

Original Research Article

Nutritional status vis-a-vis iodine deficiency in children of "Save Our Soul" children's village in rural Varanasi: a micro-level study

Madan M. Majhi, Chandra P. Mishra*, Prem Shankar, Zoobi Khanam

Department of Community Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi 221005, Uttar Pradesh, India

Received: 08 May 2017

Accepted: 05 June 2017

***Correspondence:**

Dr. Chandra P. Mishra,

E-mail: drcpmishra@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: There is paucity of data with regard to the Iodine deficiency in an organized sector like SOS children's village which is an independent, non-governmental, social development organization located in urban Varanasi. Uttar Pradesh is one of the endemic states for goiter. It is expected that similar situation of goiter may prevail in children as well. It is a matter of concern that micro nutrient deficiency and under-nutrition may exist side by side. The objectives of the study were to assess nutritional status and find out the extent of Iodine deficiency in the study subjects, to find out the association between under nutrition and Iodine deficiency and to find out the Iodine content of salt used for cooking in the family.

Methods: 118 children of age group 6 to 15 years, from a Non-Governmental Organization (Save Our Soul) in Rural Varanasi constituted materials of the study. Consent from the director of the institution and assent from the individual children was taken prior to examination. All the subjects were examined clinically for the Presence of Goiter. They were subjected to weight and height recording following standard technique. Salt samples from the houses were tested by spot Iodine detection kit.

Results: In case of 72.6% female and 91.3% male subjects, BMI for age was <100% of the respective reference values; in all 76.3% subjects belonged to this category. Presence of Goiter among male children was 34.7% and among female children it was 22.2% and overall it was 24.6%. Significant association was observed between nutritional status and iodine deficiency ($p < 0.05$). In 37.5% of salt samples, iodine content was 7 ppm and rest 62.5% shows iodine content 15ppm.

Conclusions: Nutritional status of the children under reference was far from being satisfactory. High prevalence of Goiter is matter of serious concern. Iodized salt consumption in the houses was up to the mark but Iodine content of the salt samples from houses was not satisfactory.

Keywords: Goiter, Iodized salt, Iodine deficiency disorder, SOS children's village

INTRODUCTION

IDD in community level

Malnutrition (both under and over nutrition) is currently one of the biggest challenges being faced by the modern

world. Micronutrient deficiencies, more commonly referred to as "hidden hunger", form a significant component of burden of malnutrition worldwide, more so in developing countries like India. Deficiencies of iodine, iron, folic acid, vitamin A and zinc are the leading five causes of micronutrient deficiencies which constitute a global public health problem.¹

Iodine deficiency is the world's single greatest cause of preventable mental retardation. It is especially damaging during the early stages of pregnancy and in early childhood.² Iodine is an essential component of thyroid hormones, which are needed for optimal mental and physical development and regulation of body metabolism (generation and utilization of body energy).

Iodine deficiency disorders (IDD) are linked to iodine deficient soil. Due to glaciations, flooding, rivers changing course and deforestation the iodine present in top soil is constantly leached and exposing the Iodine-poor layer beneath. This in turn leads to deficiency of iodine in crops grown on iodine deficient soil with consequently low iodine in the diet for livestock and humans. In the past, iodine deficiency was thought to cause only goiter and cretinism. However, over the last quarter of the century, it has become increasingly clear that iodine deficiency leads to a much wider spectrum of disorders commencing with the intrauterine life and extending through childhood into adult life with serious health and social problems. The spectrum of diseases includes goiter, cretinism, hypothyroidism, brain damage, abortion, still birth, mental retardation, psychomotor defects and hearing and speech impairment. Majority of consequences of IDD are invisible and irreversible but at the same time preventable.³

Globally, two billion people are at risk of iodine deficiency disorders due to insufficient iodine intake. Nearly 266 million school-aged children worldwide have insufficient iodine intake. Of the 130 countries which reported data for IDD in 2006 (comprising 91.1% of the total global population), IDD was a public health problem in 47 countries.⁴

In India, the entire population is prone to IDD due to deficiency of iodine in the soil of the subcontinent and consequently the food derived from it. Of these, an estimated 350 million people are at risk of IDD as they consume salt with inadequate iodine.⁵ Globally, India has the largest number of children born vulnerable to iodine-deficiency.⁶

