

GERIATRIC HEALTH STATUS OF THE NOCTE NAGAS LIVING IN ARUNACHAL PRADESH, INDIA

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Abstract: Ageing is a natural and inevitable, time-related deterioration in an individual's physical and mental health. With age, an individual experiences various health problems. Therefore, this study aims to study the health status of the elderly Nocte tribal population of Arunachal Pradesh, India. This cross-sectional study involves 120 elderly subjects aged 60 years and above of both sexes. Anthropometric measurements (Height, Weight, Body Mass Index, Waist-Hip Ratio) and physiological measurements (BP, PR, RBSL, SpO₂) were taken to assess the health status of the participants. Socio-demographic and morbidity status data were also collected. Of the total participants in the study, 19.17% reported having a yearly health check-up, 12.50% were underweight, and 29.16% were overweight. A high percentage of WHR was observed among 31.67% of participants, and it is lower in males (13.79%) than in females (48.39%). The majority (96.77%) reported experiencing some form of health problems during the interview. The most common health problems among them are musculoskeletal problems (83.33%), followed by eye problems (75.83%), Hypertension (64.17%), adhering problems (35.83%).

Keywords: Geriatric health, Nocte Nagas, Arunachal Pradesh, morbidity, musculoskeletal problem

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Introduction

In the last two decades, population ageing has emerged as a global phenomenon, and our nation, India, is no exception. Globally, the population aged 60 and over is increasing at a rate much higher (1.9%) than that of the total population (1.2%), and is expected to increase further (Department of Economic and Social Affairs, Population Division, 2001). Elderly people constitute 10% of the world's population, and this proportion is projected to increase to 21% by 2051 (Kumar et al., 2015). The government of India adopted 'National Policy on Older Persons' in January 1999, and defined the elderly as a person who is of the age of 60 years and above (Government of India, Ministry of Social Justice and Empowerment, 1999). The Sample Registration System (SRS) Statistical Report 2019 projected that the elderly constitute 8.1% of the total population. However, the proportion of the elderly in Arunachal Pradesh is slightly higher (8.8%) (Health Dossier: Reflections on Key Health Indicators – Arunachal Pradesh, 2021). The increase in life expectancy, coupled with a decline in fertility, has led to a demographic transition towards a higher proportion of the elderly population in India (Patle & Khakse, 2015).

This elderly segment of society faces various health-related problems as they age. Common diseases among the elderly include diabetes, hypertension, heart disease, respiratory diseases, and musculoskeletal problems (Kumar et al., 2015; Beard et al., 2016). However, disease prevalence among the elderly varies from population to population. Moreover, the health status of elderly women is generally poorer than that of their male counterparts, primarily due to lower literacy rates, lack of customary property ownership, and limited participation in the labour force (Situation analysis of the elderly in India, 2011). Promoting healthy ageing is the only way to address the challenges of population ageing in India and around the world.

To develop better health policies for elderly care, it is necessary first to understand the health conditions and the prevalence of various diseases across regions within a country or state. However, there are very few macro-studies on geriatric health status in North East India. Therefore, this study was designed to assess the geriatric health status of the Nocte tribe in Arunachal Pradesh using anthropometric, physiological, and biochemical indicators, as well as self-reported morbidity.

Methods

Study Population

This cross-sectional study was conducted among the Nocte Nagas, of Arunachal Pradesh. They primarily reside in the Tirap district, situated in the southeastern part of the state.

Sample size and sample selection

The study sample comprises 120 participants, with 58 males and 62 females. According to the 2011 Indian Census, the Nocte population in Arunachal Pradesh is 1,11,679. The study population lacks documented data on the number of persons aged 60 years and above. However, this age cohort accounted for 8.8% of the state's total population (Health Dossier: Reflections on Key Health Indicators – Arunachal Pradesh, 2021). Based on these two figures, the total number of Nocte individuals aged 60 years and above is estimated at 9,828. Accordingly, using Slovin's formula (1960) with a 10% margin of error, the calculated sample size is 99 participants. Hence, the sample size of 120 for this study is justified. Inclusion criteria for the study were elderly community-dwelling individuals aged ≥ 60 years of both sexes. Before collecting the required data, informed consent was obtained from each participant in the study.

Data collection

The main tool used for data collection was a pretested research schedule designed to collect information on socio-demographic profile (age, sex, marital status, education, occupation, etc.), anthropometric and physiological measurements, and each participant's self-reported morbidity conditions.

