



# FOOD-HEALTH CONSIDERATIONS IN A NURSING HOME FOR THE ELDERLY IN SICINSIN, WEST SUMATRA, INDONESIA

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## 24.1 INTRODUCTION

This preliminary study was carried out to investigate food habits and health status of the elderly in nursing home care in Sicincin, West Sumatra, Indonesia. Life expectancy at birth in Indonesians is 59.1 years for males and 62.7 years for females [1]. The elderly were therefore defined as those aged 60 and over.

## 24.2 OBJECTIVES

1. To observe food-health relationships in nursing home elderly populations.
2. To adopt IUNS methodologies and consider their modification in such a way that these are more applicable in developing countries.

## 24.3 METHODOLOGY

### 24.3.1 Subjects

35 elderly subjects (20 men and 15 women), aged 62 to 90 living in nursing homes in Sicincin, West Sumatra, Indonesia were recruited.

**Photo 24.1.** Indonesia, West Sumatra (1992): elderly man residing at the nursing home.



### **24.3.2 Food intake and lifestyle**

Subjects were interviewed using the food habits and lifestyle questionnaires which were developed by Wahlqvist and Kouris [2]. Food intake was assessed by two day food weighing. Nutrient conversion was done using the Indonesian Food Composition Table [3].

### **24.3.3 Body composition**

Standard anthropometric measurements were performed. They included: weight, height, waist circumference, hip circumference, mid-arm circumference, 4-skinfold thicknesses (biceps, triceps, subscapular and hip). Percentage body fat was derived from Durnin and Womersley Table [4].

### **24.3.4 Blood analyses**

About 1 ml peripheral blood was taken after an overnight fast. Fasting blood glucose and Hb levels were assayed.

### **24.3.5 Electrocardiogram**

Electrocardiograms (Fukuda Denshi, Japan 1988) were performed on all subjects.

## **24.4 RESULTS**

### **24.4.1 Social, demographic and historical data**

The sample involved a total of 33 institutionalised subjects, all over 60 years of age whose age distributions are shown in Table 24.1. The 72.0 year median for the 18 males is virtually identical to the 73.0 year for the 15 females. The oldest man was 86 years and the oldest female was 90 years. The distribution of urban or rural origins both as a child and for the majority of adult life is shown in Table 24.2.

**Table 24.1. Male and female elderly in age groups.**

	n	%	Mean	Median	SEM	Min	Max
<b>Males</b>							
60-69 years	5	27.8	65.8	66.0	1.11	62.0	68.0
70-79 years	8	44.4	72.9	72.0	0.99	70.0	77.0
≥ 80 years	5	27.8	82.8	82.0	1.16	80.0	86.0
Total	18	-	73.7	72.0	1.66	62.0	86.0
<b>Females</b>							
60-69 years	2	13.3	67.0	67.0	1.00	66.0	68.0
70-79 years	9	60.0	72.6	72.0	0.87	70.0	78.0
≥ 80 years	4	26.7	82.5	80.0	2.50	80.0	90.0
Total	15	74.5	73.0	1.59	66.0	90.0	

**Table 24.2. Rural and urban background of subjects as children and as adults.**

	Rural	Urban
Male as a child (n=9)	84.2	15.8
Male as an adult (n=18)	61.1	33.3
Female as a child (n=14)	71.4	28.6
Female as an adult (n=18)	57.1	42.9

Tables 24.3 and 24.4 provide data on educational attainment both as the group averages, stratified by gender, and with specific disaggregation by level of schooling. Over 50% of subjects were illiterate, having never attended any formal schooling.

**Table 24.3. Level of education in years.**

Males (n=19)	2.3 ± 0.5 min. 0 years; max 7 years
Females (n=13)	3.6 ± 1.1 min. 0 years; max 11 years

**Table 24.4. Level of education for males and females.**

	Male (n=18)	Female (n=15)
Never (illiterate)	50%	66.7%
<b>Primary school</b>		
- not complete	35%	13.3%
- complete	15%	13.3%

<b>Secondary school</b>	-	6.7%
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Table 24.5 provides data on current marital status. Only two women (13.3%) were married while 80% were widowed. Twice that percentage of men were still married, and only 44% were widowed. The fact that men are older than their spouses at marriage in Indonesia and the longer life expectancy of women could combine to produce the observed gender imbalance for widowhood.

