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Mini Review

# Role of Illumination in Reading for Geriatric Population

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**Abstract**

In Geriatrics most common facing difficulty is reading, writing and other visual tasks. Optimal intensity and visual ergonomics standards are necessary along with awareness in geriatric population. Optimal illumination and lighting sources will be beneficiary to the old age people for reading and other visual tasks. All eye care professionals should consider the illumination factor while prescribing suitable aids for old aged patients. In addition to that geriatric population should have the awareness on visual ergonomics standards and this should be initiated and explained by eye care professionals.

**Keywords:** Geriatrics; Visual tasks; Illumination; Reading; Visual ergonomics

## Introduction

In earlier days, old people say that reading under good illumination will be safe to avoid early eye fatigue or complications based on their experiences. However, aging refers to the anatomical and physiological changes associated with the aging process, irrespective of any concomitant or coexisting disease mechanism. The process that causes aging to occur is largely unknown. A decrease in functional cell mass occurs in virtually every organ system, and this also influences on physiological moreover it is a consequence of aging [1]. Visual acuity levels show changes through a person's life. By the seventh decade, a progressive loss in the time required for dark adaptation was experienced. Older readers can benefit by increased levels of illumination and standardized quality of lighting, particularly when supplied in the longer wavelengths. Threshold levels of illumination must be doubled every 13 years for the normal dark-adapted eye to discern an object simply. Pleasant contrast is required for the older eye to detect visual tasks, and stereopsis, along with peripheral vision sensitivity, is often reduced for oldsters [2]. Visual stimuli are major factors in helping to maintain the visual tasks. For older people, an inadequate or improper feedback to the vestibular system was obtained due to decrease in vision. The ability to detect and process spatial information visually is lower in older Adults [3]. This decrement may be worse by age-related health problems, cataract, miosis, changes in the Ocular media, cellular losses in the central nervous system, and the falling off of contrast sensitivity responses in combination with decreases in retinal illumination [4]. Vision for motion targets is less than for stationary targets. However, when target or stimulus moves, a decrease in dynamic visual acuity also observed. Reading performance is also reduced with increasing age due to increase in target or visual stimulus velocity. In senile ages this effect is associated with the function of the oculomotor system and visual tasks [5]. The complexity of visual functions is dramatically reduced in older ages, especially in age related macular degeneration patients. Measuring visual function for these patients is standardized with the help of grating targets and word charts [6]. In Age related macular degeneration patients, determining the luminance with objective measurements to assess the reading performance, shows that an intensity of 2000 lux is necessary and better for improving reading performance in these patients? Similarly, by increasing the task lighting more than 1000lux in older age will augment the ease of reading and also reduces fatigability [7]. Majority of studies concluded that improving the illumination may result in better reading especially in oldsters and age related disorders patients [8]. So, it is quite evident from the literature that, illumination plays a major role in reading and other visual tasks for geriatric population.

## Discussion

The variations in illumination standards influence visual tasks like reading and writing among visually impaired and older population. It is advised that a special ecological and environmental based task is necessary for geriatric population [9]. Older adults were efficient in reading comprehension from the printed page, and young adults were most efficient from computer text. It shows that older age group requires an appropriate illumination for their comfortable reading with printed material [10]. Environmental illumination produces the benefits in older ages as the dark adaptation in the retinal ganglion cells regulates metabolic homeostasis and the psychological stress [11]. Retinal luminance decreases with age progressing followed by pupilary miosis, reduced crystalline lens light absorbance for shorter wavelength and it directly affects circadian cycle and increases the risk of insomnia [12]. Artificial illumination in older age's leads to better retinal photoreception than natural daylight and after cataract extraction optimal intra ocular lens with standardize spectral requirements is necessary and insufficiency intensity results in ocular fatigue [13]. However the role of illumination in old age people is still a big concern. Most of them are facing difficulty in reading, writing or other visual tasks. So proper intensity and visual ergonomics standards are necessary along with awareness in geriatric population.

## Conclusion

The transmission of spectral luminance decreases with the age of the eye crystalline lens loss their capacity to filter and absorb the luminance [14]. Spectral compositions absorbed by retinal photo pigments also influence the visual image [15]. Moreover if optimal illumination and lighting sources will be beneficiary to the old age people for reading and other visual tasks. All eye care providers should consider the illumination factor while prescribing suitable aids for old patients. In addition to that geriatric population should




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also explain about the ergonomics standards during their visit to eye clinic.

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