

Health Promotion by Design in Elderly Care

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Objective: The overall purpose of this study was to systematically investigate the requirements of health promotion by design in elderly care and to identify the specific supportive design conditions contributing to the promotion of healthy living and working environments.

Methods: We developed and used a combination approach based on the Future Workshop model whereby a reference group consisting of thirty persons participated in a series of workshops, seminars and field studies. A questionnaire directed to the health care staff included subjective measures of health using the Sense of Coherence Scale, a Health Index Scale and a section of questions developed by the authors regarding the experienced physical environment. The study was carried out at Vårbergs Nursing Home in Stockholm, Sweden during the year 2004.

Results: The results pointed to a correlation between experienced health and sense of coherence among health care staff. The importance of the physical living and working environment for health rated higher compared to existing environmental conditions. Specific and essential design requirements for healthy living and working environments in elderly care were identified and recommended.

Implications: This research demonstrates a much needed development of organizational values and non-pharmacological approaches within elderly care operations. The designed environment must be regarded as the most enduring of these approaches. This requires a deeper understanding of the interaction between the physical environment and the aged person in this particular setting. The preconditions of health among the elderly will most likely be improved through the use of non-pharmacological approaches such as psychosocially supportive environmental design.

Keywords: Elderly care, Health promotion, Environmental Design, Health

Introduction

The population of elderly is significantly and rapidly growing in Sweden, in Europe as well as in North America, increasing the demand of health care services for this segment of the population. Simultaneously, attitudes and perspectives on ageing are changing. A conscious and well-educated generation with new points of reference is emerging. The prosperous western society has created larger economic possibilities for an active and rich life for seniors far

into old age. This development poses demands for changes both in health treatment and in the physical environments for the elderly. An additional challenge within elderly care is the high levels of sickness absence among health care employees as well as the shortage of a competent workforce. A well designed environment may provide a supportive psychosocial work environment, attracting well educated staff and encouraging healthy activities among health care staff.

The fundamental principle of this study was to meet the needs for humane living conditions amongst the elderly population by designing supportive elderly care environments which promote health and well-being. These values may be realized through the conscious design of physical environments based on experiences of staff, family members and the elderly residents. The goal included the analysis of health promotion using designed environments for the elderly in future planning. Elderly care facilities provide a living environment for ageing residents and also constitute a workplace for employees. It is therefore important that the improvement of both environments is concurrent. The transformation of Vårberg Nursing Home into a new built environment forms the foundation for this research and development project.

Background

Resources for health services and care for the elderly are at the present time insufficient and strained in Sweden. Therefore, new methods for improving effectiveness and quality control must be developed. A report of current conditions from the Swedish National Board of Health and Welfare (Socialstyrelsen, 2003) described the current situation as problematic. Vast difficulties of recruiting and keeping competent staff are identified and constant high levels of sickness absence are mentioned in this context. The consequences of these conditions are difficult to assess but the National Board of Health and Welfare warn that these changes will affect

the elderly with few resources particularly hard. The National Board of Housing and the Swedish National Board of Health and Welfare conclude that there is a significant downsizing of beds in municipal elderly care facilities around the country (Socialstyrelsen, 2004). The report warns for a much too rapid and sometimes poorly planned cut back of elderly care. There may be a relatively large group of elderly for which a prolonged stay in the private home with home-care services are not enough.

Currently Sweden and Italy have the oldest populations in the world. Over 17 percent of the population is sixty five years or older (Statens Folkhälsoinstitut, 2002). At the same rate as the number of really old people increases, the number of elderly with dementia is also growing. Europe faces a great challenge to meet healthcare needs of an ageing population when at the same time the average age of the health care professional is increasing. A large part of the population in Europe is currently over sixty and that number is expected to double within 25 years. In 2050 it is estimated that Europe will be inhabited by more +50 year old individuals than persons under the age of fifty (Socialstyrelsen, 2004).

The basic preconditions for a good life in old age are basically the same as for younger individuals; a secure economy, good health, a functioning social network, meaningful occupation and to be able to control one's own life (SOU 2003:91). However, when working life is left behind, a number of habitual activities are suddenly removed which must be replaced by other stimulating and meaningful engagements.

