



The behavior of the Household Mother Availability and Consumption of Iodium Salt and its Impact on IDD



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Manuscript submitted: 27 July 2020, Manuscript revised: 09 August 2020, Accepted for publication: 18 September 2020

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Keywords

*attitudes;
behaviors;
goiter;
IDD;
knowledge;*

Abstract

The purpose of this study was to determine the behavior of housewives, the level of availability, and the level of consumption of iodized salt with the incidence of IDD. This type of research is observational with a cross-sectional design. The sample is all mothers who have children in grades 3, 4, and 5 in the Buana Giri 7 public elementary school, totaling 80 people. Data were collected by interview, observation, and weighing methods. The quality of iodized salt was tested using the iodine test. Goiter grade was obtained by the palpation method. The data that has been collected were analyzed with Pearson correlation. The level of knowledge, attitude, and practice of iodized salt are still low so it needs to be improved. The level of availability of iodized salt on average still low (3.8 g/person/day) and the level of consumption of iodized salt (2.1 g/person/day). Goiter grade entire sample was normal. Behavior-related knowledge ($r = 0.8$) and practice ($r = 0.8$) of iodized salt, but the behavior is not related to the availability ($r = 0.024$) and iodized salt consumption ($r = -0.09$). Contributions behavior is very weak against the availability and consumption of iodized salt.

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Contents

Abstract	1
1 Introduction	2
2 Materials and Methods	2
3 Results and Discussions	2
3.1 Results	2
3.2 Discussion	5
4 Conclusion	6
Acknowledgments	7
References	8
Biography of Authors	9

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1 Introduction

The problem of Iodine deficiency disorders (IDD) is still a major nutritional problem in Indonesia. The occurrence of IDD can be caused by a lack of consuming foods that contain iodine and is supported by environmental factors such as soil, water, and plants in the area which are very poor in iodine. IDD is one of the inhibiting factors for human resource development because it can interfere with mental development and intelligence, especially in children (Coelho *et al.*, 2018). The occurrence of IDD can be prevented by meeting the iodine requirement of 80-150 ug/day. This need can be fulfilled by consuming 6-10 grams of iodized salt/day, where the iodine content ranges from 30-80 ppm KIO₃ (Dhyana Putri, 2008; Djokomoeljanto, 1987).

The consumption of iodized salt in Bali Province needs to be increased because based on Basic Health Research (2013) it has only reached 50.8%. The need for iodine will not be fulfilled if people's behavior about iodized salt does not change in a positive direction, namely providing and consuming iodized salt as needed (Indonesia Ministry of Health, 2013).

The results of the IDD prevalence survey conducted in Karangasem district, Bali province in 2005 revealed that the Total Goiter Rate (TGR) was 21.8% (moderate endemic areas). One of the districts that are categorized as a severe endemic is Bebandem District (TGR = 31.9%). This is probably due to the low consumption of iodized salt. The Buana Giri 7 Elementary School is located in Buana Gizi Village, Bebandem District, which is a goiter endemic area (Karangsem Health Office, 2005; Agusjaya & Kusumajaya, 2014).

This research will reveal the behavior of housewives, the level of availability, and the level of consumption of iodized salt with the incidence of IDD. The results of this study can be used as a basis for planning a more effective IDD prevention in Bali Province based on areas.

2 Materials and Methods

This research was conducted at Buana Giri Elementary School, Bebandem District, Karangasem Regency, Bali Province. This type of research is observational with a cross-sectional design (Sastroasmoro & Ismael, 1995). The research sample is all mothers who have children in grades 3, 4, and 5 at elementary school 7 Buana Giri, totaling 80 people.

Data on knowledge, attitudes, and practices of mothers about iodized salt were obtained by interview method using a list of questions. The availability and consumption of iodized salt were obtained by interview, observation, and weighing methods. The quality of iodized salt was tested using the iodine test and IDD grade was obtained by palpation method (Indonesia Ministry of Health, 1998).

