

TYPES OF FOOD PROFILE CONSUMED BY LEPROSY PATIENS IN RSUP SANGLAH, DENPASAR, BALI IN 2019

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Abstract: Leprosy is one of the most evocative and an infectious disease known today. Leprosy is caused by *Mycobacterium leprae*, an acid-fast, rod-shaped bacillus which is one of the most old, terrified, and disabling diseases of mankind is on the verge of defeat. It leads to a large range of clinical symptoms, eventually resulting in mutilation and disability if left untreated. Indonesia is one of the largest country with the most number of records of this particular disease. One of the possible risk factor is poverty, although not all poor countries have high leprosy prevalence rates. Through this study we aim to determine the types of food profile consumed by the leprosy patients in RSUP Sanglah, Bali based on age, sex, and their food intake. This study is a quantitative descriptive study in design a questionnaire of their food intake in 24 hour dietary recall which was filled by 25 respondents using a cross-sectional survey. The results of this study shows patients are undernourished due to lack of proper vitamins and energy in their daily food intake. The amount of food intake of leprosy patients are insufficient for them due to poverty and lack of knowledge. Furthermore, it is concluded that more male is prone to this disease compared to women.

Keywords: leprosy patients; calorie count; food intake; RSUP Sanglah.

1. INTRODUCTION

Leprosy is one of the most evocative and an infectious disease known today. The word leper initiated from a Greek word meaning scaly. This disease was initially discovered by G.A. Hansen in 1873. It was known to be the first bacterium that to be identified as causing disease in man. Leprosy is caused by *Mycobacterium leprae*, an acid-fast, rod-shaped bacillus. Leprosy is one of the most old, terrified, and disabling diseases of mankind is on the verge of defeat. Mainly affecting peripheral nerves and the skin. Other than that, it also affect the mucosa of the upper respiratory tract and also the eyes. It leads to a large range of clinical symptoms, eventually resulting in mutilation and disability if left untreated.^{1,2}

In the year 2014, a total of 213,899 new cases were detected with a rate of 3.78 cases per 100,000 population.³ Southeast Asia accounted for the largest which is 72% of the global new case load. Indonesia is one of the largest country with the most number of records of this particular disease. A total aggregate of the quantity of people who, throughout the centuries, have endured its constant course of serious distortion and physical incapacities can never be ascertained. The development period between infection and appearance of leprosy is usually between 2 and 10 years but may be as long as 20 years. Leprosy affects all ages and also both sexes male and female. However, most individuals have considerable natural immunity and many infections are suppressed. Leprosy cases seldom develop in non-endemic areas without known close contacts. The specific risk factors that determine the risk for contacts include the Ridley-Jopling leprosy classification of the index patient, physical distance to the patient and age of the contact. However, in endemic regions the majority of new leprosy patients are not close contacts of a known leprosy case.¹

Another possible risk factor is poverty, although not all poor countries have high leprosy prevalence rates. Among other factors, having experienced food shortage at any time in life was related to leprosy. This is most likely to occur when rice prices are high, household food stocks depleted and income is low due to lack of labor opportunities. This is because, when there is low income in the family or a household, they will have difficulties to get good food with good nutrients, therefore, these people experience food shortage and thus it leads to the cause of leprosy.⁴

Food shortage worsens the often already inadequate intake of micro- and macronutrients. Nutritional deficiencies impair the immune system and thus the defense of the body against infections. The risk of contracting subclinical *M. leprae* infection is not necessarily increased by food shortage, but it could also facilitate the progression from infection to the clinical presentation of leprosy.⁴

2. MATERIALS AND METHODS

This study is a cross-sectional descriptive study to determine the types of food profile consumed by the leprosy patients in RSUP Sanglah, Bali in 2019. The samples were taken from affordable populations based on inclusion criteria and exclusion criteria. The inclusion criteria for this investigation are both male and female participants age from 17 years old to 75 years old patients who are presented with clinical signs of leprosy. The exclusion criteria of this investigation is patients who did not complete diagnostic testing for leprosy. The data collection used a validated questionnaire was adapted from the previous study to assess the nutritional intake of leprosy patients in Denpasar, Bali. All questionnaires will be returned within one hour or if not possible, the questionnaires will be collected at the end of the day's work.

The data collected from questionnaire will be interpreted and tabulated with a computer system. Data will be analysed descriptively. Result will be showed as tables and graphics. This research has received ethical eligibility permission from the Research Ethics Commission (KEP) of the Faculty of Medicine, Udayana University with letter number 1602/UN14.2.2.VII.14/LT/2020.

3. RESULTS

Questionnaires on a 24 hours dietary recall was given to 25 selected leprosy patients at RSUP Sanglah in the months of September to November 2020. This 25 patients were asked to fill in the details in the questionnaires truthfully.

