Lighting the homes of people with sight loss

Lighting at home is one of the most crucial issues for people with sight loss. Yet very little research has been published on this subject. Indeed, there is no guidance for artificial lighting of the interiors of private dwellings in the UK.

For this reason in 2001 Thomas Pocklington Trust commissioned a one year scoping study on this issue from the University of Reading. This study included initial survey work and a small practical trial.

The study found that:

- the quality of general and task related illuminances in people’s homes varied. In some houses the lighting was very poor quality;
- many participants in the study were aware of the importance of lighting but were unsure how to find out more information;
- transport and travel difficulties prevented many participants in the study from using available lighting options; and
- low readings of illuminance levels in hazardous areas such as stairs were cause for concern.

In the small trial of lighting in individual homes, solutions were seen to be very useful and in most cases favourably rated, though some task related lights were more suitable than others.
Introduction

This paper summarises the content and output of a one-year scoping study concerned with the artificial lighting requirements of visually impaired people in their own homes.

The main outcome of this study is the initial stage in the development of lighting guidance and recommendations for visually impaired people, community care professionals and designers. This work has been carried out by the Research Group for Inclusive Environments (RGIE) at The University of Reading and funded by Thomas Pocklington Trust. Throughout the project the research team consulted an Advisory Panel whose members represented a wide range of disciplines.

Background

An inevitable outcome of the ageing population is an increase in the total number of visually impaired people. However, little research has been carried out on how artificial lighting in a domestic environment may be optimised for visually impaired people. This study aims to address this lack of evidence-based data.

The project has involved the distribution of over 600 questionnaires: 206 of those returned were analysed. In addition, lighting surveys in the homes of 24 people with visual impairments were carried out. In order to assess their performance and acceptability, 25 different lighting solutions were installed in nine of these homes for assessment by participants. An extensive range of results has been obtained from this study.

Levels of lighting

The results from the home surveys carried out in this study show generally low illuminances across a range of tasks and surfaces. The ranges of illuminances measured varied greatly. The lower levels found were often particularly poor.

A Dutch study in 1994 showed that people choose lighting that is best for fine detail, not general illumination. The findings from this study support this to some extent, with the average task related illuminances measured in the home surveys often found to be higher than the average general illuminances in each room.
An earlier assessment by the team of office task related lighting for visually impaired people indicated that participants considered 600 lux to be too dim for reading. The average light level selected by participants for reading was 2400 lux.

In their own homes many participants were, on average, reading under much lower conditions such as 304 lux in the lounge and 236 lux in the dining room. These illuminances were generally accepted by participants.

However, over a quarter of all participants in the questionnaire survey reported that the light levels for reading were poor across all rooms.

General levels of illuminance recorded in the surveys were considered to be low, and were similar to results from other studies. However, measurements varied considerably, ranging from as little as 2 lux to as much as 1429 lux where an additional spotlight was used for a specific task. Low levels of illuminance were often caused by shadows created from poor positioning of the light fittings.

**Levels of lighting in areas of the home**

The surfaces with the greatest negative ratings throughout the homes were always the floors, or the stairs. This may be because floors are used and looked at most during movement as other research by this team has shown. Other surfaces are considered to be less critical and therefore accepted with lower light levels.

Questionnaire respondents generally rated light levels for visually demanding tasks more negatively. However, in the home surveys carried out in our study these tasks were often found to have higher average illuminances than other tasks, although within these figures there were a wide range of measurements.

The measures from the home surveys and questionnaires provide evidence that there is considerable variation in both actual and perceived light levels across rooms in the home and for different tasks.

Results from the surveys carried out indicated that illuminances in the homes surveyed differed greatly, with generally poor
levels of light on the stairs. Given that poor lighting is considered to be a hazard in the home and accepted as at least a contributory factor in the occurrence of falls, these findings are a matter for concern.

On the stairs, 45.2% of the questionnaire respondents reported tripping at some point. Even if most of these happened infrequently, it is still a cause for concern. This is because in many cases it only takes one fall to damage the body or cause harm.

Although the UK Society of Light and Lighting does not issue recommendations for the home in general, they do suggest increasing light levels for hazardous areas such as the kitchen and stairs. Our findings highlight the need for this to be addressed in existing, as well as new build housing.

This study found some evidence linking the light levels on the floors, walls and doors – rather than residual vision – to the frequency of trips in all rooms except the lounge, kitchen and dining room. While our study provides no objective evidence that increase in light levels would reduce frequency of trips, light levels could be a contributing factor at the very least.

This study found that in the home a choice of one or two fittings in each room was most frequent, with a greater choice in the lounge. This may be because more time is spent in the lounge doing a range of tasks compared to other rooms, such as the hall.

Participants may have also focused time and money improving the light levels in this room to the neglect of other important areas, such as the stairs.

**Access to improved lighting**

Our study showed that it is not possible to predict accurately the satisfaction ratings of light levels for tasks from the number of styles of fittings. This is because other factors may be involved, such as the power of the light sources present in the fittings, and other information which was not given in the questionnaire. Examining the combination of effects of wattage and fitting style is needed to investigate further the factors involved in satisfaction of light levels for tasks.
Home survey participants indicated that getting access to stores to purchase lighting was often very difficult for visually impaired people. This highlights a need to provide easier access for visually impaired and older people to a greater choice and range of lighting styles.