Throughout the aging process, physical functional losses may be compensated for, muscle mass and bone density decreases gradually with age but may be counteracted by suitable exercise even at a very senior age. Oxygen uptake capacity may be improved considerable through cardio vascular training such as swimming, bi-

cycling and walking. An improved cardio condition offsets tiredness and makes independence more possible with older age. A good overall condition lowers the risk for depression and anxiety (Folkhälsainstitutet, 1997).

The need for mental and intellectual stimulation is unchanged in old age. The ability to learn and remember needs continuous encouragement to stay intact. The environment we live in is important in this regard. We need varying stimuli daily, requiring us to remember as well as exercise the memory. Intellectual stimulation has good health effects; stress reduction, physiological improvements on pulse and blood pressure and improved rehabilitation after coronary arrest (Norling, 2002). An active social life which includes time with relatives and friends has an impact on overall health.

The experience of social belonging may prevent early mortality, stunt the onset of disease and speed up recovery. Interestingly, social connections may actually function as a biological release mechanism, stimulating the immune system to mobilize defense against various diseases and stress. Social involvement may according to Mendes de Leon, Glass & Berkman (2003) be an important factor in preventing functional loss among the older population.

Research on ageing as a phenomenon has focused primarily on the problems relating to ageing rather than on the description of successful and good ageing. However, there is a growing interest in the health promotion features of the later life cycles as a contrast to the pathogenic preoccupation of ageing. These thoughts have been gathered under the concept of salutogenic ageing.



Figure 1 *Balcony and seating outdoors*

The theory called “Sense of Coherence” developed by Antonovsky (1991), concerns the individual general resistance resource against stress. The theory is based on three main concepts; comprehensibility, manageability and meaningfulness. It explains why some individuals exposed to various forms of stress are able to maintain good health. Sense of Coherence may be generalized to the good ageing which in itself contains good health. A study of seventy year old persons revealed a high correlation between sense of coherence and health which had its origin in the memory of one’s life history. The study confirms the importance of earlier experiences and the recollection of these in relation to the sense of coherence and well being in old age (Rennemark & Hagberg, 1997).

Elderly and the Physical Environment

The physical environment has according to Lawton & Nahemow (1973) three main functions; the aesthetic, the objectively functional and the subjectively functional (individual demands and preferences regarding function). Successful ageing according to these authors is a process dependent on the balance between individual abilities and the demands from the surrounding environment. When an individual experiences life as more demanding such as in the state of illness, the ability to manage stress from the surrounding environment is reduced. Various functional losses in connection to ageing may affect the degree of negatively experienced stress. It is therefore important that the surrounding environment is adjusted and improved to fit the remaining abilities of the older person in relation to his or her environment.

The elderly care facility has two main design functions, as a home environment for the residents and as a work environment for the health care staff. These dual functions place complex demands on the character of the physical environment. A home like environment may promote health, increase overall satisfaction and support the remaining abilities of elderly resi-

dents. However, the space as a work environment also places specific requirements on the physical environment which may be conflicting with the criteria for an optimal residential environment.

Creating the optimal conditions for health and a good life in old age requires access to the following components developed by the authors: Vita Activa – to be able to work and experience participation in a productive context, to make sure the elderly person is stimulated and encouraged to an active life through occupational therapy, physical activity or taking part in daily chores. Vita Contemplativa – to nourish the inner life through social contacts, to make sure the elderly person is given the possibility to participate in cultural and mental activities such as dancing, singing and discussion groups. Vita Ristorativa – to take care of physical needs for rest and recuperation, to make sure the elderly person has the option of peace and quiet in calm surroundings.

Human understanding of the surroundings is dependent upon human sensory and cognitive abilities. Limited sight, lost memory and impaired concentration usually occurs at some point in the ageing process. Dementia disorders also bring a number of specific difficulties which are related to the physical environment. The sense of space, orientation ability (Gustafsson, 1996; Kaske & Storandt, 1995; Wallin et al, 1994), difficulty processing information from the environment and reduced recognition ability (Bäckman & Herlitz, 1996) are some examples. A lost ability to comprehend and understand the surroundings present a feeling of unsafety which in turn may lead to negative health effects such as stress and depression (Wijk, 2004).