Iodine deficiency disorder (IDD) has been recognized as a public health problem in India. An estimated 167 million people in India are at risk of IDDs. Of these, 54 million suffer from goiter, 2 million suffer from cretinism, and 6.6 million children have neurological deficits.⁷ Surveys conducted in various states showed that no state in the country is free from IDD.⁸

Surveys conducted by the Central and State Health Directorates, Indian Council of Medical Research (ICMR) and medical institutes since 1950s have clearly demonstrated that IDD is a public health problem in all States and union territories in India. Of the 325 districts surveyed in India so far, 263 districts are IDD-endemic, i.e. the prevalence of IDD is above 10 per cent in the population.⁹ As per the survey conducted by the National

Nutrition Monitoring Board (NNMB) in 2000-2001 in rural areas of Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Madhya Pradesh, Orissa and West Bengal, the overall prevalence of total goiter rate among 6-12 years old children was about 4%.¹⁰ The prevalence of goiter was highest in Maharashtra (11.9%) and West Bengal (9%).

In 1962, the Government of India initiated a National Goiter Control Program (NGCP), primarily aiming at covering endemic population and endemic areas with iodized salt. In 1992, the Government of India intensified organized efforts with the change of 'National Goiter Control Program' to 'National Iodine Deficiency Disorders Control Program' (NIDDCP) to reflect broader aspects of iodine deficiency. It led to the initiation of compulsory salt iodization in 1998. The compulsory salt iodization program included a ban on the sale of non-iodized salt. The ban on non-iodized salt went against a number of local business interests. In the year 2000, it was revoked considering "compulsion in such matters of individual choice undesirable".¹¹

India, as one of the participants of the United Nations General Assembly Special Sessions (UNGASS) on children had committed to the goal of IDD elimination by 2005. However; India subsequently revised the IDD control goal in 2006. The IDD control goal in India was to reduce the prevalence of IDD (i.e. total goiter rate) below 10 per cent in the entire country by 2012.¹²

In a context where iodization is not universal, the progress of programs to prevent iodine deficiency need to be monitored using indicators recommended by WHO, UNICEF and ICCIDD (Table 1).¹³

Table 1: Indicators for monitoring prevention of iodine deficiency disorders.

Indicators	Goals (%)
Thyroid size (in school children 6-12 years of age)	Enlarge thyroid by palpation or ultrasound <5
Urinary iodine concentration	Below 100µg/L <50
	Below 50µg/L <20
Salt iodine content	Households consumption of iodized salt >90

By adopting, Universal Salt Iodization (USI) as the preferred strategy to achieve the goal of IDD elimination, impressive gains have been made in household-level coverage of adequately iodized salt (more than 15 parts per million of iodine content) globally. Salt iodization programs have been implemented in many countries of the world, currently 145 countries worldwide have implemented USI and over two-thirds of the global population i.e.71 per cent of the population worldwide consumes adequately iodized salt.¹⁴

Though, universal salt iodization (USI) was made mandatory in the country from 2005, only 71% of households were consuming adequately iodized salt as per the Coverage Evaluation Survey, 2009.¹⁵ As per this report, 91 per cent of households had access to iodized salt, of which 71 per cent consumed adequately iodized salt. Another 9 per cent consumed salt with no iodine. There are wide rural and urban variations in household coverage of adequately iodized salt (83.2% in urban areas vs. 66.1% in rural areas). Wide variation was also seen across different States/UTs; with Chhattisgarh (31.6%), Karnataka (35.5%) and Jharkhand (41.4%) being the low coverage States and Manipur (98.3%), Meghalaya (98%) and Nagaland (97.1%) being high coverage States.

IDD in organized, residential sector

Though, there are many studies available in the community setup supporting linkages of iodine deficiency in children in the age group of 6-12 years throughout the country. There is paucity of data with regard to the Iodine deficiency in an organized sector Like SOS Children's village where it is intended to provide the family based care at par with children's own family, to the parentless or abandoned children by providing them with a mother and home surrounded by residential environment simulating a village.