Age Distribution

The mean age of these 25 patients is 37 years old. Age of the patients that attempt the survey was in the range of 17 to 75 years. It was found that in this study most of the patients were of aged from 33-50 years which is 52% of the total number of patients included followed by patients with age group 17-32 years with a percentage of 40%. Lastly is the age group of 51-75 years which is 8% from the total number of patient in this study. Demographic distribution of the patients age is shown in table 1.

Table 1: Age distribution

Age (years)	Number (n)	Percentage (%)
17-32	10	40%
33-50	13	52%
51-75	2	8%
Total	25	100%

In this survey, 25 leprosy patients were included to answer a 24 hour dietary recall questionnaire which were distributed to the patients in RSUP Sanglah from the month of September 2020 until November 2020. In this survey it is recorded that patients age, gender, weight, height, the diagnosis of patient, treatment, what are the patient's diet and 24 hour dietary recall of patient's food. The age range that were included was from the age 17-75 years and the majority patients fell into the age range 33-50 years. Wagenaar et al reported homogeneous age distribution of leprosy patients, with a slight increase among 44 to 60 years age group.⁴

Gender Distribution

In this study showed a male predominance with the percentage of 72% and female with 28%. Among the male patients; 6 patients were in 17-32 years age group, 10 patients were in 33-50 years age group and 2 patients were in 51-75 years age group. While in the female patients; 4 patients were in the 17-32 years age group, 3 patients were in the 33-50 years age group and none was in the 51-75 years age group. Demographic distribution can be seen below in table 2.

Table 2: Gender distribution

Gender	Number of patients (n)	Percentage (%)
Male	18	72%
Female	7	28%
Total	25	100%

In this 25 patients, major number of patients were male with 72% and only 7 female patients were included. It is found that more male is prone to this disease leprosy and it has been shown by many studies previously as well. The reason for a male predominance could be because of lesser reports of cases of women affected with leprosy due to certain factors such as illiteracy, poor mobility and poor knowledge about the disease.⁵

Weight of Patient

Patients with the body weight ranged 45-65 kg is the highest with 18 patients (72%). While there are 5 patients (20%) with the body weight ranged 66-85kg followed by the range 86-105kg and 106-125kg with 1 patient each which is (4%).

Table 3: Patient body weight

Weight (kg)	Number of patients (n)	Percentage (%)
45-65	18	72%
66-85	5	20%
86-105	1	4%
106-125	1	4%
Total	25	100%

Height of Patient

Highest number of patients with the height ranged 156-165cm is 14 patients (56%) followed by 7 patients (28%) with the height range 166-175cm and lastly 4 patients (16%) with height of 145-155 cm.

Table 4: Height of patients

Height (cm)	Number of patients (n)	Percentage (%)
145-155	4	16%
156-165	14	56%
166-175	7	28%
Total	25	100%

BMI of patient

In this study, out of 7 female patients 6 are with normal body weight and 1 is overweight according to the Ministry of Health of Indonesia. Whereas, for the male participants there are a mixture of 13 people with normal weight, 4 with overweight and 1 person who is obese.

Table 5: Patients BMI

BMI	Female (n)	Male (n)
Normal	6	13
Overweight	1	4
Obese	0	1
Total	7	18

The height and weight of patients have been shown in the table above. According to the Ministry of Health Indonesia, the classification of weight status by body mass index (BMI) was count and it is found that in female patients mostly are with normal weight except for one patient with overweight BMI. While for male patients, there is a mixture of normal weight, overweight and obese but majority of patients are with normal weight distribution.

Spectrum of Leprosy

10 patients (40%) belonged in BL followed by BB type leprosy with 8 patients (32%), in BT and LL has the same distribution of patients which is 3 patients each 12% of BT and 12% of LL. Lastly, is TT with only 1 patient (4%).

Table 6: Spectrum of Leprosy

Spectrum of Leprosy	Number of patients (n)	Percentage (%)
Tuberculoid Leprosy (TT)	1	4%
Tuberculoid Leprosy (TT)	3	12%
Mid-Borderline Leprosy (BB)	8	32%
Bordeline Lepromatous (BL)	10	40%
Lepromatous Polar (LL)	3	12%
Total	25	100%

For the classification of leprosy, it is found that higher number patients suffering from Multibacillary Leprosy (MB) type BL compared to the other types. These findings was supported by the study of which also states that the majority of their patients in their survey was suffering from MB with type BL.⁵

Treatment of Patients

In this study, out of 25 patients, 17 patients (68%) were on Multidrug therapy (MDT) compared to 8 patients (32%) who were not on MDT. In the 17 patients who were on MDT 14 patients were on MB-MDT (Mulibacillary Multidrug therapy) and 3 patients were on PB-MDT (Paucibacillary Multidrug therapy).

