

Quality of Life among Older Adults Living in Low and High Altitude – A Comparative Study

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Abstract: This comparative study aimed to assess the quality of life (QoL) among older adults living in low and high altitudes. A total of 100 participants (50 from low altitude – Chennai, Tamil Nadu; 50 from high altitude – Idukki, Kerala), aged above 60 years, were selected using convenience sampling. The World Health Organization Quality of Life Questionnaire (WHOQOL-BREF) was used to assess QoL across physical, psychological, social, and environmental domains. Data were collected over four weeks and analyzed using descriptive statistics and independent t-tests. Results revealed that older adults residing in low-altitude regions reported significantly higher QoL scores across most domains compared to those living in high-altitude areas. The findings suggest that altitude plays a critical role in determining the quality of life in older adults. Future research with larger and more diverse samples is recommended.

Keywords: Quality of Life, Older Adults and Altitude.

INTRODUCTION

Altitude is an important environmental factor influencing health and quality of life. High altitude (>2400 meters) is associated with lower oxygen availability, leading to physiological challenges such as decreased oxygen saturation, cardiovascular strain, and increased risk of altitude-related illnesses. Low altitude (<600 meters) generally provides better oxygen availability and reduced physiological stress. For older adults, who often face age-related declines in physical and cognitive functions, these environmental differences may significantly impact overall well-being. The quality of life is a multidimensional concept encompassing physical health, psychological well-being, social relationships, independence, and environmental satisfaction. Since global aging is rapidly increasing, assessing the QoL of older adults in different living conditions is crucial. This study aims to compare the QoL among older adults living at low and high altitudes to highlight environmental influences on healthy aging.

METHODOLOGY

- ❖ **Design:** Comparative study
- ❖ **Population:** Older adults (>60 years) residing in low and high altitudes
- ❖ **Sample size:** 100 participants (50 in each group)
- ❖ **Sampling technique:** Convenience sampling
- ❖ **Study areas:** Chennai (low altitude) and Idukki (high altitude)
- ❖ **Duration:** 4 weeks

Inclusion Criteria; Adults above 60 years, Both male and female participants, and Long-term residents of the respective altitudes.

Exclusion Criteria; Individuals with congenital/genetic conditions and Cognitive impairment cases

Tools Used; WHOQOL-BREF Questionnaire: Measures QoL in four domains (physical, psychological, social, environmental).group comparison

Table 1.1 Gender Distribution

Gender	LOW_ALTITUDE_GENDER	HIGH_ALTITUDE_GENDER
MALE	18 (36%)	16 (32%)
FEMALE	32 (64%)	34 (68%)
Total	50 (100%)	50 (100%)

Figure 1: Bar chart depicting the comparison of low and high-altitude gender distribution.