The data that has been collected is presented in a frequency table and narrated according to the objectives. To determine the relationship between behaviors, availability, consumption of iodized salt, and IDD grade, the Pearson correlation test was used (Djarwanto, 2001; Swahn *et al.*, 2004; Ruano *et al.*, 2019).

3 Results and Discussions

3.1 Results

Parents education and work

Most of the parents' education level is elementary school, namely mothers (71.2%) and fathers (65.0%). Junior high school education level for mothers (10.0%) and fathers (22.5%) (Table 1).

Table 1
Distribution of parents by education level

Level of education	Mother		Father	
	f	%	f	%
Primary school	57	71.2	52	65.0

Junior high school	8	10.0	18	22.5
Senior High School	5	3.8	6	7.5
College	1	1.2	0	0
No school	11	13.8	4	5.0
Total	80	100.0	80	100.0

Most of the jobs they have as farmers are a mother (45.0%) and father (76.3%). Other jobs include the private sector, labor, civil servants, traders, and some mothers who do not even work (Table 2).

Table 2
Distribution of parents by occupation

Work	Mother		Father	
	f	%	f	%
Farmer	36	45.0	61	76.3
Private	6	7.5	8	10.0
Labor	4	5.0	9	11.2
Government employees	1	1.2	0	0
Merchant	12	15.0	2	2.5
Not work	21	26.2	0	0
Total	80	100.0	80	100.0

The place to buy iodized salt

The sample places to buy iodized salt are in shops and markets in the village (Table 3).

Table 3
Distribution of samples according to where to buy iodized salt

The Place	Frequency	
	f	%
Shop	47	58.8
Market	27	33.8
Not Buy	6	7.6
Total	80	100.0

Knowledge, attitudes, practices, and behaviors about iodized salt

On average, knowledge, attitudes, and practices regarding iodized salt still need to be improved. Behavioral value is the average value of knowledge, attitudes, and practice (Table 4).

Table 4
Parameters of knowledge value, attitudes, practices, and behaviors about iodized salt

Parameter	Knowledge	Attitude	Practice	Behavior
The lowest score	0	48	0	26
The highest score	90	90	100	87
Average	52.0	72.3	59.4	61.2
Standard deviation	24.5	8.6	29.8	16.1

If categorized as good, enough, and less, most of the knowledge is still lacking (48.8%), attitudes are sufficient (66.2%), practice is still lacking (35.0%) and behavior is partly sufficient (51.2%) (Table 5).

Table 5
Distribution of samples according to knowledge, attitude, practice, and behavior of iodized salt

Value Category	Knowledge		Attitude		Practice		Behavior	
	f	%	f	%	f	%	f	%
Good	14	17.4	20	25.0	22	27.5	8	10.0
Enough	27	33.8	53	66.2	30	37.5	41	51.2
Less	39	48.8	7	8.8	28	35.0	31	38.8
Total	80	100.0	80	100.0	80	100.0	80	100.0

Level of availability and consumption of iodized salt

On average, the level of availability and consumption of iodized salt is still low, it does not meet the recommended adequacy of 6 grams per person per day (Table 6).

Table 6
Parameters of availability and consumption level of iodized salt

Parameter	Availability of Iodized Salt (g/person/day)	Consumption of Iodized Salt (g/person/day)
The lowest score	0	0
The highest score	16.7	10.0
Average	3.8	2.1
Standard deviation	2.8	1.9

The level of availability of iodized salt in households with a good category has only reached 10.0% and the level of consumption that has met the recommendation is 5.0% (Table 7). The availability of iodized salt at the village level is still limited, that is, some stalls have already sold iodized salt, but people rarely buy iodized salt. This is probably because people do not know well the function of iodized salt for health and preventing IDD.

