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Health promoting qualities in outdoor environments at residential care facilities for older adults – a research approach

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Abstract: The present research project focus on health and building design parameters for the development of outdoor environments at residential care facilities (RCF) for older adults. An objective of the project is to develop an evidence-based guideline and method for design, planning and evaluation. The starting point for the project is that outdoor environments at RCF often are difficult to reach from the indoor environment and not adapted for outdoor rehabilitation and outdoor stays. Most often, rehabilitation activities for older persons at RCF are performed indoors and older persons at RCF do not have the legal right to daily outdoor stays. Pending a development of outdoor rehabilitation as well as changes in the regulations regarding access to daily outdoor stays, it is important to examine health promoting qualities in the outdoor environment. It is also important to focus on the older adult's possibilities to move between indoor and outdoor environments to reduce the risk of feeling locked in. The present paper describes and discusses a mixed method approach that builds up the five sub-studies in the project.

Keywords: health-promoting; older adults; outdoor environment; residential care facilities; working method for design, planning and evaluation

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1. Introduction

United Nations sustainability Goal 11: 7 emphasizes the importance of enabling public access to: "green and public spaces, in particular for [...] older adults and persons with disabilities". This means that all persons should have the possibility to live and participate in societies on equal conditions, both in indoor and outdoor environments and regardless of functional capacity. However, this is not the general situation today, for example at residential care facilities (RCF) for older persons in Sweden. An improvement of accessibility to the outdoor environment at RCF is therefore a need to consider in planning, design, and evaluation. In Sweden there are approx. 2 100 RCF and about 88 000 older adults are living in this type of housing. About half of the older adults at RCF experience a decline of their functional capacity in terms of extensive mobility difficulties on their own (The Swedish National Board of Health and Welfare, 2019, in Swedish) for example between indoor and outdoor environments.

Before focusing the importance of being outdoor for older adults, three main concepts have to be considered and understood. The first concept is *health*. To understand what health is in this context, we use the WHO definition: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 1948). The second concept is *health promotion*, which is defined as: "The process of enabling people to increase control over and improve their

health” (World Health Organization, 1986). The third concept is *outdoor environment*, and, in this context, it relates both to the physical environment that is directly adjacent to the RCF buildings/facilities and to the physical environment in the neighborhood. All three concepts contribute with perspectives that are fundamental for this research project.

Why is it important to have access to an outdoor environment? Contact with nature supports healing and contributes to an improved experience of health (Bengtsson, 2015). Being outdoors in a health-promoting environment has the greatest health effect for fragile and vulnerable persons, but in general it is important to have the possibility to choose where you want to be, for example the possibility to be outdoors as an alternative to indoors (Bengtsson 2015). Another significant aspect is that outdoor environments at RCF are often difficult to reach from the indoor environment, which can lead to a risk of the older persons being and feeling confined, which can have negative influences on health (Dahlqvist et al., 2019). This calls for a need to develop our understanding of the outdoor environment and its potential for health and wellbeing at RCF. Older adults at RCF are often frail which means they have a variation in needs, conditions, and functional ability (Nordin et al., 2017). Fall injuries are common cause of injury to older adults and the consequences are often serious and require rehabilitation (Gell & Patel, 2019). At present, rehabilitation for older adults at RCF is mainly carried out indoors, where a development in the field advocates the introduction of outdoor rehabilitation. Research emphasizes the importance of outdoor environments for rehabilitation and that we need to offer varied environments that suit people's different needs (Palsdottir et al, 2018). The design of the physical environment can constitute enabling or hindering factors for both outdoor rehabilitation and outdoor stays (Calkins, 2018; Nordin et al., 2017). In Sweden, outdoor rehabilitation is already a treatment recommended for persons with stress-related mental illness (Vårdguiden, 2022 in Swedish), which makes it interesting to introduce also for frail older adults with physical disabilities.

Today, the importance of the physical environment for health and well-being is high on the agenda nationally and internationally (Centre for Healthcare Architecture, 2021, in Swedish), this also applies to the environment at RCF (Bengtsson, 2015; Joseph et al., 2016; Nordin et al., 2017). Persons whose various disabilities and diagnoses result in special needs in the health care environment are becoming increasingly important and prominent, in relation to health and behavior, when designing health care environments (Patrick, 1997). Research focusing environments and its impact on health is developing and growing and there are increased demands on evidence-based design for healthcare facilities (Bengtsson 2015; Iwarsson 2012; Nordin 2015). With an aging population, the need for RCF increases. It is therefore important with environments that meet the older adults needs and functional abilities. Based on this background, quality assurance and development of the outdoor environment at RCF are aspects that needs to be studied.

