

Adapting the home environment for people with low vision in the performance of daily activities

Adaptação do ambiente doméstico para pessoas com baixa visão no desempenho das atividades de vida diária

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KEYWORDS:

Low vision; Environment adaptation; Activities of daily living; Lighting; Accessibility.

PALAVRAS-CHAVE:

Baixa visão; Adaptação ambiental; Atividades de vida diária; Iluminação; Acessibilidade.

ABSTRACT

Purpose: To synthesize current knowledge on the adaptation of the home environment for people with low vision and its impact on the performance of daily activities. **Methods:** This narrative review focuses on recent literature on lighting, contrast, spatial organization, home safety, and assistive technologies in low vision, in the context of the International Classification of Functioning, Disability and Health and of the person-environment-occupation-performance model. **Results:** Evidence indicates that environmental interventions in the home improve functional performance, safety, autonomy, and quality of life. Strategies such as optimizing lighting, controlling glare, using color contrast, organizing space, preventing falls, and incorporating assistive technologies exhibit consistent benefits and a good cost-effectiveness ratio. **Conclusion:** The adaptation of the home environment should be considered the central axis of the rehabilitation for low vision. Personalized home interventions are fundamental to increasing social participation, safety, and functional independence.

RESUMO

Objetivo: Sintetizar o conhecimento atual sobre a adaptação do ambiente doméstico para pessoas com baixa visão e seu impacto no desempenho das atividades de vida diária. **Métodos:** Revisão narrativa da literatura recente sobre iluminação, contraste, organização espacial, segurança domiciliar e tecnologias assistivas aplicadas à baixa visão, articulada com a Classificação Internacional de Funcionalidade, Incapacidade e Saúde e o modelo pessoa-ambiente-ocupação-desempenho. **Resultados:** Evidências indicam que intervenções ambientais no domicílio melhoram o desempenho funcional, a segurança, a autonomia e a qualidade de vida. Estratégias como otimização da iluminação, controle do ofuscamento, uso de contraste cromático, organização espacial, prevenção de quedas e incorporação de tecnologias assistivas apresentam benefícios consistentes e boa relação custo-efetividade. **Conclusão:** A adaptação do ambiente doméstico deve ser considerada eixo central da reabilitação em baixa visão. Intervenções domiciliares personalizadas são fundamentais para ampliar a participação social, a segurança e a independência funcional.

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INTRODUCTION

Low vision is a major public health problem that significantly impacts functionality, independence, and quality of life. The World Health Organization estimates that hundreds of millions of people live with moderate or severe visual impairment, with a higher prevalence among older adults and in middle- and low-income countries¹. In Brazil, an aging population and the growing prevalence of chronic eye diseases have led to the need for effective visual rehabilitation strategies.

Historically, visual rehabilitation has focused on clinical interventions and the use of optical devices. However, the notion that the home environment plays a decisive role in the performance of daily activities has been consolidated in recent decades². In this context, adapting the home environment emerges as an essential strategy to reduce barriers to clinical management, promote safety, and preserve functional independence.

The International Classification of Functioning, Disability and Health (ICF) proposes that disability results from the interaction between the individual's health condition and contextual factors, including the physical environment³. Thus, modifying the home environment is not just a complementary measure but also an integral part of the rehabilitation process.

This article presents an up-to-date synthesis of current knowledge on adapting the home environment for people with low vision. Theoretical foundations, scientific evidence, and practical implications for the ophthalmic community have been discussed.

DEVELOPMENT

Theoretical foundation: person-environment-occupation-performance model and ICF

The person-environment-occupation-performance (PEOP) model proposes that occupational performance results from the dynamic interaction between individual characteristics, activity demands, and environmental factors⁴. In the context of low vision, although sensory limitations often cannot be reversed, the environment can be modified to reduce the gap between inability and functional demand.

As a complement to the PEOP, the ICF reinforces that environmental factors can act as barriers or facilitators of performance³. Thus, interventions in the home environment are a key strategy for optimizing functionality, participation, and quality of life of individuals with low vision.

Recent studies have shown that modifications to the home environment improve the performance of daily activities, reduce the risk of falls, and increase confidence in performing daily tasks^{5,6}.

Lighting and glare control

Lighting is one of the most critical elements in adapting the home environment for people with low vision. Inadequate levels of lighting compromise the performance of tasks such as preparing food, reading labels, personal hygiene, and handling medication⁷.

A combination of ambient lighting and task lighting is recommended, with adjustable intensity and even distribution of light. Lamps with diffusers, indirect lighting, and translucent curtains help control glare, especially in the case of individuals with cataracts, age-related macular degeneration, and retinopathies (Figure 1)⁸.



Figure 1. Kitchen sink with natural lighting and even distribution of light.

The modifications must be individualized because the kind of light needed varies according to the ocular disease, age, and the nature of the task performed⁹.

Color contrast, colors, and signage

Reduced sensitivity to contrast is common in several eye diseases and directly affects the identification of objects and spatial boundaries (Figure 2)¹⁰.

The strategic use of color contrast between surfaces, objects, and backgrounds facilitates visual perception and helps avoid mistakes during daily activities. Examples include the use of utensils and furniture in contrasting colors (Figure 3).

In the bathroom, using different colors for the toilet, sink, and wall contributes significantly to safety and spatial orientation (Figures 4, 5, and 6)¹¹.

The combination of tactile and visual signage increases accessibility and promotes functional independence, particularly in cases of progressive visual loss (Figure 7)⁵.