The living environment is fundamental in daily life for the elderly and must be designed to meet their needs as they experience difficulty understanding the environment. The home may be understood as a sphere of integrity and self

governing and has a symbolic value in a deeper sense. Furnishings and personal objects are reminders of one's life history anchored in various episodes of life.

During the later years of ageing, remembering is of great value which makes these items even more essential. A relaxing and safe milieu is not only about creating comfort but also a strategy making the most of remaining cognitive abilities of the elderly resident with dementia (Ericsson, 1991). The homelike environment has a therapeutic function aiming to strengthen residents' resources to postpone the degeneration of cognitive abilities (Gaunt & Lantz, 1996). According to Ericsson (1991) the homelike physical environment is important for the elderly with

dementia in the following ways; encourage independence, support social belonging, provide safety, arouse recognition, offer physical activity, orientation and stimulation of the senses.

A supportive surrounding gives residents the possibility to use more of their energy for social interactions rather than for orientation. In this way they can become more socially involved (Baksi & Cradock, 1998). A feeling of safety and control in the physical environment is a psychosocial factor which may reduce various stress symptoms. Psychosocially supportive living and working environments may strengthen the individual's ability to manage situations which are often experienced as demanding (Dilani, 2001)



Figure 2 Spacious private room with personal objects

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The residential setting has an important role as a platform for the immediate social environment, a meeting ground where the mealtime is one of many arenas for interaction. The desire for food is clearly influenced by elements in the physical environment, in the social atmosphere and in connection to new relationships (Jansson, 1993).



Figure 3 *Nature contact from kitchen and dining areas*

Outdoor activities promote health contributing to the experience of joy and meaningfulness. The possibility to reflect in nature stimulates senses and cognitive abilities of the elderly. There is also value in viewing the outdoor environment from the inside, especially for the elderly with functional restrictions (Norling, 2002). Creatively active elderly people seem to have a more positive outlook on the remaining years of their lives. This may be due to the sense of being an active creator of one's own life instead of being a passive "victim" of the ageing process according to Smith (1990).

Music may be used actively (to create music) or passively (to listen to music) with the sole purpose of promoting health. Therapeutically,

music may reduce stress, anxiety and pain for the elderly (Aldridge, 1993). Music may also be used by health care staff to add a calming element to an agitated situation. Sound and music may also provide a relaxing and comforting function to assist with sleeplessness as a complement to pharmacological treatment (Lindemuth et. al, 1992). Music in combination with exercise has proven to have positive cognitive and physical effects for the elderly (Hagen, et. al, 2003).

Color, form and lighting collectively contribute to the overall sense of space. Light is an important aid for the elderly who often have some form of sight impediment (Brunnström, et al, 2004). Perception of color is according to Wijk (2004) well retained in old age including the elderly with dementia. The use of colors in residential environments has been used successfully to support the elderly in daily life and is a tool in compensating for lost abilities.

Most of the cognitive limitation and sight impediments can be compensated for by a more comprehensible visual environment. Pets may have several important functions for the elderly in the residential environment and serve in health promotion. Pets help the elderly maintain an active life style, to quickly recover from disease and help in improving the immunity system according to Bergler (1992). The psychological benefits of pets in the residential setting include improved sleep, reduced depression and anxiety as well as less aggressive behaviors (Fine, 2000).

Method

The method selected for this research study is based on the Future Workshop model including five structured workshops. The model was combined with five field studies, five educational seminars including external presenters and a questionnaire directed to the health care staff. This research also included an extensive literature studies. A reference group consist-

ing of twenty seven individuals involved in the nursing home was selected to participate in the activities. The represented professionals were; nurses aids, licensed practical nurses, registered nurses, head nurses, occupational therapists, physiotherapists, speech pathologist, administrators, family members and representatives from the county council.

