Effectiveness of Health Education in promoting the use of Iodized salt in Lotkoh, Tehsil Chitral, Pakistan

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Abstract

Introduction: We evaluated the effect of health education on the use of iodized salt in a remote region.
Methods: We randomly selected 31 villages in teh Lotkoh tehsil of district Chitral in the North West Frontier Province of Pakistan. We then randomly selected 7 households from each village and inteviewed the eldest women of the family. We also tested samples of salt for iodine concentration at the user's level.
Results: Eighty-five percent of families (184/ 217) used iodized salt exclusively. Among the samples population, the Aga Khan Health Services (AKHS) informed 67% about the importance of iodized salt. Shopkeepers and neighbors informed 25%. People informed by AKHS were more likely to know the volatile nature of iodine (76% vs 55%, p<0.001) and the advantages of iodized salt (91% vs. 75%, p = 0.001) than persons informed by other sources. People who could name any single advantage of iodized salt were more likely to use iodized salt (97%) compared to those who could not name any advantages (62%) (p<0.001) Iodine concentration in 78% (141/183) samples was acceptable (?l5ppm). One specific bran.d of salt consistently had suficient iodine concentration (91%) compared to all others (47%) (p<0.00l).
Conclusion: Health education has been effective in promoting the use of iodized salt in these isolated rural communities. A joint effort by the government, local NGOs and the community can substitute the role of mass media in such areas. Regular evaluation of iodized salt brands should be considered (JPMA 50:296, 2000).

Introduction

Iodide, a substrate for thyroid hormone synthesis, plays an auto-regulatory role in the metabolism of the thyroid gland. The minimum daily requirement of iodine is l50-200ug to replace renal losses, Iodine deficiency is a rare occurrence in the iodine replete western world but remains the most common cause of endemic goiter in the world[1]. A diet deficient in iodine causes a wide spectrum of illnesses collectively termed iodine deficiency disorders which affect people of all ages, but particularly pregnant women, the developing fetus and neonates[2].

Iodine deficiency disorders, including cretinism and goiter, have been a major problem in the northern areas and Chitral, for many years[3]. McCarrison, in 1908, estimated that 80% of the population in Gilgit & Chitral had visible goiters, while cretinism was an endemic problem[4]. A survey in 1960 showed a 76% goiter prevalence rate in school children and a 1972 survey of a village near Gilgit showed an 82% goiter prevalence rate in the persons aged 10-20 years. In 1990, a survey of goiter prevalence among three tehsils, i.e., district sub-units, in the Northern areas (Nagar, Yasin and Punia!) and one in Chitral (Lotkoh) carried out by the Planning and Development Division of the government of Pakistan, showed 43% goiter prevalence in Nagar. 39% in Yasin, 18% in Punial and 12% in Lotkoh (Chitral) among all age groups[5].

lodination of salt is a simple process that can be carried out by salt manufacturers and small-scale entrepreneurs. Salt should be iodinated to a level of at least 50 mg of iodine per kg of salt. i.e., 50 parts per million (ppm) so that, after making allowance for losses of iodine during storage and distribution, the salt contains not less than 15mg/kg of iodine. In India, the average per capita consumption of salt is

10 gms/day, so the salt with an iodine content of 15mg/kg or ppm, would therefore satisfy the recommended daily requirement of I 50p.g of iodine[6].

Since 1988. the Pakistan government, the Aga Khan Health Services (AKHS). and other non-government organizations (NGOs) have been working to promote the use of iodized salt in Chitral. AKHS started arranging health education sessions and formal teachings as an important objective of their health center program in 1991. AKHS staff provides health education during the health center visits of the mothers, during special sessions organized with the village organizations and the women organizations, in religious gatherings, during immunization services and by motivating the people with the help of community health workers and traditional birth attendants. Being a very remote area, Lotkoh tehsil has a low level of literacy. There is no direct television transmission in this area and no day-time radio transmission. Thus, these media are unable to play their role in providing health education to promote the use of iodized salt.

Moreover, knowledge and motivation to use iodized salts is not sufficient to ensure sufficient iodine intake. Regular monitoring of iodine content of the salt at the consumer level is also essential for the elimination of iodine deficiency disorders. The feasibility of NGOs in monitoring the iodine content of the salt was studied in Uttar Pardesh, Northern India, where iodine deficiency disorders are endemic. A total of 4001 salt samples were collected from households and shops; and were analyzed at the regional laboratories. Almost 80% of the samples contained less than the minimum recommended leveIs 18% contained no iodine at all[6].

We conducted a study to assess the prevalence of use of iodized salt, knowledge among consumers about its advantages, reasons why some families were still not using it and to evaluate whether there were differences in knowledge and practices among families informed through the Aga Khan Health Services educational programs versus those reached through other means. We also tested various brands of iodized salt, for their content of iodine, at the consumer level.

Methods

Site: Lotkoh tehsil in district Chitral in the North West Frontier Province of Pakistan, has a total population of 30000. Chitral city, the headquarter of district Chitral, is about a 12 hour drive from Peshawar, the provincial capital. Both the road and the aerial route remain closed for the six months of winter during which time the area has no communication with the rest of the country. Lotkoh tehsil includes 188 small scattered villages served by five Aga Khan Health Services health centers. AKHS has two Lady health visitors in each of its health centers. These lady health visitors work in the communities with the help of 112 community health workers, 85 traditional birth attendants and the field teams, which include a health technician and a dispenser.