The overall aim of the ongoing research project presented in this paper, is to describe and discuss the four-year project focusing health-promoting qualities in outdoor environments at RCF for older adults. The intention is to develop an evidence-based guideline as well as a method to support design, planning and evaluation. The overall methodology for the research project is mixed methods. The project duration is 2021-2025 and at the time of writing, data collection for sub-study I and II is ongoing.

The paper starts with presenting the theories and models on which the project is based. After that, some knowledge gaps are defined. Then follows a discussion concerning the overall design of the research project and the potential of the included sub-studies to address the identified gaps.

2. Theories and Models

The project takes its starting point in *Lawton's theory on ecological model of aging* (1983) and the principal model of *four zones of contact with the outdoors* (Bengtsson 2015). Lawton's theory originates from gerontological science, and includes the importance of balancing the demands of the care environments in relation to people's functional competence. It describes a person's behavior and how it can be understood as a product of competence (intellectual, emotional, and practical ability) and the environment demands (physical environment and psychosocial climate). The theory implies that persons with high competence more often will behave in a way that is adequate for the situation, compared to those with lower competence. The theory also highlight that both too high and low demands from the environment can have negative impact on the individual. The principal model of *four zones of contact with the outdoors* is developed within the environmental psychology discipline by Bengtsson (2015). The model identifies four essential zones to study the potential of the outdoors to the users with a holistic approach to

the physical environment (Bengtsson, 2015). Zone 1 consists of the contact with the outdoor environment from inside the building (through windows), zone 2 consists of the transition between indoors and outdoors (entrances, balconies, or conservatories), zone 3 consists of the outdoor environment (garden) that belongs to the building and zone 4 consists of the surrounding outdoor environment in the community (Bengtsson, 2015) (figure 1). (Zone 0 represents the indoor environment without contact with the outside world). A body position concept has been integrated with the principal model of four zones of contact with the outdoors (Bengtsson et al 2018, in Swedish). Four different body positions are identified: 1.) lying position, 2.) sitting position, 3.) standing position and 4.) in motion (in a wheelchair or walking with or without support from another person or aid (Figure 1).

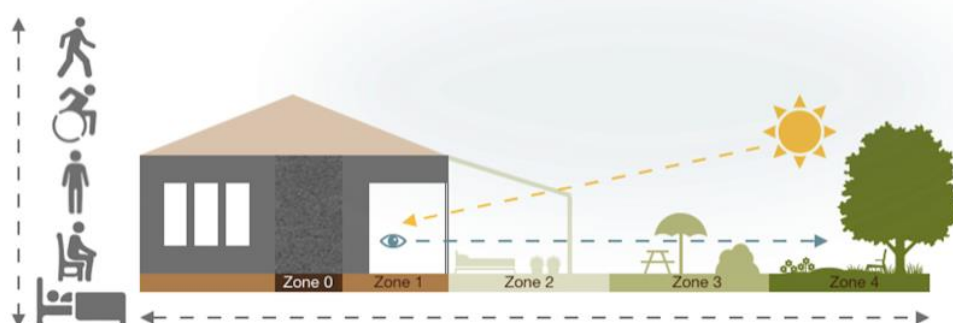


Figure 1: Four zones of contact with outdoor environment in relation to body position. Illustration: Anna Bengtsson and Madeleine Liljegren.

Knowledge gaps

The overall knowledge gaps identified concerns health-promoting qualities in the outdoor environment in relation to older adults living at RCF. More specifically the gaps concerns:

- Knowledge concerning older adults' access to outdoor environments at RCF (sub-study I).
- Knowledge of the needs and wishes of the older adults and staff in contact with the outdoor environment at RCF (sub-study II).
- A guideline that clarifies health-promoting qualities in the outdoor environment that should be prioritized when planning, designing and evaluating the outdoor environment at RCF (sub-study III).
- A working method that includes health-promoting outdoor qualities in design, planning and evaluation of new production or rebuilding of RCF (sub-study IV).
- A strategical model at national level to ensure the possibility for outdoor stays and outdoor rehabilitation for older adults at RCF in Sweden (sub-study V).