The Future Workshop

The Future Workshop is a structured process using experience and knowledge of front line staff consisting of the following five phases; preparation, critique, vision, implementation and follow-up. The preparation phase was started in the beginning of 2004 with a number of seminars regarding life conditions and living environments of the elderly, vis-à-vis the working environment of health care staff in elderly care. The Critique Phase is considered to be a time for problem inventory concerning general working and living conditions. This includes documenting existing qualities of the physical environment which may be experienced as challenging in the daily operations. The next step is to prioritize the most important critique by individual

voting. The top-ten results from the critique phase are listed:

1. Inadequate rooms/apartments	96 p
2. Too large units	95 p
3. Tight bathrooms	70 p
4. Long corridors	53 p
5. Lighting and ventilation	33 p
6. Understaffed units	29 p
7. Mixed categories of elderly in the units	28 p
8. Limited availability to the outdoors	25 p
9. Too many floor levels	23 p
10. Colors creating anxiety	16 p

The reference group then made study visits to a number of elderly care facilities. All homes relatively newly built in the region of Stockholm and were considered interesting in the planning of a new nursing home. The purpose of the field studies was to inspire and provide a frame of reference regarding various design solutions and environments in elderly care. The field studies supported the transformation from the Critique Phase to the Vision Phase by providing an experience of various qualities of rooms and spaces.

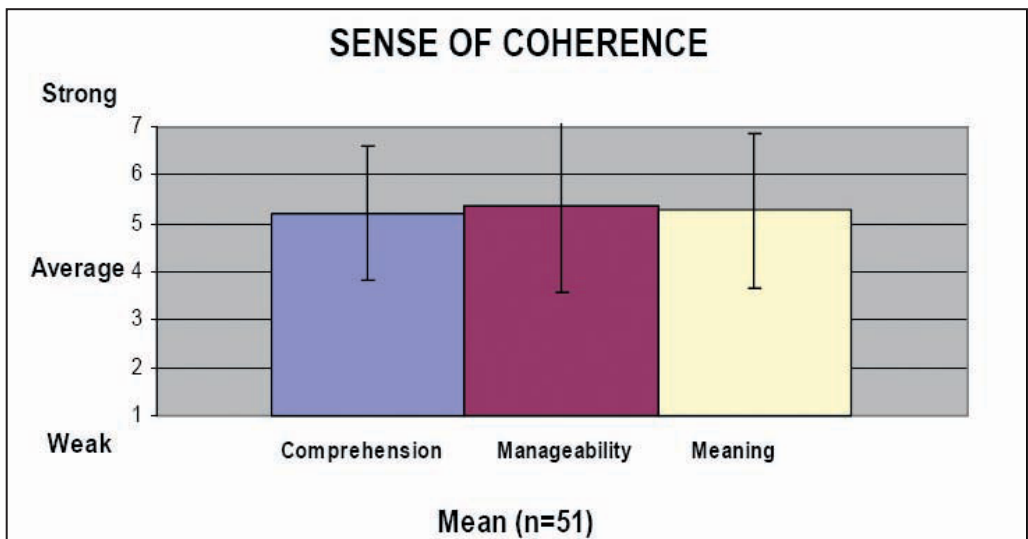


Figure 5 Sense of Coherence divided into comprehensibility, manageability and meaning illustrated with mean and standard deviation.

