, percentage, and arithmetic mean and median were used to present the data. Appropriate tests of significance (Chi-square, Student's *t* and *F*-tests) were applied wherever necessary at the 5% level of significance. A $P < 0.05$ was considered as statistically significant at 95% confidence level.

RESULTS

Of the 272 respondents, 65.8% were females, 67% completed secondary school, 70.9% were employed, and 76.8% were married. The sociodemographic characteristics of respondents are shown in Table 1. The mean age was 35 years (median 30, range 16-70). The mean age of males and females was 37.9 years and 33.7 years, respectively, the difference being statistically significantly ($P < 0.05$).

Among the 272 households surveyed for the study, only 26.1% of the households were aware of IDD. The awareness rates of the benefits of iodine (prevents goiter, helps for growth and development and for brain development as mentioned by respondents) were very low (23.5%). Majority of the households (96.3%) were using iodized salt as shown in Table 2. Rest of the households was using either open salt or crude salt. The reasons of not using the iodized salt were mainly habit, parent's decision and changing the taste.

More than 90% of the households stored the salt in closed containers. The awareness rates of the households with respect to iodized salt were low (67.6%), the most common source of information being a television (51.5%) followed by a newspaper (13.6%). Around 11% of the households came to know about iodized salt from health workers as shown in Figure 1. The association between the awareness of IDD and the education status of the household was statistically significant ($P < 0.001$). The type of salt used was significantly affected by the knowledge about the benefits of iodized salt ($P < 0.01$) as shown in Figure 2.

DISCUSSION

This study was conducted to assess the knowledge of IDD and the utilization of iodized salt in a new urban township in India to monitor the progress of National IDD Control Programme. In this study, it was observed that though the iodized salt was used by nearly all households, more than half of the subjects lacked the knowledge about IDD. There is a big gap between the awareness of the benefits of iodized salt and its consumption *per se*.

Table 1: Sociodemographic characteristics and IDD awareness of the households

Characteristics	*N* (%)
Age	
≤30	139 (51.1)
>30	133 (48.9)
Sex	
Female	179 (65.8)
Male	93 (34.2)
Completed secondary school	
No	90 (33.0)
Yes	182 (67.0)
Marital status	
Single	63 (23.2)
Married	209 (76.8)
Occupation	
Non-working	79 (29.1)
Working	193 (70.9)
Number of household members	
≤5	240 (88.2)
>5	32 (11.8)
Per-capita income (INR)	
≤2000	69 (25.4)
>2000	203 (74.6)
Awareness about IDD	
No	201 (73.9)
Yes	71 (26.1)
Awareness about benefits of iodine	
No	208 (76.5)
Yes	64 (23.5)
Knows about iodized salt	
No	88 (32.4)
Yes	184 (67.6)
Storage of salt	
Container with lid	246 (90.4)
Container without lid	26 (9.6)

IDD: Iodine deficiency disorders

This study revealed that very few (26.1%) of the households was aware of IDD and only 23.5% of the households were aware about the benefits of iodine. On the other hand, a study conducted by Yu et al.[8] observed that the awareness rates of IDD and the benefits of iodine were 68.7% and 61.9%,

