



Influence of Visual Impairment and Depression on Rest-Activity Cycles

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Introduction

Research shows visual impairment is associated with decreased physical activity, and depression has a negative effect on physical activity.^{1,2,3} However, few studies have determined whether depression and visual impairment have independent effects on physical activity.

Using data collected from a community-based sample of older adults, we examined the interaction between visual impairment and depression on physical activity levels using actigraphy.

Methods

Data were collected from sixty older adults (69 ± 6 yrs) who participated in a study investigating relationships between visual dysfunction and circadian rhythms.

Of the sample, 33 were black and 27 were white [women; 71%]. Participants provided physical health data using the Comprehensive Assessment & Referral Examination. They also provided mood ratings using the Geriatric Depression Scale (GDS).

They were examined by an ophthalmologist and wore an actigraph (Actiwatch-L) for 1 week providing rest-activity recordings. Mesor and acrophase of rest-activity data were determined using cosine analysis. Sleep measures were estimated using software provided by the manufacturer (Mini-Mitter Inc.).



Figure 1: Actigraphic device used to measure rest-activity cycles

Results

Participants (85%) reported being in good health: 14% received an eye diagnosis. Participants had an average BMI and GDS scores of 27.68 ± 5.72 and 7.83 ± 4.74, respectively.

The average sleep time, time to bed, and time out of bed were 8.35 ± 3.20; 22.75 ± 1.67; and 6.89 ± 2.49, respectively.

MANOVA results revealed that visual impairment had a significant effect on the level and timing of rest-activity cycles [F = 5.54, p = 0.02; F = 11.86, p = 0.01, respectively]. Results of the factorial MONOVA indicated a significant interaction

between visual impairment and depression on the mesor of rest-activity [F = 4.29, p = 0.04]. With control for depression, a significant correlation between visual impairment and rest-activity timing was found [rp = -0.33, p = 0.01], whereas controlling for visual impairment yielded no significant correlation between activity timing and depression [rp = 0.20, p = 0.13].

Effects of Visual Impairment on Rest-Activity Rhythm			
Variable	Yes Eye Disease	No Eye Disease	F
Mean of Activity	77 ± 34	138 ± 13	5.54*
Timing of Activity	12.79 ± 0.52	14.60 ± 0.19	11.86*

Figure 2: Estimated marginal means and corresponding significant tests using factorial MANOVA, with Bonferroni corrections; *P < 0.05.

Conclusions

Results suggest that visual impairment mediated associations between depression and rest-activity. Early treatment of older individuals who are visually impaired may lead to improved rest-activity cycles, thereby decreasing negative moods and subsequently increasing physical activity.

References: 1. Dunlop, D. et al. (2002), *Archives of Physical Medicine and Rehabilitation*. 83: 964-71; 2. Wetherell, J.L., et al.(2004), *Journal of Psychiatric Research*. 38(3): 305-312.; 3. Mendlowicz, M.V. et al. (1999), *Australian and New Zealand Journal of Psychiatry*. 33: 553-558.