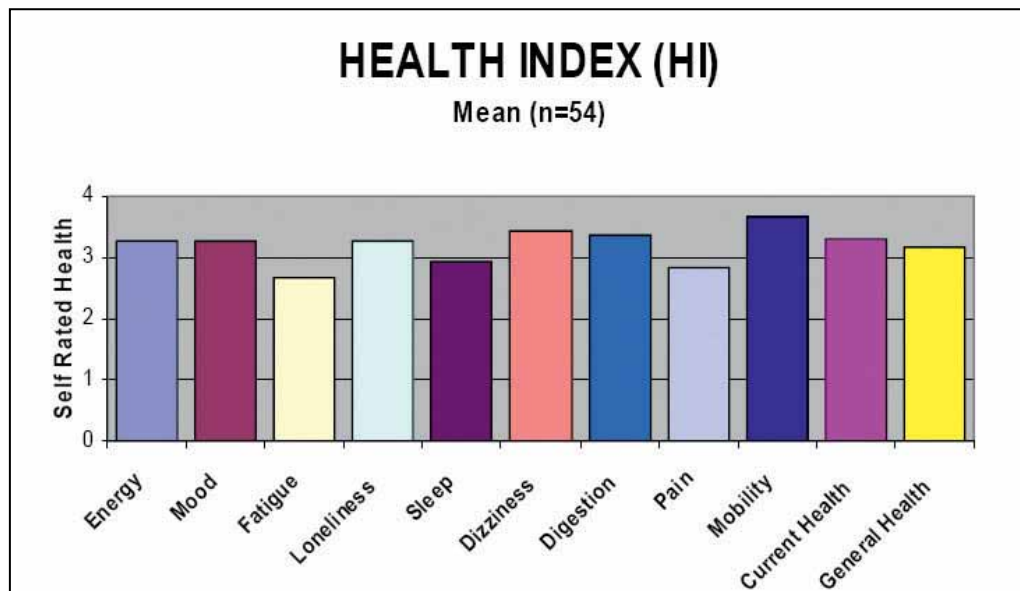


Figure 6 Self rated Health Index consisting of eleven health factors, illustrated in mean.

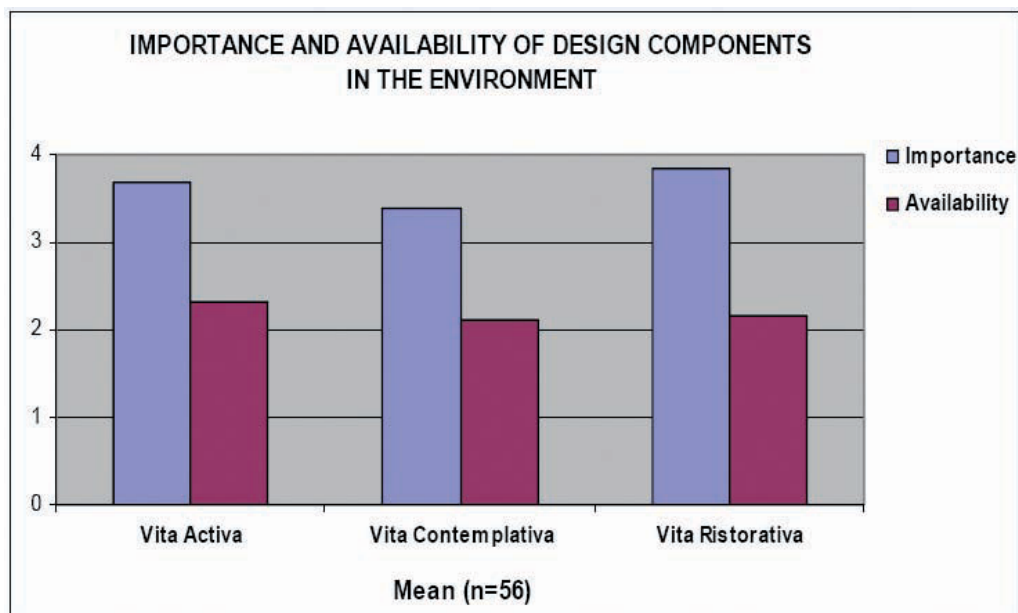


Figure 7 Importance and availability of Vita Activa, Vita Contemplativa and Vita Ristorativa in the physical environment from an employee perspective, illustrated in mean.

