CHARACTERISTIC OF METABOLIC STATUS IN BLIND PEOPLE IN DENPASAR, BALI

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ABSTRACT Background: People with a disability require special attention, especially in the feasibility of daily life. Unfortunately, the health status of blind people with disabilities is not widely reported. Hence, we conduct this study to determine the metabolic status of blind people with disabilities. Method: This is a descriptive observational study with a cross-sectional design. We conducted the study in foster care of blind people with disabilities. A total of 63 people signed informed consent to join this study. We measured the Body Mass Index (BMI) and collected the blood samples to check the random glucose and total cholesterol. Result: The data obtained were analysed, and the result showed that the blood pressure in the subject was normal (57.1%), prehypertension (22.2%), hypertension stage I (15%), and stage 2 (4.7%). Normal BMI (44.4%), overweight (36.5%), Obesity Stage I (11.1%) and Obesity Stage II (7.5%). Normal glucose (96.8%) and hyperglycaemia (3.1%). Normal cholesterol level (73.1%) and hypercholesterolemia (26.9%) Conclusion: The results of this study indicate that persons with disabilities tend to experience hypertension, obesity and dyslipidaemia but a very low probability of suffering from diabetes mellitus.

KEYWORDS  Disabilities, Blind, Metabolic status

Background
People with disabilities have physical, mental, intellectual, or sensory limitations for long periods that limit them to interact with the environment. They are at risk of secondary conditions such as cardiovascular disease and metabolic syndrome. [1,2]

The estimated number of people with disabilities in Indonesia is 3.11%, or about 7.46 million people. Adults with disabilities have different and complex needs regarding their health. If we do not support and facilitate them, they will become unproductive and trapped in helplessness. One of the elements that must be obtained for persons with disabilities is optimal health. Knowing the metabolic status plays an important role, so they can plan an effective strategy to establish holistic health.[3]

Method
This research is a descriptive observational study with a cross-sectional design. The population is persons with disabilities in the city of Denpasar. This research was conducted in December 2019, with 63 people participating. The sample was purposively at a foster care of blind people with disabilities in Denpasar. We measured and recorded the blood pressure, body mass index of each sample, and we collected blood samples to check random glucose levels and total cholesterol levels.

Results
A total of 63 persons with disabilities in Denpasar City participated, with details of the sex of 28 women and 35 men aged 18 - 70 years, blood pressure, body weight, random glucose levels, and total cholesterol levels were measured.

The random glucose levels in persons with disabilities showed that 96.8% were normal, and only 3.1% had hyperglycaemia, as presented in Table 3.
### Table 1 Basic Subject Characteristic

| Variable          | Total (n) | Percentage (%) |
|-------------------|-----------|----------------|
| **Gender**        |           |                |
| Male              | 35        | 55.5           |
| Female            | 28        | 44.5           |
| **Age**           |           |                |
| Minimum-maximum   | 18-70     |                |
| Mean              | 38.4      |                |
| Standard deviation| ± 15.6    |                |
| **Blood Pressure**|           |                |
| Normal            | 36        | 57.1           |
| Hypertension      | 27        | 42.8           |
| **Blood Glucose** |           |                |
| Normal            | 61        | 96.8           |
| Increased         | 2         | 3.2            |
| **Cholesterol**   |           |                |
| Normal            | 46        | 73             |
| Increased         | 17        | 27             |
| **Body Mass Index**|          |                |
| Normal            | 28        | 44.4           |
| Overweight        | 23        | 36.5           |
| Obesity stage I   | 7         | 11.1           |
| Obesity stage II  | 5         | 7.9            |

### Table 2 Description of Blood Pressure in Blind People in Denpasar

| Characteristic                  | N  | %   |
|---------------------------------|----|-----|
| Normal (<120/80)                | 36 | 57.1|
| Pre hypertension (120-139/80-89)| 14 | 22.2|
| Hypertension stage I (140-159/90-99)| 10 | 15.8|
| Hypertension Stage II (> 160/ >100) | 3  | 4.7 |
| **Total**                       | 63 | 100 |