SOS children's village

SOS (Save Our Soul) children's villages is an independent, non-governmental, social development organization that provides family-based care for parentless or abandoned children. It advocates the concerns, rights and needs of children in need of care and protection. First SOS children's village was founded by Dr. Hermann Gmeiner in 1949 in Imst, Austria. He was committed to help the children in need who have lost their family support as a result of World War II. During his visit to India in 1962, the then Primary Minister Mr. Jawaharlal Nehru was greatly impressed by the vision and mission of Dr. Hermann Gmeiner and subsequently first SOS Children's village in India was established in Greenfield location of Delhi, in 1963. SOS movement now spread across more than 132 countries all over the world. Since its inception in 1964 in India, SOS children's village spreads its care and affection to the child in need in more than 32 villages across the countries along with its allied projects.¹⁶

SOS children's village Varanasi

It was established in the year 1984 and dedicated to the nation on February 23, 1985, has completed 32 years of service in childcare. The Village, located in Khirbhavani, Daniyalpur Chaubeypur, Varanasi 221104, Uttar Pradesh, in a rural area about 25 km from the city of Varanasi, is home to abandoned and parentless children comprising of total 16 houses. There is paucity of data with regard to the Iodine deficiency in an organized sector Like SOS

Children's village. Spectrum of Nutritional needs and health status of these specialized group children may vary from the main stream children who are living along with their own biological parents in their own houses. It is expected that similar situation of goiter may prevail in these children as well, also when it comes to deprived and under privileged children, it is a matter of concern that micro-nutrients deficiency and under-nutrition may exist side by side.

With this background, a study was conducted in the month of December, in the children of age groups 6-15 years in the SOS children's village, Varanasi, with the following objectives:

- To assess nutritional status and find out the extent of Iodine deficiency in the study subjects
- To find out the association between under-nutrition and Iodine deficiency
- To find out the Iodine content of salt used for cooking in the family.

METHODS

Study was carried out at SOS Children's village, in Khirbhavani, Daniyalpur Chaubeypur, Varanasi 221104, Uttar Pradesh, India.

Study sample

There were 118 children in the age group of 6-15 years in SOS Children's village, Varanasi. All the 118 children constituted the study sample and cross-sectional design was adopted for the study.

Tools of the study

Predesigned and pretested proforma, weighing machine, Steel anthropometric rod and I- check salt Iodine testing kit (Supplied by State Government) were the tools used in the study.

Techniques

Prior consent from the Director of the SOS Children's village and assent from the individual children was taken. All the subjects were examined clinically for the signs of iodine deficiency (presence of goiter). The study subjects were asked to sit comfortably and neck was initially inspected for presence of any swelling in sufficient natural light then palpated to find out any obvious enlargement of thyroid gland. The subjects were then given water to drink and movement of the swelling was observed. Thyroid swelling was confirmed by movement during deglutination. Also, the gland was palpated for its extension and presence of any nodules. The grading of Goiter was done as per the joint recommendation by WHO, UNICEF and ICCIDD guideline.¹³ According to the joint recommendation Goiter was classified into 3 grades. (Grade 0, not palpable and not visible; Grade I,

palpable but not visible; Grade II, palpable and visible). Then overall prevalence of goiter was estimated by considering the Goiter grade I and II only.

Weight was recorded by asking the child by stepping up onto the weighing machine placed on horizontal surface and stand still over the center of the scale with body weight evenly distributed between both feet without shoes and with minimum clothing the hands hanging freely on either side of the body and the palm facing towards the thigh with head holding in anatomical position and face forward. Weight was recorded to nearest possible fraction of grams. Accuracy of weighing machine was ensured time to time with known weights.

Height was recorded by standing position, the children were asked to stand with their back against the road in horizontal plane. It was ensured that the weight of the child should be evenly distributed on both feet. The children were asked to place the legs together. They were instructed to stand erect (stand up straight and look straight ahead). Then the head is positioned in the Frankfort Horizontal Plane. The moveable headpiece is brought onto the upper most (superior) point on the head with sufficient pressure to compress the hair. The measurement is recorded to the nearest mm. BMI was then calculated of all the children using the formula, weight in kilogram divided by height in meter square.

Salt sample from the 16 houses of the village was tested with spot Iodine testing kit. 2 spoons full of salt sample was taken in a plate then 2 drops of test solution were added to the salt and development of color was noted and compared with the accompanying color chart provided by the manufacturer in the box. Out of 16 salt samples from 16 houses 6 samples indicated the color that was depicted for 7ppm and in 10 houses indicated as the color depicted for 15ppm. However, salt sample from the new packets

which were not opened but present as stocks in all the houses were of 15ppm.

Analysis of data

Data thus obtained was entered in personal computer in Microsoft Excel 2010 and analyzed using SPSS version 16.0.0 for windows. Chi-square test was applied as a test of significance.