Table 7
Distribution of samples according to availability and consumption level of iodized salt

Category	Availability of Iodized Salt		Consumption of Iodized Salt	
	f	%	F	%
Good (≥ 6 g)	8	10.0	4	5.0
Less (< 6 g)	72	90.0	76	95.0
Total	80	100.0	80	100.0

Grade IDD

To determine the prevalence of IDD, palpation was carried out on primary school children who were sampled. Palpation results showed that all samples had grade IA so that all samples were declared normal.

Relationship between behavior and availability and consumption of iodized salt

Most of the samples with sufficient behavior but lack of availability (48.7%). Even though they have good behavior, they have not been able to provide iodized salt as recommended. (table 8)

Table 8
Distribution of samples according to behavior and availability of iodized salt

Behavior	Availability Level of Iodized Salt				Total	
	Good		Less		n	%
	n	%	n	%		
Good	0	0.0	8	10.0	8	10.0
Enough	2	2.5	39	48.7	41	51.2
Less	6	7.5	25	31.3	31	38.8
Total	8	10.0	72	90.0	80	100.0

Most of the samples with sufficient behavior but had a low consumption level (50.0%). Even though they already have good behavior, they are not able to consume iodized salt as recommended (Table 9).

Table 9
Distribution of samples according to behavior and level of consumption of iodized salt

Behavior	Level of Consumption of Iodized Salt				Total	
	Good		Less		n	%
	n	%	n	%		
Good	0	0.0	8	10.0	8	10.0
Enough	1	1.2	40	50.0	41	51.2
Less	3	3.8	28	35.0	31	38.8
Total	4	5.0	76	95.0	80	100.0

Relationship of behavior, availability, and consumption level with grade of IDD

Based on the Pearson correlation test at a significant level of 5%, it was found that behavior was significantly related to knowledge ($r = 0.8$) and practice ($r = 0.8$) but had no significant relationship with attitudes about iodized salt ($r = 0.1$).

Behavior has no significant relationship with availability ($r = -0.02$) and consumption of iodized salt ($r = -0.09$). The level of availability has a significant relationship with the level of consumption of iodized salt ($r = 0.3$). After palpation, all samples had IDD IA grade, so that their relationship with the availability and consumption of iodized salt could not be analyzed.

3.2 Discussion

The level of education of parents, both mothers and fathers, is still low (elementary school), namely mothers (71.2%) and fathers (65.0%). The level of education can be associated with the acceptance of innovation. The family habit of consuming local non-iodized salt will require routine and continuous socialization efforts so that there is a change in the behavior of consuming iodized salt. Research by Nurrahmah (2010), states that there is no relationship between education and consumption of iodized salt.

Most of the jobs that are owned by parents are as farmers, namely mother (45.0%) and father (76.3%). This situation can restrict parents from accessing information so that behavior changes in consuming iodized salt are slow or not optimal. In addition to jobs that can help parents access information, including mass media such as television, radio or newspapers, social media, and social activities such as PKK social gathering in the Banjar, counseling activities at posyandu, and so on.

On average, knowledge, attitudes, and practices regarding iodized salt still need to be improved (Wärneryd, 1996). Parents' knowledge about iodized salt will determine the attitude to be adopted, which in turn has an impact on the behavior to be carried out. Housewives as individuals tend to use iodized salt because they already know its benefits (predisposing factors). Even though he has a predisposition to use iodized salt, he will not act to use it, unless he can obtain iodized salt according to his ability (enabling

factors). Then the mother will use iodized salt if it is a need (need factor). Designing counseling to increase the use of iodized salt really needs to pay attention to this so that the content of extension is more directed to make mothers feel that using iodized salt in the household is a necessity (Soekidjo, 2010).

The level of availability of iodized salt in households with a good category has only reached 10.0% and the level of consumption that has met the recommendation is 5.0%. The level of availability has a significant relationship with the level of consumption of iodized salt ($r = 0.3$). The availability of iodized salt in the household is influenced by the knowledge, attitudes, and practices of parents, it can also be influenced by the availability at the village level (Drew, 1997). Iodized salt is available in the village or district market in limited quantities, so this is also an obstacle to getting iodized salt. Besides that, the distance from the house to the village market is quite far and the stalls around the village are only available in non-iodized local salt.