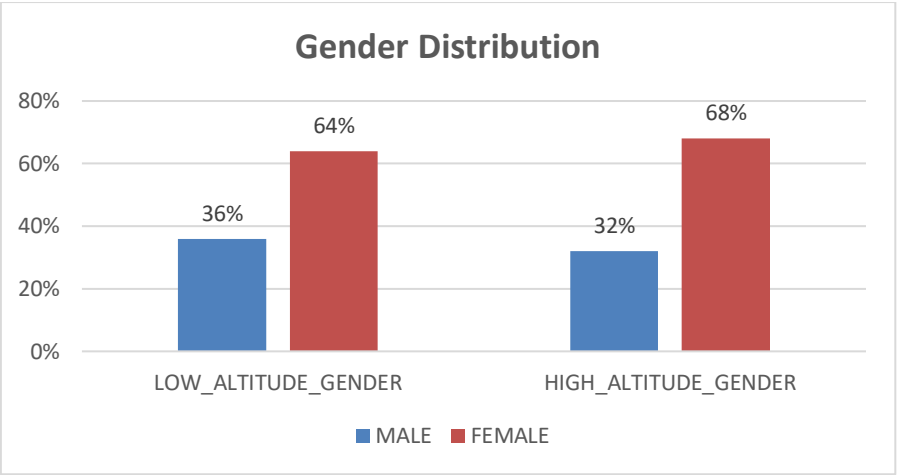


Figure 2: Pie chart depicting the low altitude population size

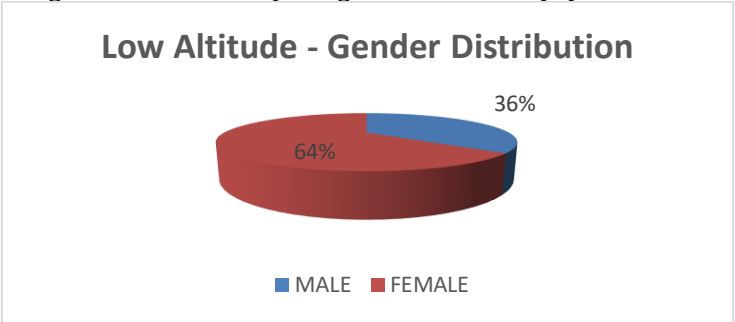


Figure 3: Pie chart depicting the high-altitude population size

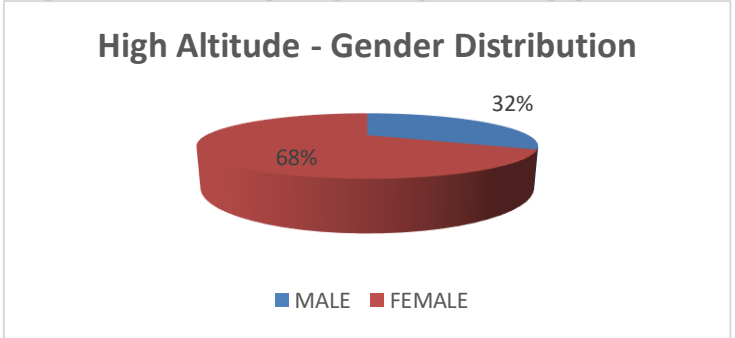


Table 1.2 Summary Statistics for Age and QoL Scores for Low-Altitude Group

Low Altitude Older Adults					
	Count	Min	Max	Mean	SD
Age	50.00	60.00	79.00	68.10	6.37
Domain 1	50.00	20.00	28.00	24.56	2.67
Domain 2	50.00	20.00	24.00	22.38	1.46
Domain 3	50.00	8.00	12.00	9.92	1.45
Domain 4	50.00	25.00	32.00	28.44	2.61
LOW ALTITUDE Total Score	50.00	73.00	95.00	85.30	4.86

Table 1.3 Summary Statistics for Age and QoL Scores for High-Altitude Group

High Altitude Older Adults					
	Count	Min	Max	Mean	SD
Age	50.00	60.00	76.00	65.74	4.99

Domain 1	50.00	15.00	29.00	21.68	3.99
Domain 2	50.00	15.00	24.00	20.36	2.76
Domain 3	50.00	6.00	12.00	9.80	1.47
Domain 4	50.00	19.00	32.00	25.64	3.62
HIGH ALTITUDE Total Score	50.00	64.00	95.00	77.48	7.11

RESULTS;

- Demographics: Majority of participants were female (Low altitude: 64%, High altitude: 68%).
- QoL Scores:
 - Low altitude group reported higher mean scores in physical health (24.56 vs. 21.68), psychological health (22.38 vs. 20.36), and environmental domain (28.44 vs. 25.64).
 - Social domain showed no significant difference.
- Overall QoL: Total mean score was higher in the low-altitude group (85.3) compared to high-altitude group (77.48).

Key Finding

Older adults living in low-altitude environments demonstrated significantly better QoL across most domains compared to those at high altitudes ($p < 0.05$).

DISCUSSION

The study highlights that altitude impacts the quality of life of older adults. Low-altitude environments provide physiological advantages such as better oxygenation and reduced cardiovascular strain, thereby supporting higher QoL scores. High-altitude environments, in contrast, expose older adults to hypoxia, dehydration, and greater cardiovascular workload, which may negatively influence well-being.

These findings align with previous studies (e.g., Pinzon Rondon et al., 2022, Colombia) that reported lower QoL among older adults in high-altitude regions. The results suggest the need for targeted healthcare interventions and lifestyle support programs for elderly populations residing in high-altitude areas.

CONCLUSION

Quality of life differs significantly between older adults residing in low and high altitudes. Low-altitude residents demonstrated higher QoL scores in physical, psychological, and environmental domains. Hence, altitude is an important determinant of well-being in aging populations.

Limitations

- Limited sample size ($n=100$)
- Study restricted to two geographic regions
- Short duration (4 weeks)
- Recommendations
- Larger, multi-regional studies are required
- Longitudinal designs should assess long-term effects
- Healthcare programs should focus on high-altitude elderly populations

DECLARATION: *The authors have no conflict of interest*

REFERENCES

1. WHOQOL Group. Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychological Medicine.* 1998.
2. Pinzon-Rondon AM, Botero JC, Mosquera-Gomez LE, et al. Altitude and Quality of life of Older people in Colombia: A multilevel study. *Journal of Applied Gerontology.* 2022.
3. Paralikar SJ, Paralikar JH. High altitude medicine. *Indian Journal of Occupational & Environmental Medicine.* 2010.
4. Bowling A, Banister D, Sutton S, et al. A multidimensional model of the quality of life in older age. *Aging & Society.*