**Table 24.5. Marital status for males and females.**

	<b>Male (n=18)</b>	<b>Female (n=15)</b>
Never married	11.1%	-
Married	27.8%	13.3%
Widowed	44.4%	80.0%
Divorced/ separated	16.7%	6.7%

A further stratification is shown in Table 24.6. Table 24.7 provides a profile of the employment history of the major occupation of the subjects, arranged by gender.

**Table 24.6. Marital status for males and females in age group\*\*.**

<b>Age</b>	<b>Male (n=17)</b>			<b>Female (n=15)</b>		
	<b>60-79</b>	<b>70-79</b>	<b>&gt;80</b>	<b>60-69</b>	<b>70-79</b>	<b>&gt;80</b>
Never married	-	5.9%	5.9%	-	-	-
Married	-	11.8%	11.5%	6.7%	6.7%	-
Widowed	23.5%	17.6%	5.9%	6.7%	46.7%	26.7%
Divorced/ Separated	5.9%	11.8%	-	-	6.7%	-

\*\*Due to small sample size, I don't think it's worthwhile to separate age group.

**Table 24.7. Employment in the past for males and females.**

	<b>Males (n=18)</b>	<b>Females (n=13)</b>
Household	-	38.4%
Farmer	50.0%	23.1%
Government official/ member of armed services	11.1%	-
Private company	5.6%	-

Labour	5.6%	-
Tradesman	22.2%	23.1%
Others	5.6%	15.4%

Table 24.8 provides self-reported health status and medical history. The categories with more than four persons of a given sex reporting the condition are highlighted. Not unexpectedly, hypertension and musculo-skeletal disorders were the leading conditions.

**Table 24.8. Self reported health conditions for males and females (number/ percentage).**

	Males		Females	
Diabetes	2	(5.1%)	--	
High blood pressure	5	(12.8%)	5	(10.6%)
Heart trouble	2	(5.1%)	5	(10.6%)
Circulation problem, hardening of the arteries eg: cholesterol	2	(5.1%)	--	
Arthritis, rheumatism	7	(18.0%)	7	(14.9%)
Stomach ulcer	1	(2.6%)	3	(6.4%)
Emphysema or asthma	2	(5.1%)	3	(6.4%)
Glaucoma	2	(5.1%)	5	(10.6%)
Cataracts	1	(2.6%)	3	(6.4%)
Tumour or growth, cancer	1	(2.6%)	1	(2.1%)
Kidney trouble	3	(7.7%)	2	(4.3%)
Broken bones	1	(2.6%)	1	(2.1%)
Anaemia	2	(5.1%)	2	(4.3%)
Trouble sleeping, insomnia	--		1	(2.1%)
Nervousness, tenseness	--		1	(2.1%)
Urinary tract infection	1	(2.6%)	--	
Uric acid	1	(2.6%)	1	(2.1%)
Constipation	2	(5.1%)	5	(10.6%)
Stomach/ intestine problems	1	(2.6%)	1	(2.1%)

In Table 24.9, the menstrual history (menarche and menopause) are provided for the nine respondents who replied.

**Table 24.9. Age of menarche and menopause the female elderly.**

<b>Age at menarche</b>	
(mean $\pm$ SD, in years)	14.3 $\pm$ 1.0 (n=9)
<b>Age of menopause</b>	
(mean $\pm$ SD, in years)	50.60 $\pm$ 6.8 (n=9)

### 24.4.2 Medication and supplement use

Table 24.10 provides the findings from questioning related to self-reported use of medications. As these were self-reported, and not verified from the medical records, the identities are descriptive and not pharmaceutical in nature. Table 24.11 provides data on self-reported use of vitamin supplements, traditional medicine and herbal medicine. A majority of women, but only about a third of men used one or more of these classes of therapy.