The anthropometric measurements collected from each participant are height (cm), weight (kg), and waist and hip circumference (cm). Height was measured using Martin's anthropometer in the upright standing position, with bare feet on a flat surface. Weight was measured using a portable weighing scale with the subject wearing light clothing. BMI is calculated by dividing an individual's weight in kilograms by their height in meters squared (kg/m^2). BMI was categorized according to the WHO classification. The waist and hip circumference of each subject were measured using a measuring tape.

Blood pressure was measured using a digital blood pressure monitoring machine. Diagnosis of hypertension is based on guidelines established by the World Health Organisation and the International Society of Hypertension (World Health Organisation – International Society of Hypertension, 1999). Oxyhaemoglobin saturation (SpO_2) and pulse rate were both measured using a pulse oximeter. Moreover, random blood sugar levels were tested using an electronic glucometer. Data were analysed using relevant statistical software, and results were presented in tables.

Results

The total number of geriatric participants in the study is 120, aged 60 to 90 years. The highest concentration of the elderly is in the 60-65 age group in

years, at 54.33%. The detailed socio-demographic characteristics of the study population are shown in Table 1. The majority of the participants are living with their spouses (87.50%), followed by widowed individuals (11.67%) and unmarried individuals (0.83%). Of all the enumerated individual 60.83% are illiterate. Among all male participants, 72.41% are literate, of whom 34.48% have primary education, followed by secondary (29.31%), higher secondary (5.17%), and graduate (3.45%). In contrast to their male counterparts, only 8.06% of elderly females are literate, of whom 4.84% have primary education, followed by secondary (1.61%) and higher secondary (1.61%). In the case of occupation, 76.67% of elderly participants are farmers, 8.33% are retired government servants, and 15.00% are engaged in other occupations. Among the elderly, 65.52% of males and 87.10% of females are engaged in farming. Conversely, 5.17% of elderly males and 11.29% of elderly females are retired government servants. Nearly half of the elderly participants (49.17%) reported receiving an old-age pension. However, only 19.17% reported regular health checkups, and it was comparatively higher among males (24.24%) than among females (14.52%).

Table 1: Socio-demographic profile of the elderly participants

Variables	Male (n=58)	Female (n=62)	Total (n=120)
	N (%)	N (%)	N (%)
<u>Age (in years)</u>			
60-65	29 (50.00)	35 (56.45)	64 (53.33)
66-70	13 (22.41)	10 (16.13)	23 (19.17)
71-75	5 (8.62)	2 (3.23)	7 (5.83)
>75	11 (18.97)	15 (24.19)	26 (21.67)
<u>Marital status</u>			
Married	53 (91.38)	52 (83.87)	105 (87.50)
Unmarried	1 (1.72)	0 (0.00)	1 (0.83)
Widowed	4 (6.90)	10 (16.13)	14 (11.67)
<u>Education</u>			
Illiterate	16 (27.59)	57 (91.94)	73 (60.83)
Primary	20 (34.48)	3 (4.84)	23 (19.17)
Secondary	17 (29.31)	1 (1.61)	18 (15)
Higher Second- ary	3 (5.17)	1 (1.61)	4 (3.33)
Graduate	2 (3.45)	0 (0.00)	2 (1.67)
Farmer	38 (65.52)	54 (87.10)	92 (76.67)

Govt. service	3 (5.17)	7 (11.29)	10 (8.33)
Others	17 (29.31)	1 (1.61)	18 (15.00)

Elderly pension

Yes	32 (55.17)	27 (43.55)	59 (49.17)
No	26 (44.83)	35 (56.45)	61 (50.83)

Regular Health Checkup

Yes	14 (24.14)	9(14.52)	23 (19.17)
No	44 (75.86)	53(85.48)	97 (80.83)

Body mass index (BMI) and waist-hip ratio (WHR) are two important indicators of health status. Of the total participants, 12.50% are found to be underweight, 27.50% overweight, and 1.66% obese. Thus, compared to underweight, overweight is more prevalent among the studied elderly population. However, the prevalence of overweight is higher among males (29.31%) than among females (25.81%). Based on the waist-hip ratio, 51.67% are at low risk, 16.67% are at moderate risk, and 31.67% are at high risk. However, compared to males (13.79%), high WHR risk is highly prevalent among women (48.39%). It means abdominal or central adiposity is highly prevalent among females in the studied population, and thus, they are at higher risk of developing cardiovascular diseases. At a significance level of $P < 0.05$, only WHR showed a statistically significant association with gender in this population.