### Table 3 Description of Random Blood Glucose in Blind People in Denpasar

| Characteristic                  | N  | %   |
|---------------------------------|----|-----|
| Normal (Blood glucose < 200 ng/dl)| 61 | 96.8|
| High (Blood glucose >200 ng/dl)  | 2  | 3.1 |
| **Total**                       | 63 | 100 |

### Table 4 Overview of People with Blind People in Denpasar

| Characteristic                  | N  | %   |
|---------------------------------|----|-----|
| Normal                          | 46 | 73.1|
| Dyslipidaemia > 200 mg/dl       | 17 | 26.9|
| **Total**                       | 63 | 100 |
Table 5 Overview of the Body Mass Index in Blind People in Denpasar

| Characteristic     | N   | %   |
|-------------------|-----|-----|
| Normal (18.5-24.9) | 28  | 44.4|
| Overweight (25-29.9) | 23  | 36.5|
| Obesity stage I (30-34.9) | 7   | 11.1|
| Obesity stage II (35-39.9) | 5   | 7.9 |
| Total             | 63  | 100 |

The total cholesterol levels in persons with disabilities show that 73.1% are normal, and 26.9% are experiencing dyslipidemia, as presented in Table 4.

The nutritional status of persons with disabilities are overweight or obese, as shown in Table 5.

Discussion

The results of the blood pressure measurement varied widely. However, it was dominated by normal blood pressure as much as 57%, pre-hypertension 22.2%, stage 1 hypertension 15.8%, and stage II hypertension as much as 4.7% (Table 1). The tendency for persons with disabilities to suffer high blood pressure is relatively high (42.9%). Physical inactivity is a prevalent and modifiable cardiovascular risk factor in people with disability. Lack of awareness of this risk factor can increase the risk of cardiovascular disease.[4]

People with disabilities have a low chance of suffering from diabetes mellitus (DM) (3.1%). DM is caused by internal and external factors; internal factors include genetics and age, external factors include lifestyle and others. The low incidence of hyperglycaemia is not aligned with the study conducted by Jung et al., which stated that diabetes is higher in people with disabilities than in the general population.[3] Further research is needed to determine the causes of the low incidence of hyperglycaemia in persons with disabilities.

In this study, we found that the incidence of dyslipidaemia was 26.9%, which illustrates a tendency for people with disabilities to experience high cholesterol. High cholesterol is caused by internal factors, such as genetics and age, and external factors from diet and lack of exercise. Cholesterol level is an important marker. People with disabilities were less aware of the importance of high cholesterol levels as an important risk factor for metabolic disease.[2,4]

The total of people with disabilities with high BMI is 55.6%, consisting of the overweight by 36.5%, Obese 1 is 11.1%, and Obese 2 is 7.9%. Only 44.4% with ideal body weight. It is suspected that people with disabilities have physical limitations to perform physical movement, which results in a lack of exercise, and all-day activities carried out in only limited spaces. Hence, causing a tendency to become high body mass index.[3,5]

Obesity and dyslipidaemia are less favourable conditions for people with disabilities because those are the risk factors for stroke and heart disease. Patients with dyslipidemia (total cholesterol >200 or LDL cholesterol >130 or HDL cholesterol <35 or triglycerides >150) in the blood vessels will develop atherosclerosis.11 Hence it is necessary to find an activity or an exercise model to burn fat.

Conclusion

The results of this study indicate that persons with disabilities tend to experience hypertension, obesity and dyslipidaemia but a very low probability of suffering from diabetes mellitus. Nevertheless, general check-ups should be performed regularly on people with disabilities for early diagnosis and prompt treatment to reduce the overall cost of health care.

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Conflict of interest

There are no conflicts of interest to declare by any of the authors of this study.

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