**Table 24.10. Self reported use of medications for males and females.**

	Males (n)	Females (n)
Arthritis medication	2	4
Aspirin	2	1
High blood pressure medicine	2	-
Pills to make you lose water or salt	1	-
Pills for the heart, e.g. digitalis	1	-
Tablets for chest pain e.g. nitroglycerine	1	-
Other prescription medicine	-	1
Antibiotics	3	-
Prescription sleeping pills	1	-
Allergy	1	-
Constipation	1	-
Indigestion	2	-
Bronchitis	2	-

**Table 24.11. Self reported use of vitamin supplements/ traditional medicine/ herbal medicine.**

	Males (n=16)	Females (n=13)
Yes	31.3%	53.8%
No	68.7%	46.2%

### 24.4.3 Dietary intake

Nutrient intake was assessed by 2-day food weighing within the nursing home setting. Shown in Table 24.12 is the breakdown of macro- and selected micronutrients for both genders. Disaggregation of nutrient intake by decade of life is shown for males in Table 24.13 and in females in Table 24.14.

**Table 24.12. Nutrient intakes by 2-days food weighing (mean  $\pm$  SD).**

	<b>Males (n=20)</b>		<b>Females (n=15)</b>	
	<b>mean</b>	<b>(SD)</b>	<b>mean</b>	<b>(SD)</b>
Energy (Calories)	1532	(214)	1452	(275)
(Kilojoule)	6416	(984)	6081	(1151)
Protein (gram)	32.1	(3.6)	30.5	(5.5)
% total energy	21.8	(0.4)	8.4	(0.2)
Fat (gram)	36.3	(0.5)	35.8	(1.4)
% total energy	21.8	(3.8)	23.3	(6.6)
Iron (mg)	7.6	(0.5)	7.3	(0.8)
Calcium (mg)	317.8	(23.0)	304.5	(44.1)
Vitamin A (IU)	164.7	(0.5)	162.5	(5.3)
Vitamin B1 (mg)	0.5	(0.1)	0.5	(0.1)
Vitamin C (mg)	20.9	(0.2)	18.9	(3.6)
Fibre (grams)	4.7	(0.3)	4.5	(0.6)



**Table 24.13. Nutrient intakes for males and age group by 2-days food weighing.**

Age of males	60-69 (n=5)		70-79 (n=8)		>80 (n=5)	
	mean	(SD)	mean	(SD)	mean	(SD)
Energy (Calories)	13.85	(327)	1567	(163)	1625	(10)
(Kilojoule)	5798	(1369)	6560	(682)	6803	(41)
Protein (gram)	29.7	(5.5)	32.6	(2.8)	33.6	(0)
% total energy	8.7	(0.6)	8.3	(0.2)	8.2	(0.1)
Fat (gram)	35.8	(0.9)	36.3	(0.3)	36.4	(0)
% total energy	24.6	(6.0)	21.1	(2.6)	20.2	(0.1)
Iron (mg)	7.2	(0.8)	7.6	(0.4)	7.8	(0.1)
Calcium (mg)	299.1	(38.2)	321.4	(15.9)	327.0	(0.1)
Vitamin A (IU)	164.4	(0.9)	164.8	(0)	164.8	(0)
Vitamin B1 (mg)	0.49	(0.09)	0.54	(0.05)	0.56	(0)
Vitamin C (mg)	20.7	(0.4)	20.9	(0.0)	20.9	(0.0)
Fibre (grams)	4.7	(0.3)	4.7	(0.3)	4.7	(0.3)

**Table 24.14. Nutrient intakes for females by age group (mean ± SD).**

Age of females	60-69 (n=2)		70-79 (n=8)		>80 (n=9)	
	mean	(SD)	mean	(SD)	mean	(SD)
Energy (calories)	1614	(0.0)	1392	(335)	1507	(148)
(KJ)	6758	(0.0)	5830	(1402)	6308	(618)
Protein (gram)	33.6	(0.0)	29.4	(6.7)	31.1	(3.0)
% total energy	8.3	(0.0)	8.5	(0.3)	8.4	(0.1)
Fat (gram)	36.4	(0.0)	35.6	(1.8)	36.6	(0.7)
% total energy	20.3	(0.0)	24.7	(8.4)	21.6	(1.8)
Iron (mg)	7.7	(0.0)	7.7	(1.0)	7.4	(0.5)
Calcium (mg)	326.9	(0.0)	297.4	(54.3)	309.2	(26.1)
Vitamin A (IU)	164.8	(0.0)	162.8	(4.2)	160.6	(8.5)
Vitamin B1 (mg)	0.56	(0.0)	0.49	(0.12)	0.51	(0.09)
Vitamin C (mg)	20.9	(0.0)	18.6	(3.43)	18.4	(5.0)
Fibre (gram)	4.8	(0.0)	4.4	(0.7)	4.6	(0.5)

Almost all of the nutrient intakes were lower than Recommended Dietary Allowance (RDA) (Dietary guidelines, 1980). However, only 10% of males and 26.6% of females have energy intakes higher than the RDA. Protein intakes among males and females were 5% and 26.6% bigger than the RDA, respectively (Table 24.15).