Each identified knowledge gap leads to a research question for each sub-study in the research project, which will be described and discussed in the following section.

3. Discussion

We will here describe and discuss the study design developed in relation to the overall aim of the study, namely, to increase knowledge of health promoting qualities in outdoor environments at RCF for older adults, and we will describe and discuss one sub-study for each specific research question.

The overall study design

The overall methodology for the research project is mixed methods, which means that different methods (quantitative and qualitative) are combined (Sandelowski 2014). The project comprises five sub-studies, and due to the complexity of the overall research question, different methods are used to achieve the purpose. The first sub-study is quantitative, and the other ones are qualitative. All five sub-studies relate to and build on each other. In the first sub-study a national survey concerning access to outdoor environments at RCF is conducted. The second sub-study builds upon on interviews with older adults and staff at RCF, focusing their needs and wishes in contact with the outdoor environment. The result from sub-study I and II, together with a literature review and design tools for

RCF, will in sub-study III support the development of an evidence-based guideline for design, planning and evaluation of RCF. In sub-study IV the guideline will be further developed and integrated with standard working methods for design, planning and evaluation of RCF. Finally, in sub-study V, a strategical model at national level will be developed to ensure the possibility for outdoor stays and outdoor rehabilitation for older adults at RCF in Sweden.

To increase the knowledge of health promoting qualities in outdoor environments at RCF for older adults, it is important to gather data from different perspectives and target groups. Planned target groups are: older adults, staff and business managers at RCF and professional groups and experts who are involved in various ways in the design and planning. The research project consists of five sub-studies, one for each research question.

Sub-study I: What access do older adults at RCF in Sweden have to outdoor environments?

Today, we do not know how many RCFs in Sweden that have their own outdoor environment, even less about the other zones according to the model developed by Bengtsson (2015). The sub-study aims to investigate access to outdoor environments at a national level. Theoretically, this sub-study relates to the model of the four zones of contact with the outdoors (Bengtsson, 2015). The idea is to analyze site layouts of the outdoor environments and drawings of each floor in the building to gain knowledge of access to outdoors, balconies and roof terraces at each special residence in Sweden (about 2100 RCF). The result will be presented in diagrams and illustrations. On an overall level, the target group is older adults who live at RCF. Indirectly, each municipality's building permit unit is the target group for data collection. Data is collected through the procedure: 1.) The National Board of Health and Welfare provides a list of all RCF in Sweden, categorized by municipality and 2.) All municipalities' building permit units (n=290) are contacted via e-mail and asked to provide drawings of each resident's outdoor environment and floor plans. The data is analyzed based on the four zones of contact with the outdoors (Bengtsson, 2015). In addition, the various municipalities are categorized based on Sweden's Municipalities and Regions' municipal group division. All RCF for older adults in Sweden regardless of type of operation (municipality, private or foundation) are included.

Sub-study II: What are the needs and wishes of older adults and staff concerning outdoor environment at RCF?

Theoretically, this sub-study relates to Lawton's theory on ecological model of aging (1983), while we will investigate needs and wishes and connect them to facilitating and hindering factors in the environment. The sub-study also relates to previous research about older adults and physical indoor and outdoor environments at RCF (Nordin et al., 2017). The aim is to map needs and wishes of older adults and staff in contact with the outdoor environment at RCF. The method is a qualitative semi-structured interview study (Polit & Beck 2021) carried out in the form of walking interviews (King & Woodroffe 2017). Themes that are central to the interviews are facilitating and hindering factors in the environment in the four zones. Participants in sub-study II are older adults and staff at RCF. Data is collected through a strategic selection of three RCF within one Swedish region. Interviews are conducted with older adults (4 per RCF) and staff (5 per RCF). Data is analyzed based on qualitative content analysis (Lindgren, Lundman, Graneheim 2020).

Sub-study III: Which qualities in outdoor environments for older adults at RCF are health promoting and should be prioritized?

Theoretically, this sub-study also relates to the model of the four zones of contact with the outdoors (Bengtsson, 2015), previous research about RCF (Nordin et al., 2017; 2015) and availability in outdoor environments (Iwarsson et al., 2012). The aim is to develop a guideline regarding qualities in outdoor environments at RCF. The method is guideline development, ensured via the Delphi method (Keeney, Hasson & McKenna 2011). Participants in sub-study III are experts in the field; researchers as well as practitioners. By combining evidence from previous research (systematic literature review and validated and reliable instruments) and the current project's sub-studies I-II, data is obtained (see e.g. Armijo-Olivo et al 2010; Moher et al 2009; NCCMT NCCfMaT 2011). Data is analyzed based on qualitative content analysis (Lindgren, Lundman, Graneheim 2020).

