

Lighting old age – how lighting impacts the ability to grow old in own housing, part one.

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Abstract. A functionally optimized housing development designed to meet the demands in different phases of living (universal design) may result in the elderly living longer in their own homes. In this study a total of 165 healthy persons were included out of a total of approximately 320 persons turning 75 years of age in 2009 living in Drammen municipality. They went through a quantitative, questionnaire-based interview (including VAS and SF-36) and 20 participants were then selected for a qualitative in depth interview. The lighting conditions in the kitchen, living room, bathroom, bedroom and staircase were measured according to a simplified procedure. The overall lighting conditions were evaluated to be rather low, with means between 35 and 121 Lux, but the quantitative interviews showed that on most questions the scores were rather low, indicating that the overall thriving is good regardless of rather low lighting values.

Keywords: Lighting, housing, ageing, thriving,

1. Introduction

The elderly part of the population in Norway, as in the rest of Europe, will increase significantly during the next decades. It is estimated that in 2050 the mean age will be 47,7 years, and there will be approximately 250 million inhabitants aged 60 years and above [1]. Similar estimations in Norway show that the number of persons above 67 years of age will increase to somewhere between 1.1 and 1.6 million towards 2060; that is approximately a doubling of today's figures. [2]. It has been shown that most people want to live in their own housing as long as possible [3].

The frequency of most illnesses increases with age and also combined illnesses or multimorbidity increases. Among the oldest population (82+) the share of people that will live with illnesses and reduced mobility will also increase. Age related physiologically changes lead to an increased risk for trips and falls etc. often resulting in fractures and other injuries. Similarly, changes in the eyes and visual system lead to reduced visual acuity, reduced contrast sensitivity

and reduced visual fields. These are important factors related to mobility and thrive of living. This implies a demand for higher lighting levels to achieve the same visual input as before. It is estimated that an 80 year old needs approximately 4 times the light level compared to a 20 year old. On top of this will ageing of the human lens result an increased sensitivity to glare. [4].

Reduced visual capabilities may also result in difficulties with activities of daily living (ADL), isolation, depression and reduced quality of life. Approximately 49% of people above 65 years of age have some reduction in their visual capabilities and 3,5% (represents app. 65 000 person in 2020) of these have marked reduced visual acuity due to age related macular degeneration [5].

In addition, we face great challenges regarding the upcoming re-organisation of the health care system in Norway. An outspoken goal from the health authorities is to reduce the time spent in hospitals and nursing homes, and increased outpatient- and home based care. This will of course also have socio-economic consequences, and prophylactic measures to reduce the need for health care will be of great importance.

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A functionally optimized housing designed to meet the demands in different phases of living (universal design) may result in the elderly living longer in their private homes. Authorities and the elderly therefore seem to share the same goal; to make it possible for the elderly to live in their own housing longer.

It will be more cost-effective to adapt the elderly's own housing to the different needs, compared to building new houses. The technological development makes it easier to adapt the housing conditions to different function levels. Studies show that elderly people more rarely move homes compared to younger people and this tendency increases with increasing age [6]. Empirical evidence shows that it is harder to move homes the older you get, therefore it is important to develop knowledge about living conditions that are important for health and thriving at all ages. An important goal is to make the housing conditions functional for both healthy people and people with illnesses and/or functionally disabled. Light, both natural and indoor lighting is an important factor in meeting the different demands of house designed to different functionality demands related to health and age of the inhabitant. Optimized lighting could prevent home accidents that are more frequent among the elderly. Studies have shown that lighting also contributes to a good mental health [7]. In a study among people with subnormal vision, Cullinan et al 1979 showed that increased indoor lighting also increased vision significantly [8].

2. Aims

Are there correlations between optimised lighting and better thriving, less accidents and better living conditions among healthy 75 year olds inhabitants in Drammen municipality?

3. Methods

3.1. Participants

A total of 165 participants with informed consent were included in the study out of a total of approximately 320 persons turning 75 years of age in 2010 living in Drammen municipality. To be included in the study they had to live in their own housing, being healthy, not getting any home-based care and having a visual acuity of equal to- or better than 6/9 (20/30) measured binocularly with their best correction.

3.2. Design

The total study consists of three phases. One baseline study which involved interviews and evaluation of the lighting conditions in the participant's private housing. Phase two is an intervention study, where 30 homes are selected among the participants that scored 50% or lower on the lighting evaluation. Phase three is a second round of interviews of the intervention group and a non intervention control group to evaluate the effect of the intervention.

Two types of interviews are performed. All participants went through a quantitative, questionnaire-based interview (including VASC and SF-36) to investigate vision and health, and how indoor lighting levels affected everyday tasks. 20 participants were then selected for a qualitative in depth interview. The interviews were done in cooperation with Drammen Municipality, Team for Preventive Home Visits. Drammen municipality has an organised system for preventive health care, where the nurses in the preventive team invite themselves to visit every inhabitant in Drammen, in the year they turn 75 years of age. This is a prophylactic measure in order to evaluate any needs for home care or other supportive activities from the municipality. People already in home-based care programs or staying in nursing homes etc do not get these visits. During this visit, participants were asked to join into this study. A relative simple light measurement was executed in the participant's private housing. It also included a screening test of visual acuity. A questionnaire regarding health, quality of living, lighting and light related factors was filled in at the same time. Qualitative interviews were done on a subgroup in order to obtain in-depth knowledge of the participants own experience related to health, lighting and function.

3.3. Light measurements

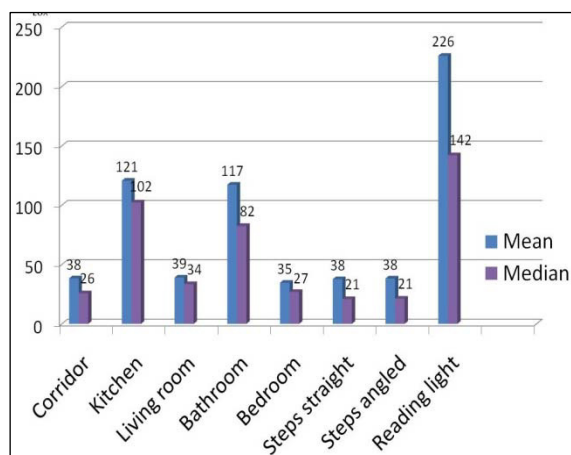
Light measurements was done according to procedures outlined in Bjørset, H.H 1986 [9], slightly adapted to conform with differences from offices to private homes. A standardized scheme and a standard procedure were developed. The rooms were divided into 1 by 1 meter grid, and the measuring heights were 80 cm above floor level. The lighting conditions in the kitchen, living room, bathroom, bedroom and staircase were measured according to this procedure. The measurements were performed with a Hagner Screenmaster (B. Hagner AB, Box 2256, SE-169 02 Solna, Sweden). All measurements were performed

after darkness, and the contribution from street lights were negligible.

4. Results

4.1. Light condition

The overall lighting conditions were evaluated to be rather low, with means between 35 and 121 Lux. When looking at the median values, they do not differ a lot from the means, indicating a rather evenly distribution of the values. The values marked "reading light" give the numbers of Lux measured directly on the reading.



4.2. Thriving

The quantitative interviews showed that on most questions the scores were rather low, indicating that the overall thriving is good regardless of rather low lighting values.

5. Discussion

The thriving among 75 year olds in Drammen is high, in spite of the fact that indoor lighting levels are low. Our results indicate that knowledge and awareness about lighting is poor. To maintain healthy ageing at home, more information on how to optimize indoor lighting is needed.

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