**Table 24.15. Nutrient intakes for males and females which meet RDA (Recommended Dietary Allowances).**

	Normal		<RDA		>RDA	
	Males	Females	Males	Females	Males	Females
Total energy (kcal)	2(10%)	4(26.6%)	17(85%)	5(33.3%)	1(5%)	6(40%)
Protein (gram)	1(5%)	4(26.6%)	19(95%)	5(33.3%)	-	6(40%)
Fat (gram)	-	-	20(100%)	15(100%)	-	-
Iron (mg)	-	-	20(100%)	15(100%)	-	-
Calcium (mg)	-	-	20(100%)	15(100%)	-	-
Vitamin A (IU)	-	-	20(100%)	15(100%)	-	-
Vitamin B1 (mg)	-	-	20(100%)	15(100%)	-	-
Vitamin C (mg)	-	-	20(100%)	15(100%)	-	-
Fibre (gram)	-	-	20(100%)	15(100%)	-	-

**Photo 24.2.** Indonesia, West Sumatra (1992): the kitchen at the nursing home.



**Photo 24.3.** Indonesia, West Sumatra (1992): elderly woman having boiled rice and vegetables at the nursing home.





#### **24.4.4 Anthropometry**

Table 24.16 summarises the anthropometric measurements (stature, weight, circumferences) and derivative indices. The body mass index, broken down by below or above the cut-off of 20 kg/m<sup>2</sup>, is shown in Table 24.17, with the means for the BMIs falling into the subcategories. Table 24.18 shows the categorical distribution of waist/ hip ratio on either side of the gender-specific cut-off values.

**Table 24.16. Anthropometrical assessment for males and females. (mean  $\pm$  SD)**

	Males			Females		
	n	mean	(SD)	n	mean	(SD)
Height (cm)	(n=16)	153.6	(4.9)	(n=15)	142.2	(6.8)
Body weight (kg)	(n=16)	43.6	(5.8)	(n=15)	38.5	(8.3)
Body mass index (BMI)	(n=16)	18.5	(2.3)	(n=15)	18.4	(3.7)
Waist circumference (cm)	(n=13)	70.1	(6.4)	(n=13)	63.4	(7.8)
Hip circumference (cm)	(n=13)	85.2	(5.5)	(n=13)	81.6	(6.5)
Waist hip ratio	(n=13)	0.85	(0.05)	(n=13)	0.78	(0.06)
Body fat (%)	(n=18)	19.0	(4.6)	(n=15)	30.2	(6.6)
Total body fat (kg)	(n=19)	8.3	(3.0)	(n=11)	12.0	(0.53)
Loss of height (cm)	(n=13)	11.6	(4.6)	(n=13)	16.5	(4.0)

**Table 24.17. Body mass index for males and females.**

	BMI <20	BMI = 20-25
Males	17.3 ± 1.5 (n=4)	21.4 ± 2.5 (n=4)
Females	16.6 ± 2.2 (n=11)	23.1 ± 2.8 (n=4)

**Table 24.18. Waist-hip ratio for males and females.**

	WHR < 0.9	WHR > 0.9
Males	0.84 ± 0.04 (n=12)	0.99 (n=1)
	WHR < 0.8	WHR > 0.8
Females	0.74 ± 0.03 (n=9)	0.85 ± 0.03 (n=4)

#### 24.4.5 Laboratory variables

Haemoglobin concentrations tended to be low as shown in Table 24.19. The means for males and females, respectively, were 125 and 113 g/L. The minimum values for the respective genders were 66 and 85 g/L. Fasting blood glucose levels were generally within the normal range (Table 24.20) with equivalent averages for males and females. Shown in Table 24.21 are values for the two sexes for arterial blood pressure. Extreme values are not shown but the means for both diastolic and systolic are within age-specific normal values.