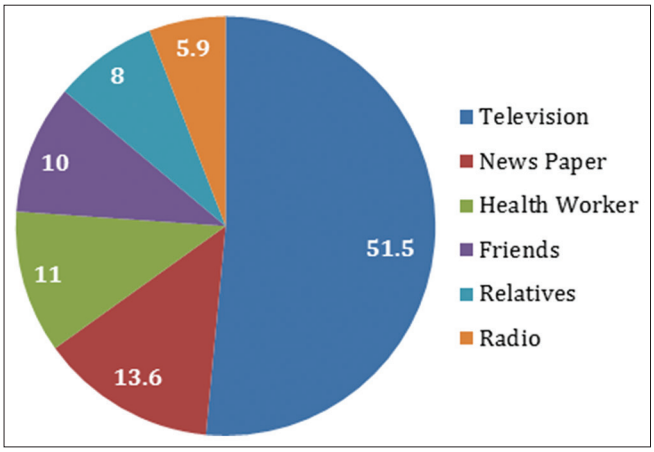

Figure 1: Sources of information regarding iodized salt among the households

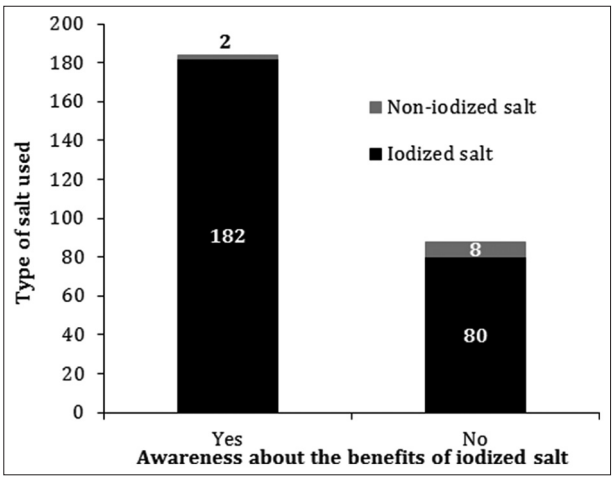

Figure 2: Iodized salt use among the households in relation to awareness about the benefits of iodized salt

Table 2: Distribution of iodine content of salt at household level

Zone	Number of salt samples	Iodization of salt in ppm		Percentage of salt samples adequately iodized
		<15	≥15	
Sweepers colony	90	4	86	95.6
B. K. Bazaar	66	4	62	93.9
Nizampet	116	2	114	98.3
Total	272	10/272	262/272	96.3
		3.7%	96.3%	

respectively. Our study found that 96.3% of the households were using iodized salt. The coverage is above what is recommended by international organizations, that is, 90% or more households should consume adequately iodized salt for optimum iodine nutrition in a given community.[1] Therefore, it is confirmed that the iodine status of the households in our study is generally adequate according to the WHO criteria. Our results are in conformity with the already published report of the Coverage Evaluation Survey[9] which revealed that 91% population was using iodized salt. Although the awareness rates of the households in relation to the benefits of iodine were very low, a higher proportion of them were found to use iodized salt indicating that many use iodized salt without realizing its benefits. In this study, the reasons for not using the iodized salt were mainly habit, parent's decision and changing the taste. Agarwal et al.[10] in his study reported low cost and a better taste as the reasons for the utilization of non-iodized salt. In our study, we found that 96.3% of salt samples have iodine level >15 ppm. This shows that USI in being successful in Khammam. In contrast, a study by Kumar et al.[11] reported that only 39.2% of total salt samples had iodine levels >15 ppm. In this study, the common source of information in relation to iodized salt was television (51.5%) followed by newspaper (13.6%). Similarly, television (66.7%) was the principal source of information in a study by Sen et al.[12] Our study revealed that 14% of the households knew that iodine deficiency results in goiter. In a similar study by Strange et al.[13], it was found that only 39.7% of the people in Andhra Pradesh knew that iodine deficiency results in goiter. Surprisingly, in the above study, it was observed that 70.3% of the people in Andhra Pradesh knew iodine deficiency can result in less physical development or stunted growth. The households who were aware about IDDs and iodized salt were used to consume a significantly higher proportion of iodized salt compared to those who did not (92.9% vs. 73.6%). Similar results were reported by a study conducted by Sen et al.[12] in West Bengal (81.3% vs. 68.7%).

The strength of our study is that all the household salt samples were tested for the estimation of iodine content using MBI kit. In this study, we observed three limitations. First, we lack information about the amount and sources of iodine intake which would have given a more complete picture of the iodine nutrition in the study population. Second, the measurement of iodine status at one time-point might not represent dietary iodine intake in the long-term. Finally, the selection of three areas for the purpose of the study limits the generalization of the results to the whole population.

CONCLUSION

In conclusion, this study showed that though the iodized salt was used by nearly all households, more than half of the subjects lacked the knowledge about IDD. There is a big gap between the awareness of the benefits of iodized salt and its consumption *per se*. This can be improved by generating awareness among the households about the health benefits of consuming adequately iodized salt and its role in the prevention of IDD. These community-based awareness programs should be tailored according to the sociodemographic characteristics of the households with a special focus on illiterate people.

ACKNOWLEDGMENTS

We profusely thank community social workers at the study sites for their support in this work and interns for their participation in collecting the data. We also thank all the participants for sharing their experiences with us.

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How to cite this article: Konda S, Kumar RBP, Giri PA. Knowledge, attitude and practices regarding iodine deficiency disorders. Int J Med Sci Public Health 2017;6(8):1297-1301.

Source of Support: Nil, **Conflict of Interest:** None declared.