Table 7: Patients on Multidrug therapy (MDT)

MDT	Number of patients (n)	Percentage (%)
Yes	17	68%
No	8	32%
Total	25	100%

Higher percentage of patients uses MDT as their treatment while others mainly uses metilprednisolon, clofazimin, and other vitamins. Vitamins are important for leprosy patients as they need more vitamins in their daily diet for example vitamin B6, B12, B1 and many more. Due to the socioeconomic condition of most of the patients they are not able to consume vitamin rich foods. Therefore, vitamin tablets were given to them for daily intake according to their needs. According to WHO also has assured that MDT is given to most MB and PB leprosy patients.²

Patient's Diet

In these 25 patients included in this study, 2 patients (8%) were in high calori, high protein (HCHP) diet, followed by 1 patient (4%) was on low sugar (LS) diet and the other 22 patients (88%) were on normal diet. All the patients were involved in this study had no allergy towards food. High calorie, high protein or HCHP is a meal plan with extra calories and protein. It is a diet for people who have certain health conditions which will increase their body's need for protein and calories. The extra calories will help you gain weight and have more energy while, the extra protein will help your body heal and get stronger. A low sugar diet is a diet which consist of food with low glucose in it. Whereas, a normal diet is where patient consume food with a normal intake of carbohydrate, normal intake of protein and also normal intake of fats.

Table 8. Patient diet

Diet	Number of patients (n)	Percentage (%)
HCHP	2	8%
LS	1	4%
Normal	22	88%
Total	25	100%

In this study also, we have found that most of the patients have a normal diet while only one patient with a low glucose diet and 2 patients have HCHP diet. HCHP diet is done for the purpose of healing the body and retaining the body to a normal nutrition state. Types of food with high calorie and high protein such as meat, fish, eggs, dairy products such as milk, cheese and also nuts. Protein gives energy for the body. A study by Vazquez et al, stated that leprosy disease mainly associated with poverty, dietetic inadequacy related to reduced intake of vegetables, fruits and fish. This findings is similar to our research as well.⁶

Calorie Intake in 24 Hours Dietary Recall

The highest calorie intake among the 25 patients included is 2389 kcal and the lowest calorie intake is 460 kcal. Most patients consume low carbohydrate in their diet. There are 14 patients of leprosy (56%) consume high protein in their daily food intake, while there is only 5 patients (20%) of the 25 patients who were included in this survey consumed normal intake of fat in their diet. There is a same distribution of normal and high calorie intake in a 24 hour dietary recall survey and most of the patients (93%) consume low calorie intake per day.

Table 9: Calorie Intake in 24 Hour Dietary Recall

Intake	Normal		High		Low	
	n	%	n	%	n	%
Carbohydrate	2	8%	1	4%	22	88%
Protein	10	40%	14	56%	1	4%
Fats	5	20%	2	8%	18	72%
Total Energy	1	4%	1	4%	23	92%

As for the calorie intake of these 25 patients, large number of patients consume very low calories intake per day. This leads to low intake of carbohydrate, protein and fats if the patients. This survey is supported by Gosavi et al with the result of their patients are also undernourished corresponding to this study.⁷ Tessanika et al had a very similar findings with this study. In their research the patients has low intake of protein and low calorie intake per day which supported our study.⁸

Intake of Each Food Groups

Out of 25 patients in this research, only 2 patients which is 8% consumed fruits in their daily food intake. The rest of the patients did not consume fruits in their daily food intake. Whereas, all the patients consumed rice. A big number of people (80%) consume meat and fish as the intake of protein and more than half of the respondents consumed vegetables in their daily food intake which is good for health.

Table 10: Intake of Each Food Groups

Diet	Number of patients (n)	Percentage (%)
Rice	25	100%
Meat and Fish	20	80%
Vegetables	16	64%
Fruits	2	8%

According to Salsabilla, a balanced nutritional intake can be obtained from a quality and nutritious food. Food quality and nutritious is food which is consumed according to nutritional needs, not excessive and nothing less. Everyone has different nutritional needs, depending on age, activity, sex and also BMI. Food is an important element for everyone, because not only gives a feeling of fullness but gives energy and nutrition to get do activities. The food which is healthy will be able to contribute to a great growth and maximum adolescent development. Food served should consists of main dish like rice which contain carbohydrates, side dishes like chicken or fish which contains high protein, vegetables and fruits which contains high vitamin, and also milk. This order of food consumption is called *4 Sehat 5 Sempurna*.⁹

As stated above in table 10, only 2 out of 25 patients who attempted this survey consumed fruits in their daily intake of food. This shows that they consume very less vitamins in their food which leads to a suffering from malnutrition. Other than that, all the patients consume rice everyday in almost all their meals. This will lead to an increase of carbohydrate intake which is one of a major intake of nutrient for leprosy patients.

4. CONCLUSION

The major age range that is most likely to get affected by leprosy is from the age 30-50 years according to this study. More male is prone to this disease compared to women. The types of food consumed by leprosy patients are mostly carbohydrate, fat, and protein. The patients in this study are malnourished due to lack of proper vitamins and energy in their daily food intake

5. RECOMENDATION

Further relative research should be done with bigger sample subject with varied location of research. Furthermore, more studies and promotions regarding the types of food consumed by leprosy patients with their food intake should be carried out as it may help the population of Indonesia to overcome this disease and to reduce the ignorance of the populations about this disease.

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