**Table 24.19. Haemoglobin level of males and females (g/L).**

<b>Males (n=18)</b>	
Mean:	125 g/L
SD:	31 g/L
The lowest value:	66 g/L
The highest value:	191 g/L
<b>Females (n=13)</b>	
Mean:	113 g/L
SD:	21 g/L
The lowest value:	85 g/L
The highest value:	155 g/L

**Table 24.20. Blood glucose after fasting 10 to 12 hours for males and females (mg/dL).**

<b>Males (n=17)</b>
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Mean:	81.59 mg/dL	(4.53 mmol/L)
SD:	25.01 mg/dL	(1.39 mmol/L)
The lowest value:	57 mg/dL	(3.17 mmol/L)
The highest value:	161 mg/dL	(8.94 mmol/L)
<b>Females (n=13)</b>		
Mean:	80.00 mg/dL	(4.44 mmol/L)
SD:	23.22 mg/dL	(1.29 mmol/L)
The lowest value:	57 mg/dL	(3.17 mmol/L)
The highest value:	117 mg/dL	(6.5 mmol/L)

**Table 24.21. Blood pressure (mmHg) for males and females.**

	<b>Males (n=17)</b>		<b>Females (n=15)</b>	
	<b>mean</b>	<b>(SD)</b>	<b>mean</b>	<b>(SD)</b>
Systolic	143	(13)	137	(25)
Diastolic	83	(9)	77	(10)

Table 24.22 summarises the interpretation of electrocardiographic findings. Over half of the ECG tracings were read as normal. A diverse variety of abnormalities were found among the others with old ischaemic changes being rare for both sexes.



**Table 24.22. Electrocardiogram for males and females.**

<b>Males (n=18)</b>	
<b>Normal</b>	50%
<b>Disorders</b>	50%
- myocardial ischaemia ant. lat. wall e.g. coronary artery disease	5%
- left atrium hypertrophy	20%
- sinus bradycardi	15%
- ventricular extra systole	5%
- left ventricular hypertrophy (LVH)	5%
<b>Females (n=15)</b>	
<b>Normal</b>	66.7%
<b>Disorders</b>	33.3%
- LVH (hypertensive heart disease)	6.7%
- incomplete RBBB (right bundle branch block)	6.7%
- myocardial ischaemia ant. lat. wall e.c. coronary artery disease	6.7%
- left bundle branch block (LBBB)	6.7%
- first degree AV block	6.7%

#### 24.4.6 Lifestyle and disability

We attempted to gain information on lifestyle habits and specific disabilities. Current smoking habits (Table 24.23) show a minority of either sex had ever smoked regularly. The prevalence of current smokers was about 11.1% for males and 14.3% for females.

**Table 24.23. Smoking habits of males and females.**

	<b>Males (n=18)</b>	<b>Females (n=14)</b>
Smoking regularly	38.9%	21.4%
Smoking regularly but have now stopped	11.1%	14.3%
Have never smoked	11.1%	50.0%
Occasional smoker	38.9%	14.3%

Table 24.24 shows current sleeping habits. Men tended to go to bed later and to arise later than women. Both averaged about the same amount of sleep (Table 24.25). Two-thirds of the men and three-quarters of the women took naps during the day (Table 24.26).

**Table 24.24. Sleeping habits for males and females.**

	<b>Males</b>	<b>Females</b>
Mean time of going to bed	10.1 ± 1.5 (n=18)	8.3 ± 0.6 (n=12)
Mean time of arising	5.1 ± 1.0 (n=18)	4.17 ± 0.8 (n=12)

**Table 24.25. Number of hour of sleep each night (hours).**

<b>Hours</b>	<b>Males (n=14)</b>	<b>Females (n=13)</b>
5	21.4%	7.7%
6	14.3%	-
7	14.3%	30.8%
8	42.9%	61.5
9 - 10	7.1%	-

**Table 24.26. Percentage of males and females who take naps.**

<b>Age Group</b>	<b>Males (n=12)</b>		<b>Females (n=14)</b>	
	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>
60-69	25%	8.3%	7.1%	7.1%
70-79	33.3%	16.8%	35.7%	21.4%
>80	8.3%	8.3%	28.6%	-

The disabilities of note for a nursing home population were urinary (Table 24.27) and faecal (Table 24.28) incontinence. Paradoxically, it was only among the men, 18% of the respondents, that a urinary incontinence problem was noted. Similarly a single man, but no women admitted to a soiling problem. There may be under-reporting bias.