Table 2: Gender differences of Anthropometric indices of health status

<i>Anthropometric Indicator</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>	<i>P value</i>
	N (%)	N (%)	N (%)	
<u>Body Mass Index (Kg/m²)</u>				
Underweight (<18.50)	7 (12.07)	8 (12.90)	15 (12.50)	0.973
Normal (18.50-24.99)	33 (56.90)	37 (59.68)	70 (58.33)	
Overweight (25.00-29.99)	17 (29.31)	16 (25.81)	33 (27.5)	
Obese (≥30.00)	1 (1.72)	1 (1.61)	2 (1.66)	
<u>Waist-Hip Ratio (WHR)</u>				
Low risk	43 (74.14)	19 (30.65)	62 (51.67)	<0.001
Moderate risk	7 (12.07)	13 (20.97)	20 (16.67)	
High risk	8 (13.79)	30 (48.39)	38 (31.67)	

Note - WHR: Low risk (Male ≤ 0.95 , Female ≤ 0.80); Moderate risk (Male = 0.96 - 1.0, Female: 0.81 - 0.85); High risk (Male > 1.0, Female > 0.85)

Table 3: Physiological and biochemical indices of health status

<i>Physiological and Bio-chemical Indicator</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>	<i>P value</i>
	N (%)	N (%)	N (%)	
<u>Blood Pressure Level (mmHg)</u>				
Normotensive (<140/90)	17(29.31)	26(41.94)	43(35.83)	0.231
Hypertensive (≥140/90)	41(70.68)	36(58.06)	77(64.17)	
<u>Random Blood Sugar Level (mg/dl)</u>				
Normal	39 (67.24)	46 (74.19)	85 (70.83)	0.352
Pre-diabetic	12 (20.69)	13 (20.97)	25 (20.83)	
Diabetic	7 (12.07)	3 (4.84)	10 (8.33)	
<u>SpO₂ (%)</u>				
Low (<95)	1 (1.72)	3 (4.84)	4 (3.33)	0.404
Normal (95-100)	57 (98.28)	59 (95.16)	116 (96.67)	
<u>Pulse Rate (BPM)</u>				
Low (<60)	5 (8.62)	8 (12.9)	13 (10.83)	0.462
Normal (60-100)	53 (91.38)	53 (85.48)	106 (88.33)	
High (>100)	0 (0)	1 (1.61)	1 (0.83)	

The majority of the participants are hypertensive (64.17%). The percentage of male hypertensive elderly (70.68%) is a little bit higher compared to their female counterparts (58.06%). Based on random blood sugar level, 20.83% individuals were identified as prediabetic, while 8.33% were found to have diabetes. Of the total sample population, the majority (96.67%) show a normal SpO₂ level, and only 3.33% show a low or abnormal SpO₂. On the other hand, the majority of the population (88.33%) shows a normal pulse rate, which is a good sign. However, no statistically significant relationship was found between these indicators and gender.

Table 4: Self-reported Morbidity Profile of the study Participants

<i>Morbidity Condition</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
	N (%)	N (%)	N (%)
Musculoskeletal Problem	43 (74.14)	57 (91.94)	100 (83.33)
Eye Problem	45 (77.59)	46 (74.19)	91 (75.83)
Hypertension	41 (70.69)	36 (58.06)	77 (64.17)
Hearing Problem	20 (34.48)	23 (37.1)	43 (35.83)

Dental Problem	19 (32.76)	21 (33.87)	40 (33.33)
Insomnia	11 (18.97)	23 (37.1)	34 (28.33)
Gastrointestinal Problem	14 (24.14)	15 (24.19)	29 (24.17)
Diabetes	5 (8.62)	5 (8.06)	10 (8.33)
Skin Problem	2 (3.45)	2 (3.23)	4 (3.33)
Nail Deformity	3 (5.17)	1 (1.61)	4 (3.33)
Asthma	3 (5.17)	0 (0.00)	3 (2.50)
Dementia	2 (3.45)	0 (0.00)	2 (1.67)
Malaria	1 (1.72)	0 (0.00)	1 (0.83)
Cancer	0 (0.00)	1 (1.61)	1 (0.83)
Tuberculosis	0 (0.00)	1 (1.61)	1 (0.83)