The iodized salt distribution system in Bali Province through village unit cooperatives (KUD) at the regency or sub-district level. Also, some traders use cars directly selling iodized salt to traders up to the village level. However, not all villages can be visited regularly due to long distances and demographic conditions. Monitoring of iodized salt at the village level is carried out by puskesmas officers through elementary schools in their working areas according to existing guidelines. Primary schools that are monitored for the use of iodized salt will be used to generalize the use of iodized salt in the general public.

Research by Nurrahmah (2010), states that there is a relationship between availability and consumption of iodized salt. Elfrida (1998), reveals that low levels of income and communication activities, especially interpersonal and mass media, lead to low consumption of iodized salt and there is no relationship between education level and attitude and weight of salt consumed. Herna Agustini (1999), research also reveals the level of education and knowledge about IDD is not related to the use of iodized salt.

However, research by Titien Purwiyanti (1997), revealed that the dominant factor in household consumption of iodized salt in endemic areas of goiter is the level of knowledge of iodized salt. The research of Nurrahmah (2010) states that it is contrary to the research of Titien (1997), namely that there is no relationship between knowledge and consumption of iodized salt.

Research by Sukarno *et al.* (2016), stated that iodine consumption was positively related to the results of iodine excretion in urine. The higher the iodine consumption, the higher the iodine excretion results in the urine. The excretion of iodine in urine is one of the indicators used to assess the daily consumption of iodine both from food sources of iodine and salt. This is because most of the iodine that is absorbed by the body will be excreted in the urine.

Behavior has no significant relationship with availability ($r = -0.02$) and consumption of iodized salt ($r = -0.09$). The results of the 2007 and 2013 Riskesdas show that the higher the level of education the higher the proportion of consuming iodized salt. In this study, most of the parents' education level is an elementary school. This situation also supports the low availability and consumption of iodized salt at the household level (Indonesia Ministry of Health, 2013; Indonesia Ministry of Health, 2007).

Although no samples have been found suffering from IDD, the availability and consumption of iodized salt are still low. If this situation persists for a relatively long time and the consumption pattern of foods with low iodine content, IDD events may occur in elementary school children. This situation should not make health workers complacent and allow people to continue to consume less iodized salt.

Another impact that can be caused is the disruption in the mental and intellectual development of the child. Sutomo (2007), reveals that there is a significant difference between the achievement of primary school children with IDD compared to those without IDD, where the status of IDD reduces the learning achievement of elementary school children. Research Budiman & Iman (2007), showed that iodine consumption was associated with the prevalence of goiter in female students aged 15-17 years (Cengiz *et al.*, 1990).

4 Conclusion

1) The level of knowledge, attitude, and practice regarding iodized salt is still low so it needs to be improved, 2) The level of availability of iodized salt on average is still low (3.8 g/person/day) and the level of consumption of iodized salt (2.1 g/person/day), 3) Grade of IDD for all samples is still normal. 4) Behavior is related to knowledge ($r = 0.8$) and practice ($r = 0.8$) about iodized salt, but behavior is not related to

availability ($r = -.024$) and consumption of iodized salt ($r = -0.09$). This situation shows a very low behavioral contribution to the supply and consumption of iodized salt at the household level.

Even though there has not been any sample suffering from IDD, the suggestion that can be conveyed is that it is still necessary to socialize iodized salt to improve the behavior of housewives to use iodized salt. The low consumption of iodized salt not only affects the incidence of IDD but can also affect the mental and intellectual development of children.

Acknowledgments

On this occasion, thanks are conveyed to the headmaster of elementary school 7 Buana Giri for the permission given, to elementary school children and their mothers as samples for their willingness to spend time when collecting data. To the Director and Head of the Department of Nutrition, Poltekkes Kemenkes Denpasar for the support that has been given.

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