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ONLINE FIRST

Visual Impairment, Optical Correction, and Their Impact on Activity Limitations in Elderly Persons: The POLA Study

The loss of autonomy among older persons is a major public health issue. In the disablement process model,¹ chronic and acute conditions lead to psychological and physical deficiencies and ultimately to difficulty in performing activities of daily life. In elderly persons, visual impairment is one of the major deficiencies leading to activity limitations and can be caused by either eye trauma or ocular diseases (affecting the ability to receive or process visual information), or by refractive errors (a failure of the eye to focus images sharply on the retina). Refractive errors affect approximately a third of the US and Western European populations.²

We estimated the proportion of uncorrected refractive errors and the potential improvement in daily life functioning that could be brought about by optimal visual correction.

Methods. The POLA (Pathologies Oculaires Liées à l'Age) Study, described in detail previously,³ aimed to identify risk factors for age-related eye diseases. The present study included the 1947 persons, 63 years and older, who completed the 3-year follow-up (1998-2000). Participants were administered standardized questionnaires and were assessed for Instrumental Activities of Daily Living (IADL) limitations⁴ (participants unable to perform without as-

sistance at least 1 of the 8 activities of the Lawton scale). Eye examinations, performed by 5 ophthalmologists in a mobile unit equipped with ophthalmologic devices, included a measure of distance visual acuity in each eye, with the participants' usual optical correction (or no correction if they did not wear glasses or contact lenses) and then with the best achieved correction determined using objective refraction (RM-A7000; Topcon, Tokyo, Japan) and lenses of varying power.

Distance visual acuity was assessed with the Snellen decimal chart and analyzed by extending the World Health Organization taxonomy of visual impairment. "Low vision" (including blindness) and "moderate visual impairment" were defined as visual acuity in the better eye lower than 6/18 and 6/18 to 6/12, respectively. The "unilateral visual loss group" included participants with visual acuity worse than 6/12 for one eye and normal for the other eye and the "normal group" those with 6/6 to 6/12 in each eye.

To assess the proportion of IADL limitations that could be prevented with the use of the best achieved correction, the generalized impact fraction (GIF) of inappropriate optical correction was estimated using equations previously described⁵ and stratified by age group (63 to 74 years vs ≥ 75 years). The age-stratified GIFs were combined using a case-load weighed sum method for an overall GIF.⁶ The 95% confidence intervals (CIs) were obtained by bootstrapping.

Results. Of the 1947 participants 3.0% were excluded owing to missing data, leaving 1887 participants (804 men and 1083 women) for this analysis. The median age was 72.3 years (interquartile range, 68.1-77.0), and 10.3% of participants (195) had IADL limitations.

Moderate visual impairment and low vision were much more frequent in subjects with IADL limitations (39.0% vs 23.3% and 24.1% vs 5.6%, respectively) but not unilateral visual loss. Overall, 38.5% of participants had an inappropriate optical correction, which accounted for 64.5% and 50.4% of the cases of moderate visual impairment and low vision, respectively.

The overall GIF, which represents the fractional reduction of activity limitations resulting from changing the usual visual correction to the best achieved visual correction (**Table**), was estimated at 20.5% (95% CI, 13.6%-27.9%). We were not able to adjust the GIF calculation for all possible confounders because of sparse data⁶; however, age was the only obvious confounding factor when we examined the association between vision and activity limitations (ad-

Table. Number and Percentage of 1887 Subjects With Distance Vision Loss According to Usual and Best Achieved Optical Correction

Usual Optical Correction	Best Achieved Optical Correction, No. (%) of Subjects				Total
	Normal Bilateral	Unilateral Visual Loss	Moderate Visual Impairment	Low Vision	
Normal bilateral	726 (38.5)	NA	NA	NA	726 (38.5)
Unilateral visual loss	353 (18.7)	197 (10.4)	NA	NA	550 (29.1)
Moderate visual impairment	187 (9.9)	116 (6.1)	167 (8.9)	NA	470 (24.9)
Low vision	22 (1.2)	18 (1.0)	31 (1.6)	70 (3.7)	141 (7.5)
Total	1288 (68.3)	331 (17.5)	198 (10.5)	70 (3.7)	1887 (100)

Abbreviation: NA, not applicable.

justing for sex, living alone, smoking, alcohol, body mass index, cardiovascular and cerebrovascular disease, antidepressant use, and hospitalization).

Comment. Among this noninstitutionalized elderly population, the majority of cases of low vision and moderate visual impairment were due to uncorrected refractive errors. One-fifth of IADL limitations could be prevented by use of the best optical correction. Our results underline the importance of including eye examinations in cohorts studying disability and integrating ophthalmic surveillance in routine evaluation of elderly persons.

According to the 2009 American Academy of Ophthalmology recommendations, people older than 65 years should have eye examinations every 1 to 2 years. This is critical not only to detect eye diseases but also to measure refractive errors (which vary with age) and to correct these with glasses or contact lens. Programs designed to provide optical services in this population may contribute to maintaining activities and autonomy in elderly persons.

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Author Contributions: Drs Delcourt and Carrière had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* Delcourt and Carrière. *Acquisition of data:* Colvez and Delcourt. *Analysis and interpretation of data:* Daien, Pèrès, Villain, Delcourt, and Carrière. *Drafting of the manuscript:* Daien and Carrière. *Critical revision of the manuscript for important intellectual content:* Pèrès, Villain, Colvez, and Delcourt. *Statistical analysis:* Daien and Carrière. *Obtained funding:* Colvez and Delcourt. *Study supervision:* Villain and Carrière.

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HEALTH CARE REFORM

Work/Home Conflict and Burnout Among Academic Internal Medicine Physicians

Studies suggest that work/home conflict may have a central role in physicians developing burnout.¹⁻⁵ In a recent comprehensive evaluation of a wide variety of personal and professional factors hypothesized to contribute to burnout in 7905 American surgeons, 3 factors—hours worked per week, experiencing a work/home conflict within the last 3 weeks, and how the most recent work/home conflict was resolved—were independently associated with burnout.⁵ To validate the importance of these factors to physician burnout and to explore whether they are relevant to physicians in specialties other than surgery, we assessed their importance in a large sample of internal medicine physicians at an academic center.

Methods. In the fall of 2009, all faculty physicians in the Mayo Clinic Department of Medicine received a survey with items pertaining to demographics, work characteristics, and experience of work/home conflict, including whether this was resolved in favor of work or home responsibilities or in a manner meeting both responsibilities. These questions derived from the prior study of American surgeons.⁵ Burnout was measured using 2 items derived from the Maslach Burnout Inventory (MBI) shown to stratify risk of burnout in multiple independent samples of physicians and medical students including more than 10 000 participants.⁶ Report of feeling “burned out from my work” at least weekly has a positive likelihood ratio of 14.9 for a high emotional exhaustion score on the full MBI and an area under the curve of 0.94 relative to the full MBI.⁶ Reporting that “I’ve become more callous toward people since I took this job” at least weekly has a positive likelihood ratio of 23.4 for a high depersonalization score on the full MBI and an area under the curve of 0.93 relative to the full MBI. Consistent with prior literature,⁷ participants indicating they experienced symptoms in either domain at least weekly were considered to have at least 1 symptom of burnout.

Multivariate logistic regression models were used to identify and evaluate the relative strength of independent associations of demographics, work-related characteristics, experience of a work/home conflict, and how the last such conflict was resolved with burnout. All sta-