**Table 24.27. Incontinence for males and females in age groups.**

<b>Age group</b>	<b>Never</b>	<b>Occasionally</b>	<b>Frequently</b>
<b>Males (n=17)</b>			
60-69 years	23.5%	-	-
70-79 years	41.2%	5.95	-
>80 years	21.4%	11.8	-
<b>Females (n=15)</b>			
60-69 years	15.4%	-	-

70-79 years	53.8%	-	-
> 80 years	30.8%	-	-

**Table 24.28. Percentage of males and females who soil themselves, by age groups.**

Age group	Males (n=18)		Females (n=14)	
	Never	Occasionally	Never	Frequently
60-69 years	27.8%	-	14.3%	-
70-79 years	38.9%	5.5%	57.1%	-
y> 80 years	27.8%	-	28.6%	-

#### 24.4.7 Exercise

Table 24.29 addresses physical activity in terms of getting out of the building in good weather, that is, during the dry season months. Women tended to stay in whereas men tended to go out. Table 24.30 lists the use of a walker and eyeglasses among the 11 male and 10 female respondents. Only men used walkers in this sample. The disproportion between eyeglass wearers by gender is interesting. Perhaps the illiteracy rate among women makes reading an unessential pursuit and reading spectacles superfluous.

**Table 24.29. Physical activity - "How often do you go out of this house/ building in good weather?"**

	Males (n=17)	Females (n=17)
Less than once a month	23.5%	50%
Once a week or less	29.4%	21.4%
More than once a week	47.1%	28.6%

**Table 24.30. Therapeutic aids used by males and females.**

	Males (n=11)	Females (n=10)
Walker	4	-
Glasses	7	1

## 24.5 DISCUSSION AND CONCLUSIONS

The small sample size of 33 persons makes anything more than a descriptive exercise for the small circle of residents of these nursing homes in West Sumatra to be without merit. However, it is not an unworthy endeavour to develop the familiarity with the concepts and skills for gerontological field research in developing countries and the protective environment of institutions for the elderly is an appropriate starting place. This paper narrates this in the concept of Padang, West Sumatra, where activities like this have been the starting point for the planning of more ambitious survey endeavours in the elderly out in the community and with additional variables in the survey instrument.

If any tentative generalities from the more robust and convergent data can be made it is that energy and micronutrient intakes may be low, that body-size is definitely low, that there is risk of anaemia in many subjects, that sphincteric functions remain intact, and activity levels are low in this population. Although blood pressure medications are taken by some individuals, arterial pressure is in a satisfactory range for the sample as a whole, as is blood glucose. This represents a beginning to the field of ageing biology research in nutrition and health for this part of the Republic of Indonesia.

#### **24.6 SUMMARY**

- This study investigated food habits and health status of 35 elderly (M 20, F 15) aged 60+ in nursing home care in Sicincin, West Sumatra, Indonesia.
- The IUNS questionnaire was used, but food intake was assessed by 2-day food weighing method. Anthropometric measurements performed in the IUNS study were also included and venous blood was assayed for fasting blood glucose and haemoglobin levels.
- Overall, energy and micronutrient intakes were low and there appeared to be a risk of anaemia in many subjects; body-size was low; sphincteric functions were satisfactory and activity levels were low. Although blood pressure medications were taken by some individuals, arterial pressure was in a satisfactory range for the sample as a whole, as was blood glucose.

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## **24.8 ILLUSTRATIONS**

Photo 24.1. Indonesia, West Sumatra (1992): elderly man residing at the nursing home.

Photo 24.2. Indonesia, West Sumatra (1992): the kitchen at the nursing home.

Photo 24.3. Indonesia, West Sumatra (1992): elderly woman having boiled rice and vegetables at the nursing home.

## **CHAPTER 24**

### **FOOD-HEALTH CONSIDERATIONS IN NURSING HOME FOR THE ELDERLY IN SICINCIN, WEST SUMATRA, INDONESIA**

#### **24.1 INTRODUCTION**

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