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Knowledge and Perceptions of Housewives on the Use of Iodized Salt: A Cross-Sectional Study in Tampaksiring

Pengetahuan dan Persepsi Ibu Rumah Tangga dengan Penggunaan Garam Beryodium: Studi Cross-sectional di Tampaksiring

Kadek Nuansa Putri Wulandari[1], Ni Ketut Sutiari[2]*

[1]Program Studi Magister Ilmu Kesehatan Masyarakat, Fakultas Kedokteran, Universitas Udayana, Denpasar, Bali, Indonesia
[2]Departemen Kesehatan Masyarakat-Kedokteran Pencegahan, Fakultas Kedokteran Universitas Udayana, Denpasar, Bali, Indonesia

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Correspondent:
Ni Ketut Sutiari
ketut_sutiari@unud.ac.id

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ABSTRACT

Background: Iodine is an essential nutrient for the human body—lack of iodine in the body results in iodine deficiency disorders, which can cause various health problems. In Bali, Indonesia, 58% of the people use less iodized salt. The working area of Tampaksiring I Public Health Center alone has low iodized salt coverage of 44.9% of the target of 85% in 2019.
Objectives: This study aimed to determine the correlation of knowledge and perceptions of housewives with the use of iodized salt at the Tampaksiring I Public Health Center.
Methods: This cross-sectional study was conducted in April 2021, with 111 subjects obtained from calculations using accidental sampling. Meanwhile, the Chi-Square test was used in the analysis.
Results: Of all research subjects, 59.5% of housewives are in the 'good' category for the knowledge of iodized salt; 51.4% have a good perception of iodized salt, and 70.3% have used iodized salt. Based on the analysis, no association is found between knowledge and use of iodized salt. However, this study reveals a relationship between perception and the use of iodized salt.
Conclusions: Most housewives already have good knowledge and perception about iodized salt. Knowledge does not correlate with the use of iodized salt, while perception is related to the use of iodized salt. This is due to various factors such as habits, environmental factors, and the availability of iodized salt in the community.

INTRODUCTION

Iodine is a raw element that is vital for the human body. Since it is highly needed for the synthesis of thyroid hormones by the thyroid gland, iodine deficiency can lead to various iodine deficiency diseases (IDD), such as goiter, intellectual disorders, growth disorders, neonatal hypothyroidism, cretinism, and an increased risk of fetal and infant death[1,2]. In addition, severe iodine deficiency can be associated with growth retardation in all organ systems from the fetus to adulthood[3]. One-third of the population lives in areas with insufficient access to natural sources of iodine, making iodine deficiency one of the most common micronutrient deficiencies[4]. Furthermore, two hundred and forty-one million school children are estimated to have insufficient iodine intake, mostly living in Southeast Asia and Africa[5].

Iodine deficiency is one of the causes of inhibition of thyroid hormone production, which can affect growth and development. Iodine deficiency in early pregnancy also affects the development of the fetal brain[6]. Fortunately, this can be prevented with the Universal Salt Iodization (USI)[7], a strategic program to add iodine to the salt circulating in the community which was proposed in 2007 by the World Health Organization (WHO), the International Council for the Control of Iodine Deficiency Disorders (ICCIDD), and the United Nations Children's Fund (UNICEF)[7]. This program effectively maintains the recommended iodine status for households, around 20-40 ppm, depending on the use and availability of iodine from other food sources[8].

Of all regions in Indonesia, according to data from the Gianyar Regency Health Office in 2017, Bali occupies the second lowest position in consumption of iodized salt, with a percentage of 58%[9]. In 2020, the use of iodized salt in Bali only reached 80.6%, still not meeting the set target of 82%[10]. One of the regencies in Bali that has not yet reached the regency target of 78% is Gianyar Regency. Although the use of iodized salt in Gianyar Regency increased from 74% in 2018 to 78% in 2019, this percentage has decreased to 71% in 2020[11]. Among all

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areas in this regency, Tampaksiring I Public Health Center has a low coverage of iodized salt use, i.e., 62.8% in 2017 and 44.9% in 2019, which is still far below the target of 85%[11].