Different types of self-reported health problems found among the study population are shown in Table 4. The table shows that the most common physical ailments among the studied population are musculoskeletal problems (83.33%). In musculoskeletal problems, female sufferers (91.94%) are more in comparison to their male counterparts (74.14%). Eye-related problems are the second most common health problems, occurring in 75.83% of cases, and are found at similar percentages among males (77.59%) and females (74.19%). Hypertension emerged as the third most prevalent condition, affecting 38.83% of the participants. This was followed by dental problem (33.33%), Insomnia (28.83%), and gastrointestinal problem (24.17%). A smaller proportion of the participants also reported other health conditions, including skin problems (3.33%), nail deformity (3.33%), asthma (2.50%), dementia (1.67%), malaria (0.83%), cancer (0.83%) and tuberculosis (0.83%).

Discussion

With the growing elderly population in India, maintaining geriatric health has become a major public health challenge. Various studies report that individuals with an overweight and high-risk category of WHR have a higher risk of having multi-morbidity compared with normal or low-risk persons (Zhang et al., 2020; Srivastava et al., 2015). Our study reveals that the prevalence of overweight is slightly higher among males (29.31%) than among females (25.81%). Longitudinal Ageing Study in India (LASI), Wave 1 data also show that elderly females demonstrate higher overweight and obesity prevalence than males (Khan et al., 2015). Another study among ageing Tiwas of Assam also shows that the prevalence of overweight among

males (19.23%) is slightly higher than among females (14.39%) (Das and Sarmah, 2015). The use of BMI is criticised for its reduced accuracy in assessing adiposity, especially abdominal fat, among the elderly (Chang et al., 2012). In our study, central adiposity was assessed using the waist-to-hip ratio (WHR). In the present study, 31.67% had a high WHR risk, with a notably higher prevalence among females (48.39%) than males (13.79%).

The majority (64.17%) of the participants were found to be hypertensive, with a very high frequency. A study among urban elderly in Maharashtra reported 33.6% of hypertension prevalence (Patle and Khakse, 2015). A recent study in rural India reported that the overall prevalence of hypertension is 23.8% (Chinnan, 2025). The study shows that 20.83% of the elderly have prediabetes and 8.33% have diabetes. However, another study in Uttarakhand reported very small percentages of elderly individuals with prediabetes (3.2%) and frank diabetes (4.8%) (Saxena, 2012), which are very low compared with the findings of the present study. Conversely, 12% of elderly participants reported having diabetes in a study done among urban and rural elderly, with a higher prevalence observed among urban dwellers (15.7%) than rural dwellers (8.3%) (Thakur et al., 2013).

This study reveals that the most common morbidity among the elderly participants is musculoskeletal problems (83.33%), with a higher prevalence among females (91.94%) than males (74.14%). A study in Varanasi also reports musculoskeletal problems as the most common chronic condition among the elderly (Kumar et al., 2015). Various elderly health studies in India report that women tend to suffer more from musculoskeletal problems than men (Das and Sarmah, 2015; Bhatia et al., 2007), and a similar result is observed in this study. Eye-related problems were reported by 75.83% of participants, whereas only 57.2% reported cataract in a study among rural elderly in Maharashtra (Patle and Khakse, 2015). However, a study conducted among rural elderly in Varanasi reported that 23.1% had diminished vision (Kumar et al., 2015). Hearing problems were reported by 35.83% in this study, and, surprisingly, were very low among rural elderly in Varanasi (6.5%) (Kumar et al., 2015). Another geriatric study in Kasurdi village, Maharashtra, reported that 12.1% of participants had hearing problems (Agarwal et al., 2011). A study among rural and urban elderly in West Bengal reported that 63.1% of elderly had hearing impairment (Thakur et al., 2013). Dental problems were reported by 33.33% of the elderly in our study, whereas a similar prevalence (32.6%) was reported in a community-based study on geriatric health status in West Bengal (Thakur et al., 2013).

Conclusion

The study reveals that the elderly Nocte Naga population are suffering from various health problems. This deteriorating health status of the elderly participants may not be attributed solely to advancing age but also to factors such as inadequate nutrition and limited health care access. The high morbidity load observed in this study indicates the need for regular, free health check-ups at the primary healthcare level for the tribal geriatric population in Arunachal Pradesh. Furthermore, the formulation and effective implementation of policies focused on geriatric healthcare are imperative for fostering healthy ageing in the future.

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