In the home surveys, a number of participants indicated problems with energy efficient lamps. For example, often they did not fit properly into lamp shades and took a long time to reach maximum output. These results supported the findings of a recent DTI funded study. As a result of the long warm up time required to reach maximum output, these light sources have the potential to cause people problems. This is because they create brightly lit and dimly lit areas within the home, and adaptations to light levels are a difficulty for many visually impaired people.

However, in the trials of solutions that formed part of the study, problems such as glare from poorly shielded light sources were experienced with this style of lighting during the installation of the fittings. Indeed, one third of questionnaire respondents reported glare at some time from these fittings.

More consideration given to the design and installation of these fittings to shield the light source from view could help to reduce the occurrence of glare.

The conclusion made by Dutch researchers on low vision was that many people do not realise the full extent of how illumination can be improved. This was supported by informal feedback to our Research Team from many health and social care workers. Our results suggested that some knowledge of the benefits of lighting exists, but not the full extent. However, factors such as cost prevent people from changing lights even though they know it will bring about real benefits.

This low level of knowledge of lighting reported during interviews, indicates that there is a need to inform the general public better, both in terms of information on lighting and on where to go for information.

Respondents reported a lack of support from the health and social care professionals who visited them. Only a small percentage of questionnaire respondents received advice on lighting. If these home surveys are representative of the
population then low illuminance levels in the houses visited would suggest that there is a need to improve lighting levels. This lack of support may reflect the lack of specialist knowledge on lighting possessed by the social services or health care workers. These groups need to be informed so they can, in turn, provide advice and support to the public.

In the home survey interviews, cost, inconvenience and lack of access to places to buy and try lighting were cited as key reasons preventing changes to lighting. Access to a range of lighting available on loan would be helpful as it would increase people’s ability to find an appropriate light for their needs before spending money. Given that older respondents were found to be less willing to alter their lighting, easy access to a range of lighting that does not require any physical alterations to the home may be more appropriate.

Increases in both general illuminance and task related illuminances were measured by the Research Team. All nine participants in this trial found the exercise useful. Several of those receiving the lighting solutions were willing to purchase similar lighting products after the trial, providing they could afford them. Three quarters of the solutions were reported as useful both during the day and after dark.

**Implications of the research**

Our project and follow-on research has potential relevance for the future development of key guidelines such as the current lighting codes and standards which currently do not consider lighting in the home. The findings will raise awareness of guidance and training for a range of related professionals and practitioners working with blind and visually impaired people. This could include rehabilitation workers, social services teams, voluntary organisations and trainee building service engineers.

The recommendations will also underpin good and inclusive practice developments and highlight the importance of lighting issues to visually impaired people, whatever their living circumstances and stage of life.

Our findings also have the potential to influence design education policies, as to date very little attention has been paid to the needs of marginalised groups of people,
particularly in architecture, building surveying and product design.

The practical data from this study could be used to develop case studies and related educational material to inform both lecturers and students in the understanding of lighting in the home environment.

Currently the Housing Health and Safety Rating System (HHSRS) does not accommodate the needs of groups such as older and disabled people, but could potentially be extended. Indeed, if the enforcement element of the hazard rating system is removed, it is possible to use it as a tool to assess risk within the home.

In the ‘solution testing’ phase of our study, our findings showed that there were problems with the design of under unit lighting and cupboard lights, as well as glare from these fittings. Our findings indicate that manufacturers need to consider designing lighting as an integral part of cupboard units. They also need to overcome the problems of glare and space restriction within cupboards.

Research from this scoping project will inform future research as well as relevant policies such as the National Service Framework for Older People, particularly in relation to the Older People’s Housing Taskforce.
Conclusions

This study represents a scoping project to investigate existing lighting in the homes of visually impaired people. General and task illuminances were found to be varied between homes with some very low values found in some properties.

Many participants were aware of the importance of lighting but found it difficult to obtain more information.

Transport and travel difficulties led to difficulties gaining access to the full range of available lighting.

Low readings of illuminance in hazardous areas such as the stairs were a cause for concern. Implementing solutions were very useful and in most cases were favourably rated, although some task related lights were seen to be more suitable than others depending on the task in hand.

The data collected and analysed suggests that further research into this field is needed. Further research on a greater number and range of homes in the UK would enable the issues raised in this study to be examined in greater depth.

How to get further information

A short report, in the form of an Occasional Paper, is available on the Pocklington website. The Occasional Paper, entitled “Lighting the Homes of People with Sight Loss” by Lindsay O’Neill, Geoff Cook and Sarah Hill, ISBN no. 0-9546199-3-5, is available in a variety of formats from:

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About Thomas Pocklington Trust

Thomas Pocklington Trust is the largest specialist provider of housing and support services for people with sight loss in England. In addition to promoting services, Pocklington also funds a £750,000 social and public health research budget over a three year period.

Pocklington’s centres offer a range of sheltered and supported housing, residential care, respite care, day services and home care services, together with community based support services. An organisation, with quality assurance systems for its services, Pocklington is fast becoming a best practice organisation in its sector.

Pocklington has centres in Birmingham, Wolverhampton, Plymouth, Middlesex, and two in London. The charity also manages a day service and a community support service in the West Midlands and a Resource Centre in South London. Pocklington is increasingly working with partners to bring new services to people with sight loss living in the local community.

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