The knowledge and perceptions of housewives are considered to have a significant effect on the use of iodized salt in the household. Housewives who do not have good knowledge and perceptions of the use of iodized salt tend to use non-iodized salt or use iodized salt incorrectly. Aside from that, care must be taken when choosing iodized salt to ensure it is used and stored appropriately. According to Nabarun Karmakar (2019), most housewives already use iodized salt but are unaware of the proper ways to use and store it[12]. Another study claims that more than half of the observed housewives do not correctly use iodized salt due to a lack of information[13]. Assessment of people's knowledge, attitudes, and practices regarding the consumption of iodized salt is crucial to determine why people do not use iodized salt. However, the number of existing studies on this topic is still very limited throughout the world[8]. This study aimed to determine the correlation of knowledge and perceptions of housewives with the use of iodized salt at the Tampaksiring I Public Health Center.

METHODS

This cross-sectional study was conducted in April 2021 in the working area of Tampaksiring I Public Health Center, which has a low coverage of iodized salt use, with a population of housewives living there. A sample size of 111 respondents was obtained using the Accidental Sampling method, with the inclusion criteria being housewives between the ages of 20 and 50 who were willing to participate in the study and the exclusion criteria being not available at home during the period of this study or being ill. Data on characteristics, knowledge, and perceptions of housewives and the availability of iodized salt in the community were collected through questionnaires and interviews. Due to limitations in getting to the field during the COVID-19 pandemic, data collection through interviews and observations was assisted by local Posyandu (*Pos Pelayanan Terpadu*/Integrated Healthcare Center) cadres. Before conducting interviews with respondents, the cadres had been given information or socialization regarding the procedures for filling out the questionnaire. This study used a questionnaire from Martha Veronica (2014) and Novi Yanti (2015), which has been modified and tested for reliability and validity[14,15]. Meanwhile, data on the use of iodized salt was acquired through observation and checking for iodine contained in household salt using an iodine test.

Knowledge is measured by ten questions in the questionnaire regarding iodized salt. This variable is considered 'good' if the respondent correctly answers more than or equal to 7 questions and 'poor' if the respondent correctly answers less than seven questions. Meanwhile, the perception of housewives was measured using a Likert scale consisting of 10 questions regarding perception. This variable is classified as 'poor' if the score obtained is less than the median and 'good' if the total score is more than or equal to the median. The iodine test was carried out by researchers in the shortest possible time since the salt was taken from the household to prevent damage to the salt due to the external environment. The salt is iodized if the color turns purple in the iodine test.

Obtained data were then analyzed using univariate analysis to determine the characteristics of the respondents and bivariate analysis using the chi-square test to determine the relationship between variables. This study has received approval from the Research Ethics Commission of the Faculty of Medicine and Sanglah General Hospital, Denpasar, with Ethics No. 1509/UN14.2.2.VII.14/LT/2021.

RESULTS AND DISCUSSION

Table 1 displays the characteristics of housewives as respondents of this study, consisting of several categories, namely age, education, and occupation. All respondents are from 3 villages and eight hamlets in the working area of Tampaksiring I Public Health Center, namely Manukaya Village, Tampaksiring Village, and Sanding Village. Most respondents are 30-49 years old (79.3%), junior high school graduates, and housewives.

Table 1. Characteristics of Respondents (n=111)

Characteristics	Frequency	%
Age (year)		
19-29	13	11.7
30-49	88	79.3
50-64	10	9
Education		
Not Finish School	26	23.4
Elementary School	25	22.5
Junior High School	28	25.2
Senior High School	23	20.7
University/ Diploma	9	8.1
Occupation		
Unemployed	1	0.9
Farmer	6	5.4
Civil Servant/Indonesian Police/Indonesian National Armed Forces	3	2.7
Private Employees	5	4.5
Seller/Entrepreneur	10	9
Housewife	84	75.7

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Characteristics	Frequency	%
Others	2	1.8

Availability and Use of Iodized Salt

The availability of iodized salt can be observed from the content of iodized salt in the household, which was checked using an iodine test. Access to iodized salt, salt storage, and salt usage were also observed, as seen in Table 2. In addition, this study identified whether the respondents have ever received socialization and checking on iodized salt by health workers.