Sub-study IV: How can health-promoting qualities in the outdoor environment be integrated into the standard working method for design, planning and evaluation of new production or rebuilding of RCF (sub-study IV).

Theoretically, this sub-study relates to the same model and research as in sub-study III, and it also relates to research about design dialogues (Fröst, 2020). The aim is to further develop the guideline (from sub-study III) so that it can be integrated into standard working methods for the design, planning and evaluation of outdoor environments at RCF. The approach is method development through design dialogue (Fröst, 2020). Participants in sub-study IV are representatives from the health care sector and the building sector working with new construction or refurbishment of RCF. The design dialogue focus where and how environmental qualities from the guideline should be integrated in the standard working methods for the design, planning and evaluation of outdoor environments at RCF. Different alternatives regarding when the environmental qualities are to be addressed needs to be studied to find out how they can become articulated in design and construction. The responsibility for where in the standard process and by whom the environmental qualities needs to be brought in also needs to be studied. Qualitative content analysis (Lindgren, Lundman, Graneheim 2020) is used to analyze the data.

Sub-study V: How can the possibility of outdoor stays and outdoor rehabilitation at RCF for the older adults be ensured at a national level?

Overall, this sub-study is an example of translational research at stage four, i.e. converting (or moving) results to community (Translational Science Spectrum, 2017). In sub-study V results from sub-studies I to IV is translated into a strategical model aiming at ensuring the possibility of outdoor stays and outdoor rehabilitation at RCF for older adults at a national level. The method includes dialogues about rules and guidelines, as well as method development, for environmental analysis in collaboration with relevant authorities. Target groups are representatives from two Swedish authorities (the National Board of Housing, Building and Planning and the National Board of Health and Welfare), the Swedish association for municipalities and regions, decisionmakers from municipal health-care organizations and representatives from the Swedish University of Agricultural Sciences' environmental analysis program for built environment.

Ethical considerations

As older adults living at RCF are in a position of dependence due to fragility and multimorbidity, ethical considerations are highly relevant to the project (The Swedish Authority for Privacy Protection, 2022; Swedish Ethical Review Authority, 2022, in Swedish; The World Medical Association, 2008). All participants, both older adults and staff, receive oral and written information about the study. They also receive information about why they are invited to participate, and they need to give their written consent to the participation. Participants also receive information about who they can contact or if they want to cancel the participation. Participation can have both positive and negative consequences for the older adults and staff. A positive consequence for the older adults is that they experience outdoor stays during the walking interviews, while a negative consequence might be an increased risk of fall accidents. Positive consequences for the staff are possibilities for outdoor stays and an increased knowledge of the importance of the outdoor environment for older adults. A negative consequence may be lack of time. Personal data will be treated confidentially in accordance with the Helsinki Declaration on Ethics (The World Medical Association, 2008). Data from the sub-studies will be presented on group level and in relation to the four zones. Quotes will be anonymous. The project has received an approved ethics application from the Swedish Ethics Review Authority (number).

4. Conclusions

RCF for older adults with disabilities are important facilities in every well-functioning sustainable society. To increase health-promoting outdoor environments at RCF, this research project aims to fill knowledge gaps in the interdisciplinary field of health care environments which include the research disciplines caring sciences and architecture. Five sub-studies are described and discussed to increase knowledge about health-promoting qualities in outdoor environments and ways of addressing this at RCF for older adults. To conclude, this research project intends to increase the knowledge concerning:

- I. Access to outdoor environments for older adults at RCF.

- II. Older adults and staffs needs and wishes concerning the outdoor environment at RCF.
- III. A guideline for health-promoting qualities in outdoor environments at RCF.
- IV. A working method that includes health-promoting outdoor qualities in design, planning and evaluation of new production or rebuilding of RCF
- V. Strategical models to ensure the possibility of outdoor stays and rehabilitation in health-promoting outdoor environments.

Data Availability Statement

The original contributions presented in the study are included in the article. Further inquiries can be directed to the corresponding author.

Contributor statement

The corresponding author conceived the idea for the manuscript. All authors contributed to the writing and development of the manuscript's ideas and read, and approved the final manuscript.

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