

Gender disparities in perceived health and functional limitations among institutionalized older adults with Age-Related Macular Degeneration: Implications for secondary chronic pain and multimorbidity

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INTRODUCTION & AIM

Age-related macular degeneration (AMD) is the leading cause of irreversible central vision loss in adults over 55 years worldwide [1]. Although it does not produce direct ocular pain, the severe impairment of central vision significantly compromises essential daily activities such as reading, facial recognition, driving, and independent mobility. This results in a cascade of secondary physical, psychological, and social consequences that markedly reduce autonomy and quality of life [2].

In institutionalized settings, AMD disproportionately affects women, primarily due to greater female longevity, post-menopausal hormonal changes (particularly estrogen decline), and potential sex-specific genetic and biological interactions [3,4]. This gender disparity amplifies the burden of **multimorbidity** (including musculoskeletal disorders, cardiovascular diseases, and frailty) which, together with vision loss, substantially increases the risk of falls, functional dependence, social isolation, and caregiver strain [5]. These interrelated factors are major drivers of **secondary chronic pain**, both somatic (arising from immobility, muscle deconditioning, and musculoskeletal overload) and psychosocial (linked to loss of autonomy, depression, and reduced participation in meaningful activities) [6].

Women living in long-term care facilities frequently experience a heavier functional burden than men, which is often associated with poorer perceived health and lower quality of life. However, it remains unclear whether these differences stem directly from biological sex or are mainly explained by more severe functional limitations in women.

Aim: to examine gender patterns in perceived health and functional limitations (both visual and non-visual) among 314 institutionalized older adults with AMD, and to identify the key non-visual functional domains that most strongly predict poorer perceived health and contribute to secondary chronic pain, with particular emphasis on the greater impact observed in women.

Keywords: AMD, gender differences, institutionalized older adults, perceived health, functional disability, secondary chronic pain, multimorbidity, gender-sensitive care

METHOD

Design and Sample

Secondary analysis of the *Encuesta sobre Discapacidades, Autonomía personal y situaciones de Dependencia (EDAD 2023)* conducted by the Spanish National Statistics Institute (INE). The sample comprised **314 institutionalized older adults** diagnosed with Age-Related Macular Degeneration (AMD).

Women represented 79.3% of the sample (n = 249) and were older on average (88.56 ± 8.14 years) compared to men (85.51 ± 13.39 years).

Variables

•**Outcome:** perceived health status (ordinal variable, 5-point scale: 1 = very good to 5 = very bad).

•**Main predictors:** functional difficulties assessed through 28 items covering activities of daily living, mobility, communication, and manipulation.

•**Covariates:** sex, age, and other sociodemographic characteristics.

Statistical Analysis

1.Exploratory Factor Analysis (EFA): principal Component Analysis (PCA) with varimax rotation was performed on the 28 functional difficulty items. Factors with eigenvalues > 1 were retained (Kaiser criterion), explaining **75.83%** of the total variance. Seven robust factors emerged.