Figure 2. Light switch and lamp positioned near the head of the bed.



Figure 3. Use of household utensils and furniture in contrasting colors.

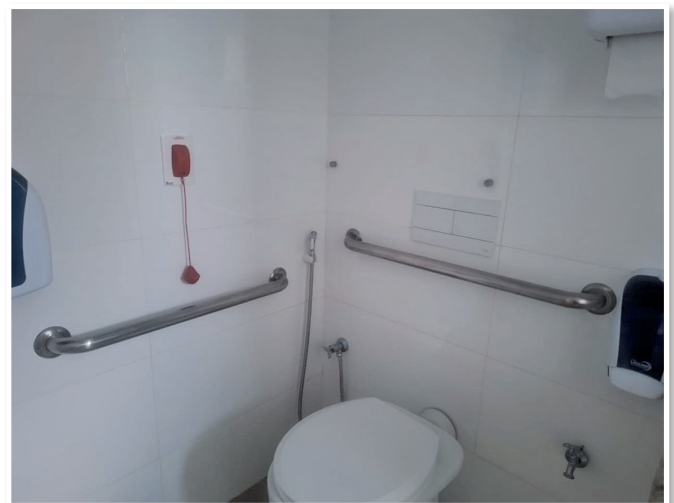


Figure 4. Adapted bathroom with support bars and elements in contrasting colors.

Spatial organization and routine structuring

Disorganized environments increase cognitive load, make it difficult to locate objects, and increase the risk of accidents⁶. Maintaining everyday items in

the same place, reducing excess, and simplifying the space are fundamental strategies.

Predictability of the environment reduces exclusive dependence on visual information and improves functional efficiency. The active participation of the individual in the reorganization process is important for adherence and the success of the adaptations².

Home safety and prevention of falls

Visual impairment is a known risk factor for falls, especially among older adults⁷. Essential measures include removing loose carpets, using non-slip flooring, installing handrails and support bars, improving lighting in circulation areas, and properly marking steps and uneven surfaces.

Home interventions focused on preventing falls lead to greater adherence and a positive impact on safety and confidence in performing daily activities⁵.



Figure 5. Sink countertop with free lower space for better accessibility.



Figure 6. Shower area with support bar and single-lever shower handle.

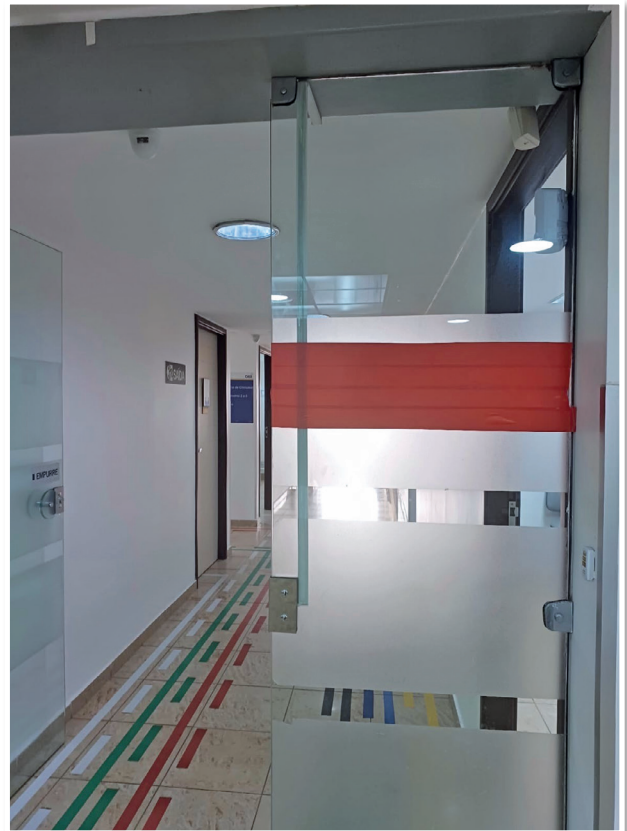


Figure 7. Adaptations in common and external areas of the home with adequate lighting and obstacle-free circulation.

Assistive technologies in home settings

Assistive technologies range from traditional optical devices to digital solutions such as reading applications, object recognition, and voice command assistants¹². The effectiveness of these resources depends on adequate training and their integration into everyday activities and complementary environmental modifications².

Person- and family-centered approach

The adaptation of the environment must take into account emotional, cultural, and social aspects. Visual loss is often associated with insecurity and fear, warranting a sensitive and collaborative management approach⁵. Active participation of the affected individual and involvement of the family favor functional independence and adherence to interventions⁶.

DISCUSSION

Adapting the home environment for people with low vision represents a paradigm shift in visual rehabilitation, with the focus no longer solely on clinical treatment but also on functionality in real-life situations.

Evidence indicates that home environment interventions result in significant gains in autonomy, safety, and quality of life^{5,6}. Strategies such as improving lighting, using color contrast, and preventing falls have shown consistent effectiveness and applicability in different contexts.

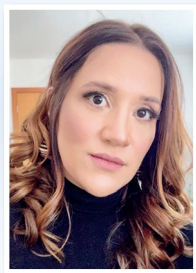
In conclusion, adapting the home environment is an essential strategy for promoting autonomy, safety, and participation in daily activities among people with low vision. This strategy must be understood as

the central axis of visual rehabilitation as it contributes to the dignity, social participation, and the full exercise of citizenship of the affected individuals.

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