Survey population: All the 30000 people (approx. 5000 families) living in 188 villages of Lotkoh tehsil were taken as our target population. Taking lack of health education as a risk factor for not using iodized salt, with a confidence interval of 95%, power of 80%. ratio between unexposed to exposed as 1:5 and risk ratio of 2.0, our sample size was calculated to be 222 families. Balancing the objective of diversity with the limitation of time and difficulty in reaching villages, we ultimately selected 31 villages and 7 households within each village to be interviewed. This made our total sample size equal to 217. The names of all the 188 villages were listed in a alphabetical order and every sixth village was selected. Then all the families living in these sampled clusters were listed according to their house numbers, from the data available in the health centers or with the community health workers. Seven households were selected randomly using random number tables. For some villages, where there were less than seven houses, extra households were interviewed in other villages.

Study design and variables: The study design was cross sectional. The senior lady health visitor or the field staff along with a local traditional birth attendant or community health worker visited the sampled clusters and the households. Simple questionnaires were designed in Urdu, the national language of

Pakistan, that were completed by the trained staff according to the answers given by the eldest woman of the family who culturally has the most decision making powers in such household matters. Questions were asked about the type of salt being used in the household, brand of iodized salt used, source of information about the iodized salt and the advantages of using iodized salt. Then the survey team itself checked, if the salt in the household was kept covered or not. In addition, the salt was tested for the quantity of iodine (in ppm) in each household by a portable colimetric field kit, a technique which in a previous setting performed favorably compared to standard titration methods[7]. We analyzed the data using frequencies and compared differences between groups using the prevalence ratio, and 95% confidence interval. We used Chi square to assess the statistical significance of associations.

Results

All 17 families agreed to be interviwed. Eighty-Five percent (184/217) of the families reported using iodized salt only,ranging from 69% in the area of Garam Chashma health center to 97% in that of Shoghor health center.Another 6% (14/2 17) of the families reported using both the iodized salt as well as rock-salt.

Almost 94% (204/217) of the families interviewed were aware of their source of information regarding the benefits of iodized salt use. Among the population who knew their source of information, AKHS had informed 67% (136/204) of them about the advantages of iodized salt. Shopkeepers and neighbors had informed 25% (50/204) of the population. Government staff, electronic media and missionaries informed 2% (5/204), 3% (7/204) and 3% (6/204) of the population respectively.

AKHS staff informed people in the range of 100% 183(100) (27/27) inArkarihealth center area to 38% (13/34) in the area of Shoghor health center, about the importance of iodized salt. Other important sources were shopkeepers and neighbors or educated people of the community, who had informed up to 50% of the people in Shoghor.

People who were informed by the AKHS staff were no more likely to use iodized salt than those informed by other sources about the advantages of iodized salt (94% vs 91%, p=0.44) (Table I). Similarly, people not directly related to the health services like missionaries, shopkeepers and neighbors were as effective as the skilled staff e.g., AKHS staff and the government staff in convincing the people to use iodized salt in their houses. (92% vs 90%, p-value=0 .3 5).

People who were informed by the AKHS staff were more likely to keep iodized salt covered (76% vs 55%. p<0.001). to know that it prevents goiter (79% vs. 62%, p=0.007) and to be able to list at least one advantage of iodized salt (91% vs. 75%, p<0.00l) compared to persons informed by other sources (Table 1).

Table 1. Knowledge and practices about the use of iodized salt among people informed by different sources in Lotkoh tehsil, Chitral, Pakistan 1996.

	Informed by AKHS*	Informed by others*	Prevalence ratio	p-value
Used iodized salt	94% (127/135)	91% (62/68)	1.0	0.4
Kept iodized salt covered	76% (101/133)	55% (36/65)	1.4	<0.001
Knew it prevents goiter	79% (108/136)	62% (42/68)	1.3	0.007
Could list 3 advantages of iodized salt	12% (16/136)	3% (2/68)	4	0.03
Could list at least 1 advantage of iodized salt	91% (124/136)	75% (51/68)	1.2	0.001

People who were aware of any one advantage of iodized salt, were more likely to use iodized salt (97% vs. 62%, p<:.001 1) and also to keep it covered because of the volatile nature of iodine (72% vs 52%, p= 0.03) compared to those who did not know any advantage (Table 2).

Table 2. Relationship between iodized salt use practices and people's knowledge of any single advantage of iodized salt, in Lotkoh tehsil, Chitral, Pakistan 1996.

	Knew at least 1 advantage*	Did not know any advantage*	Prevalence ratio (PR)	p-value
Used iodized salt	97% (170/175)	62% (23/37)	1.6	<0.001
Kept iodized salt covered	72% (123/171)	52% (14/27)	1.4	0.03
Using iodized salt in meals + tea	96% (164/171)	54% (20/37)	1.4	<0.001
Using iodized salt in meals only	0.6% (1/171)	8% (3/37)	0.07	0.002

Upon testing, 77% (142/183) of the total samples contained acceptable concentration of iodine (>1 5ppm). One brand of iodized salt (Brand A) contributed most to this number (91% vs 47%, pK0.001) as compared to all the other 18 brands available in the market (Table 3).