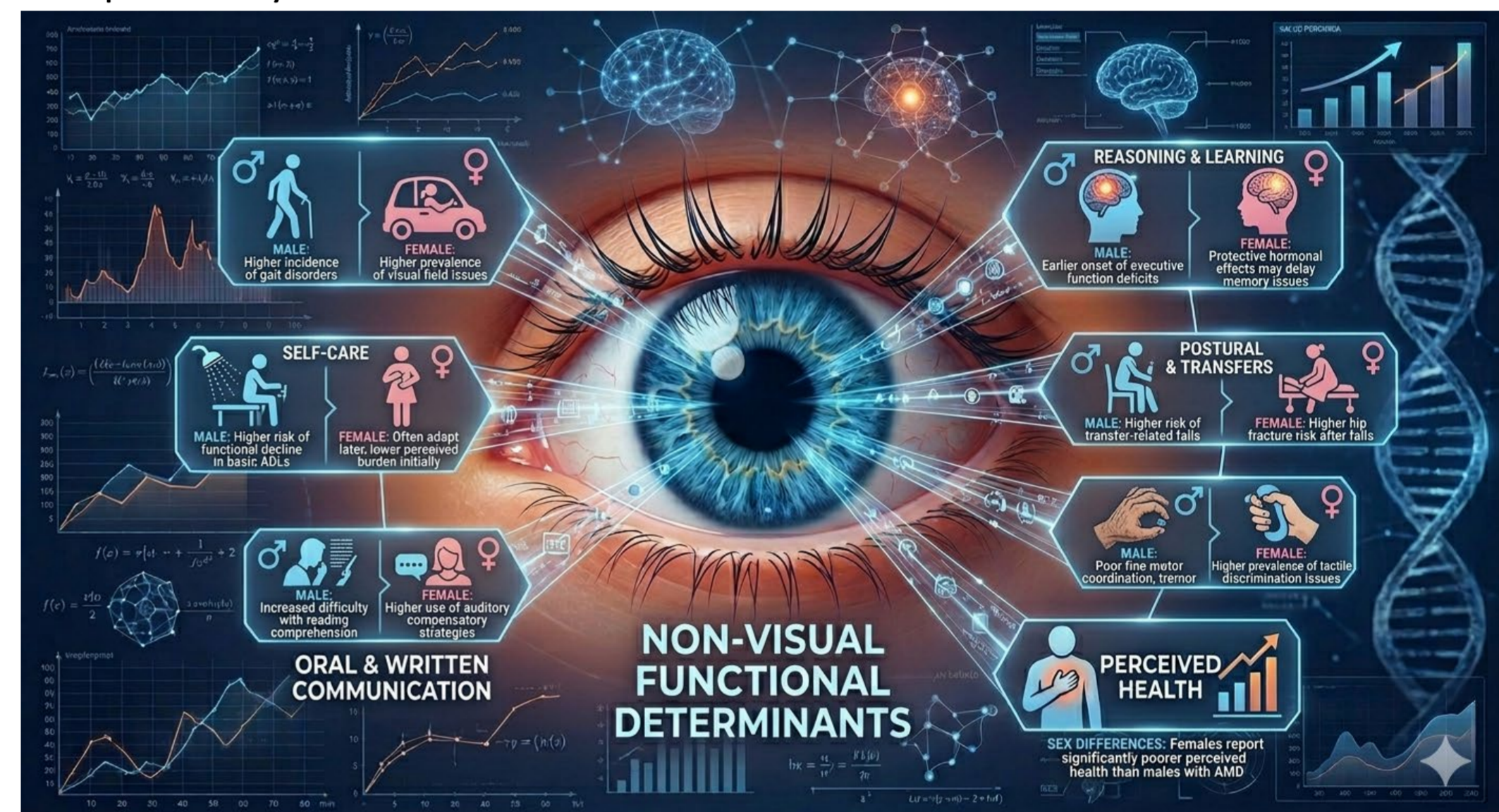
2.Ordinal Logistic Regression: factor scores were used as predictors of perceived health in progressive models, adjusting for sex and age. Model fit was evaluated with McFadden's Pseudo R² and likelihood-ratio χ^2 test.

3.Additional diagnostics: assessment of multivariate outliers (Mahalanobis distance), Cronbach's α for internal consistency (> 0.88 for all subscales), and sensitivity analyses using multiple imputation pooling.

All analyses were conducted using STATA 11.

RESULTS & DISCUSSION

Sample: Women predominated (79.3%, n=249); older (88.56±8.14 vs. 85.51±13.39 yrs), with higher severe disability and poorer health perceptions. 7 PCA factors explain 75.83% of variance (F1 Autonomy in self-care 19.82%; F2 Outdoor mobility 13.74%; F3 Learning 11.50%; F4 Feeding 8.81%; F5 Object manipulation 8.49%; F6 Oral comprehension 7.16%; F7 Manual dexterity 6.31%). Visual difficulty (AMD-specific) did not load on any factor independently.



Ordinal logistic regression (Pseudo R² McFadden=0.121; LR $\chi^2(9)$ =96.42, p<0.001):

- ✓ F2 **Outdoor mobility:** strongest predictor (β =0.410, p<0.001) — loss of mobility outside the facility has greater subjective impact than basic self-care
- ✓ F4 **Feeding** (β =0.188, p=0.035), F5 **Manipulation** (β =0.176, p=0.036), F6 **Dexterity/Communication** (β =0.242, p=0.013), F7 **Oral comprehension** (β =0.221, p=0.012): all predict worse perceived health
- ✓ F1 **Self-care:** paradoxical inverse effect (β =-0.182, p=0.019) — disability paradox: high dependents adapt expectations and rate health more favourably
- ✓ **Sex effect:** non-significant once functional profile is controlled (β =0.023, p=0.934); gender differences in perceived health reflect **more severe functional profiles in women**, not a sex effect per se. No multivariate outliers (Mahalanobis; max=17.74 vs. threshold=24.32).

CONCLUSION

Functional difficulty in institutionalized AMD patients organizes into 7 latent dimensions; outdoor mobility is the dominant predictor of perceived health, above self-care. Two consistent paradoxes emerge: self-care shows an inverse effect and older age predicts better perceived health, both reflecting disability adaptation. Gender does not moderate the functional–health relationship once the functional profile is controlled. Interventions should prioritize outdoor mobility and participation over basic self-care alone, with gender-sensitive approaches to address the higher functional burden in women.

FUTURE WORK / REFERENCES

Data: EDAD 2023, INE, Spain. Future gender-stratified models with psychosocial variables are needed to capture the full variance in perceived health. Sensitivity analyses with full MI pooling confirm substantively equivalent results.

References

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