RESULTS

Under nutrition

In all 118 study subjects 95 (80.5%) are female and 23 (19.5%) are male. Out of 118 study subjects in 76.3% BMI for age was less than 100% of the WHO reference value, and in 23.7% it was $\geq 100\%$ of the WHO reference value. There were 91.3% male subjects in whom BMI for age was less than the respective reference value, whereas in case of female children the corresponding value was 72.6%. There existed no significant ($P > 0.05$) association between gender and nutritional status of study subjects (Table 2).

Iodine deficiency

Regarding the presence of Goiter, it was found to be 34.8% among the male children whereas, the Goiter rate was 22.2% in female children. However, the overall prevalence of goiter was found to be 24.6%. Grade I and Grade II goiter was present in 30.4% and 4.3% male subjects; corresponding value for female subjects were 21% and 1.1%. In all 22.9% and 1.7% children had Grade I and Grade II goiter respectively. There existed no significant ($P > 0.05$) association between gender and Iodine deficiency (Table 3).

Table 2: Under nutrition- in study subjects (N=118).

BMI (As per WHO reference)	Male		Female		Total	
	No.	%	No.	%	No	%
<100	21	91.3	69	72.6	90	76.3
≥ 100	2	8.7	26	27.4	28	23.7
Total	23	100	95	100	118	100

$\chi^2=3.57$, $df=1$, $p>0.05$.

Table 3: Presence of goiter- in study subjects (N=118).

Gender	Goiter grade						Total	
	Grade-0		Grade-I		Grade-II			
	No	%	No	%	No	%	No	%
Male	15	65.2	7	30.4	1	4.3	23	100.0
Female	74	77.9	20	21.1	1	1.1	95	100.0
Total	89	75.4	27	22.9	2	1.7	118	100.0

$\chi^2=2.29$, $df=2$, $p>0.05$.

Nutritional status and Iodine deficiency

It was observed that in subjects with BMI for age less than 100%, goiter was found to be associated with 25.6% subjects but in the children having BMI for age $\geq 100\%$, the goiter was associated only with 21.4%. Significant ($P < 0.05$) association was observed between nutritional status and iodine deficiency (Table 4).

Table 4: Nutritional status and Goiter (N=118).

Goiter grade	BMI (As per WHO reference)			
	<100		≥ 100	
	No	%	No	%
Grade-0	67	74.4	22	78.6
Grade-I	23	25.6	4	14.3
Grade-II	0	0.0	2	7.1
Total	90	100	28	100

$\chi^2=7.66$, $df=2$, $p < 0.05$.

Iodine content of the salt

Iodized salt consumption was found in all the 16 houses. Iodine content of the salt samples from the new packets, present as stocks in the houses were found to be of 15ppm but this was not the situation in case of salt samples were taken from loose packets. In case of 37.5% salt samples from 6 houses, iodine level was 7ppm and rest 62.5% samples iodine content was found to be 15ppm (Figure 1).

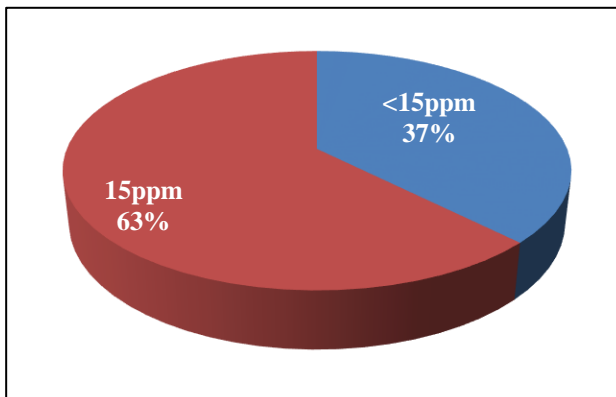


Figure 1: Iodine content of the salts (n=16).

DISCUSSION

This study reports very high prevalence of under nutrition (3 out of 4 children) and IDD (1 out of 4 children).

A study conducted at international level in Ethiopia among the school children of 6-12 years, reported higher overall prevalence of goiter (viz. 3 out of 10 children) (Abebe et al).¹⁷ Contrary to this, lower figures of IDD was reported in a study conducted in Saudi Arabia, (Al Dakheel, et al).¹⁸

Abuye et al, in Ethiopia, reported 23% higher prevalence of Goiter among children of low income family than the family having higher income.¹⁹ The higher goiter rate in low income category could be because of poor food security, including less meat and vegetable consumption, use of non-iodized salt, lack of medical attention. This suggests that living standard has direct relationship with iodine nutritional status and thereby with prevalence of IDD in a population, which simulate in this current study.