In the Vision Phase critical thoughts focusing on difficulties and obstacles must be replaced by thoughts of new possibilities and opportunities. The participants are encouraged to imagine situations with endless resources. In this phase it is wise to try and imagine the new spaces to understand what is optimal in the environment and what meets the needs of the organization. At the same time it is also important to note environmental factors affecting emotions and experiences in a positive way. Just like in the Critique Phase, the methods of brain storming and group discussions are used to describe and set concrete the visions. The results of the top-ten list in the Vision Phase are listed below:

1. An inviting entrance	115 p
2. The apartments	73 p
3. An activity centre	72 p
4. The garden/backyard	53 p
5. Space, daylight, windows, lighting	41 p
6. Spacious bathrooms	40 p
7. View	31 p
8. Colors and patterns	28 p
9. A central kitchen for the entire facility	25 p
10. One level building	25 p

The purpose of the Implementation Phase is to unite the critique and the visions creating tangible suggestions and action plans. The objective is to realize the visions and to have an agreement in the entire group. Each group presents their plans in front of the large group. The various suggestions are challenged, questioned and commented on by anyone who wishes to do so. This is a way of testing the strength of each plan. A number of themes emerged, themes that later were complemented and concretized. The work continued with in depth discussions and later presentation of proposals and plans after a consensus regarding the most important subjects was made.

The presentations received views, criticism and questions from the other group members. Three areas were chosen for in-depth discussions; 1)

an inviting entrance/the courtyard, 2) the units/apartments/bathrooms and 3) an activity center. The groups created lists of concrete and detailed recommendations for each of these design components.

The Questionnaire

The first part of the questionnaire contained the Sense of Coherence Scale originated and developed by Antonovsky in 1991. The original version contained 29 questions and measured the three elements; comprehension, manageability and meaning as a whole. A shortened version of the questionnaire was also constructed by Antonovsky containing 13 questions taken from the larger survey and used in this study.

The Health Index Scale used in the second part of the questionnaire measures general experienced health and includes nine questions regarding the following health factors; energy, mood, tiredness, loneliness, sleep, dizziness, digestion, pain and mobility. Two additional questions measured current health status and general health status. The last question in this section of the questionnaire was semi-structured and concerned the occurrence of any currently experienced health symptoms. Each question was responded to on a four graded "Liker scale" where higher points reflect a higher rating of health for each aspect. The third and final section of the questionnaire was constructed and designed by the authors. This section focused on the experienced physical working environment of health care staff as well as the physical and psychosocial living environment of the elderly.

The emphasis was on the health promotional aspects of design components earlier identified in the reference group. In total, part three contains 21 questions, two of which are semi-structured with options for motivating the experiences of the environment. One open question completes part three and offers a chance to freely express, comment, and suggests anything related to the subject matter.

Results

The number of completed questionnaires were 58 which is a response frequency of 44,6 percent. A total of 92,9 percent were filled in by women and 7,01 percent by men. The internal response frequency on individual questions was generally over 84,4 percent.

The short version of the Sense of Coherence Scale was used in the first part of the questionnaire with the purpose of measuring self rated general resistance maintaining health using Antonovskys' salutogenic model. A high score on the test indicates a strong sense of coherence. The result reflected that the employees on average rated their sense of coherence as somewhat higher than average ($m=5, 29$). The distribution of the three concepts included in the theory

were; comprehensibility ($m=5, 21$), manageability ($m=5, 39$) and meaning ($m=5, 27$). Internal consistency was tested using Cronbach's alpha and indicated good reliability ($\alpha=, 82$).

The second part of the questionnaire measured employee self rated health using Health Index. High scores reflect experienced good health. By adding all eleven health factors, a general indication of the health status was determined ($m=3,19$) on a four graded score (1-4). The results reflected experienced health symptoms with the lowest score for fatigue ($m=2, 67, SD=0,64$) and with the highest score for mobility ($m=3,65, SD=0,64$). A number of correlations were identified. Current health status and general health status correlated significantly and positively ($p<0,01$). High scores on current health status



Figure 8 *Inviting entrance in two levels*

also indicated high rated general health status. The general health status also correlated significantly to sleep and pain ($p < 0,01$). Low scores for sleep and pain indicated low rated general health status. Individuals who experienced poor sleep and experienced more pain symptoms also rated their general health lower. The last question concerned current health problems or disorders. A total of 38,6 percent of respondents stated that they did experience current health problems. The most common type of symptoms was pain in the back and shoulders followed by difficulties concerning sleeping/fatigue. The third most frequent symptom reported was high blood pressure.