Table 2. Availability and Use of Iodized Salt

Variable	Frequency	%
Iodine Content in Salt		
Colorless	33	29.7
Purple in color	78	70.3
Access to Iodized Salt		
Less than 5-minute walk	95	85.6
5 minutes using transportation	16	14.4
Salt Storage Location		
Away from heat sources	89	80.2
Close to heat source (stove or traditional stove)	22	19.8
Salt Usage		
While the food is being cooked	92	82.9
When food is served	19	17.1
Salt Storage		
Closed containers	92	82.9
Open or plastic containers	19	17.1
Socialization of Iodized Salt		
Ever	31	27.9
Never	80	72.1
Checking of Iodized Salt by Health Workers		
Yes	69	62.2
No	42	37.8

From the iodine test results, most housewives in Tampaksiring are known to have used iodized salt in their daily cooking activities. In the interview, those who did not use iodized salt stated that they had already been in the habit of using Balinese salt, which is commonly sold in the market. In addition, they do not understand the difference between Balinese salt, which is non-iodized, and iodized salt, resulting in the purchase of salt they are familiar with. On top of that, the cadres of the Posyandu assume that housewives do not use iodized salt as usually the older member of the family (mother or mother-in-law) is the one who shops for their daily needs (groceries). This causes housewives to have no information about the difference between iodized and non-iodized salt; they know they have salt at home, which can add saltiness to their dishes.

Table 3. Knowledge and Perceptions of Respondents on the Use of Iodized Salt

Variable	Frequency (n=111)	%
Knowledge		
Poor	45	40.5
Good	66	59.5
Perception		
Poor	54	48.6
Good	57	51.4

More than half of the total respondents (59.5%) already have good knowledge about iodized salt. Of the questions asked, three were answered incorrectly by most respondents. The first question is, “Does good iodized salt give off color when dripped with iodine test solution?” Only 28.8% of the total respondents answered this question correctly. This shows that most respondents still have no idea that iodized salt will turn dark purple in the iodine test, thus being unable to identify iodine in salt. The second question, “When do you add iodized salt into the food?” was also answered incorrectly by 76.6% of respondents, meaning that only 23.4% of them understand that using salt incorrectly can reduce the iodine content in the salt. Most housewives do not know that salt must be added to the food when serving it. Due to the lack of knowledge about iodized salt, the use of iodized salt in households is not optimal. These results align with a study by Hairil Akbar (2021) that found that mothers in Muntoi Village still use iodized salt when cooking[16]. According to the WHO, the way food is processed affects the iodine content of salt, which will be lost partially in the process with all cooking techniques: about 20% in frying, 23% in roasting, and 58% in boiling. Furthermore, based on the results of this study, most

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housewives (51.4%) are known to have a good perception of iodized salt, including its benefits, how to choose it, where to store it, and how to store it.

Table 4. Relationship between Knowledge and Perception of Respondents on the Use of Iodized Salt

Variable	Non-Iodized Salt (Colorless)		Iodized Salt (Purple)		OR (95% CI)	p-value
	n	%	n	%		
Knowledge						
Poor	18	40.0	27	60.0	0.441 (0.193 – 1.011)	0.059
Good	15	22.7	51	77.3		
Perception						
Poor	22	40.7	32	59.3	0.348 (0.148 – 0.816)	0.022
Good	11	19.3	46	80.7		