In Indian context, Kapil et al, and Sen et al, reported prevalence lower than the current study which are 15.9% and 20% respectively.^{20,21}

A study in Karnataka found 16.75% prevalence of Goiter in school age children in the age group 5-13 yrs.²² In Aligarh a study conducted by Aslami et al, observed miniscule prevalence about 5.2% as compared to this study.²³ According to a study conducted in Nainital by Sareen et al, in three districts, namely Udham Singh Nagar (USN), Nainital (N), and Pauri Garhwal (PG) the total goiter rate was found to be 13.2% (USN), 15.9% (N) and 16.8% (PG), respectively depicting prevalence lower than this study.²⁴

It was reported by Kapil et al, that 42.3 percent and 57.7 percent of the salt samples had iodine content of $< 15\text{ppm}$ and $\geq 15\text{ppm}$, respectively.²⁰ But in the current study 37.5% salt sample were less than 15ppm and 62.5% sample were found to be within 15ppm.

However, the salt samples from the new packets from all houses, which were in stock were found to be of 15ppm, indicating that, there is a problem in storing the opened salt packet and subsequent use. On inspection in all the 6 houses where the iodine content was found to be less than 15ppm, it was found that the mothers were keeping the salt for use in containers which were not air tight leading to increase in the moisture content of the salt and subsequently decrease in Iodine content of the salt.

CONCLUSION

Nutritional status of the children under reference was far from being satisfactory. High prevalence (Moderate) of Goiter is a matter of serious concern. Significant association was observed between nutritional status and IDD.

ACKNOWLEDGEMENTS

Authors would like to acknowledge the assistance of staffs of SOS children’s village, Varanasi. Authors are thankful to Mr. Manoj Mishra, Director, of the village. They would like to extend their gratitude to the Medical Officer In-charge, Dr. Sunil Gupta and Pharmacist of CHC Chiraigaon for providing them with the spot Iodine testing kit (I-check).

Special thanks to all the children of SOS children's village for their assent and co-operation in health examination. All the mothers of the village extended their support by providing them with salt sample for analysis.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Study was survey based, consent from Director of the SOS children's village and assent from the individual children was taken