The results regarding the importance of the three health promotion concepts in elderly care, Vita Activa, Vita Contemplativa and Vita Ristorativa indicated that employees valued all of the concepts as somewhat important or very important on a four graded scale (1-4). The average scores were for Vita Activa, ($m=3,67$, $SD=0,47$) for Vita Contemplativa, ($m=3,38$, $SD=0,77$) and for Vita Ristorativa, ($m=3,84$, $SD=0,37$). When all six components constituting each concept were added, the results pointed to a discrepancy between the rated importance of each concept and the available conditions for the same concepts (Vita Activa, Vita Contemplativa och Vita Ristorativa). The discrepancy was particularly evident and most significant for Vita Ristorativa. Its qualities were rated very important and the availability of these qualities was at the same time rated the lowest of the three concepts.

Overall satisfaction among employees in the physical work environment ($n=56$) was rated on average as somewhat good ($m=2,84$, $SD=0,63$). The questions regarding elderly overall satisfaction with the physical living environment from an employees perspective ($n=56$) yielded on average as somewhat poor ($m=2,16$, $SD=0,71$). The reasons stated for overall satisfaction with the physical living environment were compiled and categorized illustrated below:

Satisfaction in the Physical Living Environment	n=	%
Requesting private rooms not shared wards	6	25
Corridors are experienced as a negative design component	5	21
A homelike environment is preferred rather than the experienced hospital like environment	5	21
Personal integrity is limited in existing setting and must be promoted	4	16,5
The physical environment is generally experienced as being too dark	4	16,5

Figure 8

Elderly overall psychosocial satisfaction in the nursing home from employee perspectives ($n=54$) resulted in an average of somewhat poor ($m=2,04$, $SD=0,8$). The motivations to these answers were compiled. In total, 23 persons filled in their motivations which is a response frequency of 40,4 percent. The motivations are illustrated below.

Satisfaction with the Psychosocial Living Environment	n=	%
More activities and stimulation is suggested	8	35
Smaller units are needed to create a more personal atmosphere	6	26
Compromised integrity leads to feelings of fear and insecurity	5	22
Categories of elderly are mixed too much within each unit causing anxiety	4	17

Figure 9

Implications

Comprehensive knowledge of how the elderly experience their surroundings is a requirement in planning the design of a new elderly care facility. These care homes make up the dwellings during their last stages of life. It is therefore necessary to have an understanding and aware-

ness of the natural functional losses specific to ageing. Residents in elderly care facilities have the right to feel safe and should be supported and encouraged to live as independently as possible in their environment.

Research regarding the planning and design of elderly care facilities are unusual in Swedish universities today. Sweden has not invested in research and development based on evaluation in spite of large investments made yearly for the construction and renovation of health care buildings. A logical consequence in this context is to view this report as a contribution to staff involvement in the planning of their future work environment. This is motivated by relevant experiences of functional and appropriate spaces among health care professionals. This active participation also contributes to the development of new knowledge and services within elderly care.

The combination of workshops and questionnaire applied in this report is a unique process of making often concealed resources of health care employee knowledge visible. This use of competence must be developed and applied in future work. It is suggested to consider this activity as a production and application of knowledge.

The elderly is not a homogenous group but may be divided into separate categories such as, the elderly with dementia, the elderly with Parkinson's disorder and the elderly with natural functional loss due to the aging process. All these groups and each elderly individual within a group has varying needs regarding the physical environment. The needs and requirements must be analyzed on different levels throughout the building structure and the design levels.

It is the task of architects and designers to unite and interpret translate and shape these criteria in the physical environment in order to satisfy complex and sometimes contradictory requirements from staff and residents.

Evaluations must be developed in accordance with residents' needs and requirements with the sole purpose of contributing to professional competence in elderly care. This could be utilized in an ongoing process to eliminate poor design solution. Continuous evaluations will also guide the organizational decision making processes. New operational strategies, services and environments must be developed concurrently in response to all user' needs for changes in future elderly care.

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