Relationship between Knowledge and the Use of Iodized Salt

The statistical test results showed a p-value of 0.059 (>0.05), indicating no relationship between knowledge and the use of iodized salt. As seen in Table 4, more housewives, both those with 'poor' knowledge and those with 'good' knowledge, have used iodized salt. This is due to various factors, such as the habit of using salt daily, environmental conditions, and the availability of salt in the market[17]. From the interviews, it is known that respondents tend not to choose a particular brand of salt; they buy whatever salt is available in the market that can add saltiness to their food. This is closely related to environmental conditions and the availability of iodized salt. The three villages in the working area of Tampaksiring I Public Health Center are pretty far from the center of Gianyar Regency (18.7 km). They are located at an altitude of around 175-775 m above sea level[18]. However, with modern transportation and adequate road structures for the trips taken to reach these three villages, iodized salt is relatively easy to obtain for people living in this area. There are two options for access to the iodized salt variable based on distance: 'close' if it can be reached on foot in less than 5 minutes and 'far' if it can be reached using transportation for around 5 minutes. From the results, 85.6% of respondents needed to walk for 5 minutes to get salt, and 82% bought salt at a shop.

The working area of Tampaksiring I Public Health Center is around 27.08 km^2 from Sanding Village to Manukaya Village. People living in this area, far from the city center or public market, usually shop for their daily needs only at nearby stalls close to their homes. This also explains the large number of people who have already used iodized salt since most stalls usually sell factory-made iodized salt with practical and efficient packaging rather than traditional salt that is sold per kilo and does not have practical packaging.

This finding aligns with Yunita Damanik (2019), who revealed no correlation between the knowledge of housewives and the use of iodized salt, as people with good knowledge do not necessarily exhibit good behavior in using iodized salt[19]. In addition, a previous study by Sutiah (2017) also found no relationship between knowledge and the use of iodized salt at home[20]. However, the finding of this study contradicts a study conducted by Hairil Akbar (2021), which discovered a relationship between knowledge and the use of iodized salt in households in Muntoi Village (p-value 0.034), where knowledge of 59.0% of mothers in the village regarding iodized salt, its benefits, and the impact of iodine deficiency, is still very lacking[16].

Relationship between Perception and the Use of Iodized Salt

There is a relationship between perceptions and the use of iodized salt in the working area of Tampaksiring I Public Health Center, as indicated by the p-value of 0.022 (<0.05). Perception is part of everyone's life, where there is a direct response from a specific process whereby a person understands things using one's five senses or an ability to respond to or sense an object[21]. Based on the results of this study, most housewives have good knowledge of iodized salt, so their perceptions of iodized salt are also quite good, including in understanding the benefits of iodized salt. Good perception is not always followed by good knowledge. Still, it can be influenced by one's social environment, for example, the availability of socialization regarding iodized salt or information in social media, TV, radio, or currently circulating brochures, such as an appeal to use iodized salt in brochures about preventing stunting. Most housewives in this study have good perceptions about how to choose salt, where to store it, and how to store it. Furthermore, housewives with a good perception of iodized salt tend to continue using iodized salt. However, this is heavily influenced by several external factors, such as availability and access to iodized salt.

According to a study conducted by Hesti (2017), three factors have a significant association with the consumption of iodized salt: education, knowledge, and attitudes of housewives[22]. However, iodized salt must be stored and used properly so that the iodine content in the salt is not lost. Bibi Ahmad (2017) explained that most households in North Sibolga District have used iodized salt, but 2.5% have lost its iodine content. This is caused by improper salt storage, namely not using a closed container and placing it close to a heat source (stove)[23]. Based on the above findings, the use of iodized salt in the working area of Tampaksiring I Public Health Center is influenced by habit, environmental factors, and the availability of iodized salt. This is in line with the finding of a study by Made Prawini (2013) that housewives in Lodtunduh Village do not use iodized salt, despite its availability, mostly because they are used to using traditional salt and are influenced by those closest to them, such as their mother-in-law[13].

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CONCLUSIONS

Most housewives already use iodized salt in their daily cooking activities since they have good knowledge and perception of it. However, this study reveals that knowledge is not related to the use of iodized salt, while perception appears to correlate with the use of iodized salt. Various factors, such as habits, environmental factors, and the availability of iodized salt in the community, caused this.

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