REFERENCES

1. New Delhi: Micronutrient Initiative. Micronutrient Initiative. Investing in the future - a united call to action on vitamin and mineral deficiencies. Global report, 2009. Available at http://www.unitedcalltoaction.org/documents/Investing_in_the_future.pdf. Assessed on 15 Mach 2017.
2. United Nations Children's Fund. Sustainable Elimination of Iodine Deficiency, Progress since the 1990 World Summit for Children; May 2008. Available at http://www.unicef.org/iran/Sustainable_Elimination_of_iodine_Deficiency_053008%281%29.pdf. Assessed on 15 Mach 2017.
3. Hetzel BS, Delange F, Dunn JT, Ling J, Mannar Venkatesh, Pandav CS. International Council for the Control of Iodine Deficiency Disorders. New Delhi: Oxford University Press; 2004. Towards the global elimination of brain damage due to iodine deficiency- a global program for human development with a model applicable to a variety of health, social and environmental problems. Available at http://www.iccidd.org/cm_data/hetzel-a-frontpage.pdf. Assessed on 15 Mach 2017.
4. de Benoist B, McLean E, Andersson M, Rogers L. Iodine deficiency in 2007. Global progress since 2003. Food Nutr Bull. 2008;29:195-202.
5. Pandav CS, Yadav K, Srivastava R, Pandav R, Karmarkar MG. Iodine deficiency disorders (IDD) control in India. Indian J Med Res. 2013;138:418-33.
6. Iodine Network. Global score card, 2010. Available at <http://www.iodinenetwork.net/documents/scorecard-2010.pdf>. Assessed 15 on Mach 2017.
7. Sen TK, Das DK, Biswas AB, Chakrabarty I, Mukhopadhyay S, Roy R. Limited access to iodized salt among the poor and disadvantaged in North 24 Parganas district of West Bengal, India. J Health Popul Nutr. 2010;28:369-74.
8. Kamath R, Bhat V, Rao R, Das A, Ks G, Kamath A. Prevalence of goiter in rural area of Belgaum district, Karnataka. Indian J Community Med. 2009;34:48-51.
9. New Delhi: Ministry of Health and Family Welfare, Government of India; 2011. Department of Health and Family Welfare. Annual Report 2010-2011. Available at <http://www.mohfw.nic.in/showfile.php?lid=767>. Assessed on 15 March 217.
10. Prevalence of Micronutrient Deficiencies. Hyderabad: NNMB Technical Report No.22. ICMR, National Institute of Nutrition; 2003. National Nutrition Monitoring Bureau. Available at <http://www.nnmbindia.org/NNMB%20MND%20REPORT%202004-Web.pdf>. Assessed on 15 March 2017.
11. Government of India. Press note: Withdrawal of restriction on sale of common salt for direct human consumption, Vaisakha 21, 1922, May 11, 2000. Press Information Bureau, Ministry of Health and family Welfare, (Dept. of Health), New Delhi.
12. New Delhi: Directorate General of Health Services Ministry of Health and Family Welfare, Government of India; 2006. National Rural Health Mission IDD and Nutrition Cell. Revised Policy Guidelines on National Iodine Deficiency Disorders Control Programme. Available at http://www.whoindia.org/LinkFiles/Nutrition_Revised_Policy_Guidelines_On_NIDDCP.pdf. Assessed on 15 March 2017.
13. Joint WHO/UNICEF/ICCIDD Consultation. Indicators of assessing iodine deficiency disorders and their control through salt iodization. Geneva: World Health Organization; November 1992. (WHO/NUT/94.6).
14. United Nations Children's Fund. United Nations Plaza, New York: UNICEF, The State of the World's Children. 2011. Adolescence; an Age of Opportunity. Available at http://www.unicef.org/sowc2011/pdfs/SOWC-2011-Main-Report_EN_02092011.pdf. Assessed on 15 March 2017.
15. UNICEF. Coverage Evaluation Survey 2009, All India Report. Ministry of Health and Family Welfare, Government of India, New Delhi. Available at <http://www.unicef.org/india/health.html>. Assessed on 15 March 2017.
16. SOS Children's Village. Available at <https://www.soschildrensvillages.in/>. Assessed 15 March 2017.
17. Abebe Z, Gebeye E, Tariku A. Poor dietary diversity, wealth status and use of un-iodized salt are associated with goiter among school children: a cross-sectional study in Ethiopia. BMC Public Health. 2017;17(1):44.
18. Al-Dakheel MH, Haridi HK, Al-Bashir BM, Al-Shingiti A, Al-Shehri S, Gassem MA, et al. Prevalence of iodine deficiency disorders among school children in Saudi Arabia: results of a national iodine nutrition study. Eastern Mediterranean Health Journal. 2016;22(5):301.
19. Abuye C, Berhane Y, Akalu G, Getahun Z, Ersumo T. Prevalence of goiter in children 6 to 12 years of age in Ethiopia. Food and Nutrition Bulletin. 2007;28(4):391.
20. Kapil U, Pandey RM, Prakash S, Kabra M, Sareen N, Bhadoria AS, et al. Assessment of iodine deficiency in school age children in Nainital

- District, Uttarakhand State, *Asia Pac J Clin Nutr.* 2014;23(2):278-81.
21. Sen TK, Biswas AB, Chakrabarty I, Das DK, Ramakrishnan R, Manickam P, et al. Persistence of iodine deficiency in a Gangetic floodprone area, West Bengal, India, *Asia Pac J Clin Nutr.* 2006;15(4):528-32.
 22. Kumari R. Goiter Prevalence in Children in North India Region. *Asian Journal of Biomedical and Pharmaceutical Sciences.* 2016;6(53):39-40.
 23. Aslami AN, Ansari MA, Khalique N, Kapil U. Iodine Deficiency in School Children in Aligarh District, India. *Indian Pediatr.* 2016;53(8):742-3. (Pubmed).
 24. Sareen N, Kapil U, Nambiar V, Pandey RM, Khenduja P. J *Indian J Endocrinol Metab.* 2016;20(2):171-6.

Cite this article as: Majhi MM, Mishra CP, Shankar P, Khanam Z. Nutritional status vis-a-vis iodine deficiency in children of "Save Our Soul" children's village in rural Varanasi: a micro-level study. *Int J Res Med Sci* 2017;5:3178-84.