Table 3. Content of iodine in various brands of iodized salt tested in households in Lotkoh tehsil, Chitral, 1996.

Iodine content Range (ppm)	Brand A No. (%)	Others No. (%)	Total No. (%)
0-6.9	4 (3)	19 (33)	23 (13)
7-14.9	7 (6)	11 (19)	18 (10)
15-29.9	36 (28)	12 (21)	48 (26)
30-49.9	29 (23)	6 (11)	35 (19)
50 or >	50 (40)	9 (16)	59 (32)
Total	126 (100)	57 (100)	183(100)

No significant difference was found in the storage practices of people using different brands of iodized salt; 60% (75/125) of the people using Brand A kept the salt in closed jars compared to 57% (41/72) of those using other brands of iodized salt.

Discussion

Health education provided by different sources, has been largely successful in promoting the use of iodized salt in this remote region, as 92% of the families in Lotkoh tehsil are now using iodized salt as

compared to the government of Pakistan's claim of 19% all over the country[8]. This has been possible in most of the areas, because of the well organized network of community based staff provided by the AKHS, who are playing an important role in passing the key health education messages to the community. The shopkeepers and educated people of the community, have also been an important source of health education in that area. Outreach services by the government staff role of electronic media and that of the missionaries needs to be improved. The quality of education provided by the AKHS staff has been satisfactory as the people informed by them have a better understanding of the advantages of iodized salt than the people informed by other sources. Most of these people also keep the salt covered knowing the volatile properties of iodine.

This shows that an organized community based program by a non-governmental organization, even in the absence of electronic media and support from the government health staff can play an important role in conveying important health education messages to communities at risk. Improvement in the knowledge of the consumers, shop-owners and manufacturers, about the advantages of iodized salt is an important contributor to the increase in iodized salt consumption.

Efforts to promote fortified products, especially the iodized salt, in developing countries have identified various problems that need to be addressed. First, many firms do not purchase brands of salt having proper iodination, transportation and storage, probably because the refined salt is costlier and less popular than the coarse salt. Second, transport of iodized salt to the remote areas, especially mountainous regions, takes an unusually long time, and is usually done in open wagons. which exposes the salt to sun and rain. Another problem is the storage of iodized salt in open jars and earthenware pots, which results in further loss of volatile iodine. All these factors contribute to the low concentration of iodine at the household level. In our study also, except one brand, all the other brands were having sub-normal concentration of iodine in most of their samples. Fortunately, the majority of the population is also using this brand. AKHS is also selling the same brand through its sell-point in Gararn Chashma (the headquarter of Lotkoh tehsil). Still there is a need to inform the people using other brands about the facts, or to contact the dealers or manufacturers of those brands to emphasize them to improve the quality of their products[9].

To achieve universal promotion of iodized salt, the government of Pakistan has already introduced a strategy to encourage this type of salt intake through the mass media. But there are many high risk areas like Lotkoh tehsil, which are not reached by the mass media. These areas need a more targeted approach to get this message through to the people. The government health staff working in those areas should be motivated to spread this message. They can do this not only to the people coming to their health centers, but also to the people living in the nearby areas during their outdoor visits. This evaluation shows that the local NGOs like the AKHS, can play a crucial role in motivating the people to use iodized salt through their community based volunteers and staff Government and the NGO's should also work to motivate shopkeepers and the religious leaders of the area to play their role in spreading this crucial health message. All these groups together can successfully substitute that of the mass media.

While it is possible that people may be using iodized salt because of secular trends that are unrelated to specific efforts at health interventions, the strong association between knowledge about the advantages of iodized salt quality of supplemented products. and its use, and the lower level of use in the areas where the services of AKHS have been started recently suggest that the community based efforts by AKHS have contributed. The Aga importantly. Another limitation in this analysis could be Khan Health Services for Chitral, Pakistan for his help and that a few salt samples collected at a single point in time support in planning this study and providing us with the might not be truly representative of the actual quality of that vehicles to reach the difficult mountainous areas of Lotkoh brand. However, despite similar storage practices, only one tehsil, Chitral.brand consistently had adequate iodine concentrations.

The role of an NGO or the government, committing to improve the knowledge and use of iodized salt in the community, needs to provide both community based health education about the advantages of it and regular monitoring of the salt samples for their content of iodine. Communities should be informed about the iodine content in various brands of the iodized salt so that they spend their money for the right thing. Shopkeepers can also be advised to promote the use of iodized salt by not keeping the rock-salt in their shops. They should also be advised to keep the brand that has shown to be most effective and consistent in containing the highest quantity of Iodine in their samples. In the difficult mountainous regions like Chitral, where electronic media cannot play its role and it is difficult for the government services to reach to the people, the local NGOs, shopkeepers and the missionaries can play a vital role in giving health education to the people and monitor the quality of supplemented products.

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