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RIGA STRADIŅŠ UNIVERSITY

Signe Tomsone

ASPECTS OF HOME AND HEALTHY AGEING AMONG VERY OLD EUROPEANS: A LATVIAN PERSPECTIVE

Summary of Doctorate thesis

(Speciality – rehabilitology)

Supervisor: professor Jānis Zaļkalns

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Actuality of the study

Considering the global population ageing process with increasing proportions of old and very old people, it is very important to understand and increase our knowledge on ways to support healthy ageing. The components of good health are related to e.g. social and economic factors, physical activities, psychosocial support and societal services such as medical care. With the continuing growth of elderly population in modern societies, it has become a matter of increasing urgency to look for ways to maintain and improve the functional abilities of ageing people, to help them cope independently in the community and ultimately, to raise the quality of their lives.

Since the thirties of the 20th century, Latvia has been one of the demographically old states and nations. The ageing process continues after Second World War because the low birth rate and partly growth of life expectancy when bigger part of population achieve age of 60 and 70 years and also different thresholds of ageing as well as migration (almost younger people emigrate) facilitate this process (Zvidriņš P.,1998). Based on Eurostat data in 2005, 16.5% of Latvian population were over 65 yrs and 3% of them were older than 80 yrs (Eurostat yearbook, 2006- 07) and prognosis is that this part of population will grow till 21.4% in 2031 and 26.5% in 2051 (Zvidriņš P., 2006).

Latvia has one of the lowest life expectancy (LE) rates in Europe. There is tendency slightly improve this rates – in 2004 the women had 77.4 yrs but men- 67.4 yrs (CSP, 2006). Comparing with the EC data this is about 8 years less for men and 4 years less for woman. In addition to LE, it is increasingly important to know the expected length of life spent in good health. WHO uses healthy life expectancy (HALE) indicator for this purpose, subtracting estimated years of life spent with illness and disability from estimated LE. For Latvia it is estimated that people can expect to be healthy for about 89% of their lives. They lose an average of 7.5 years to illness expressed by difference between LE and HALE. This loss is quite similar to the Eur_A average (7.3 yrs) and the Eur B+C average (7.6 yrs) (WHO, 2005).

Ageing is the natural progressive decrease of organism functional abilities and increase of natural reasons of death in relation to the chronological age of person. Ageing could be viewed from different perspectives: chronologicaly, biologicaly,

psychologicaly and socialy. Older people constitute a very heterogeneous group with different capabilities. Consequently, several researchers have emphasized the importance of separation the youngest old from the oldest old (Haak M, 2006). There are different types of division principles into age groups, but in the literature often people in the age group 65- 75 years are called "younger old", those in the age group 75- 85 years "mid-old", and people aged 85 years or more as "very old". Baltes and Smith (2001) suggested an alternative approach to differentiation, namely the Third age and the Fourth age. One of their definitions is a transition from the Third to the Fourth age when 50% of the birth cohort is no longer alive (in Western countries usually around 80- 85 years). Their differentiation emphasizes a highly individualized ageing process based on functional characteristics, thus not strictly connected to chronological age. Third age represents rather good physical and mental function, a high level of emotional and personal well-being and efficient strategies for gains and losses in later life, whereas the Fourth age represents considerably cognitive losses and a high level of frailty (Haak M, 2006).

During past years several international organizations have worked on policy frameworks and recommendations based on this perspective and the terms healthy ageing or active ageing have become part of everyday language of health care professionals. Active Ageing- Policy Framework (WHO, 2002) define *active ageing* as "the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age". This policy framework takes into account the determinants of active ageing: the culture and gender aspects, determinants related to health and social services system, related to personal factors and determinants related to the physical as well as social environments. The framework helps to shape the ageing policies at regional and national levels and to direct research on ageing as well as influence the practical application of policies at community level.

Research on ageing traditionally has been concerned with health but recently the concept of functional health has growing attention (WHO, 1998). In the medical literature, the terms function and functional performance are often used to describe the ability of an individual to carry out various tasks of daily living. Measures based on indicators of functional ability, such as personal activities of daily living (P-ADL) and instrumental activities of daily living (I-ADL) scores, are widely used both as

indicators of the functional health of elderly populations and population subgroups, and in clinical assessments (Tallis R.C., Fillit H.M., 2003).

Historically, occupational therapists focus on a client's ability to perform daily tasks that are important to the individual (CAOT, 1995), activities and participation. In occupational therapy everyday activities that are valued and meaningful to individuals or culture recently are defined as occupations: specifically self-care, productivity and leisure. Occupational therapists view function as the dynamic transactional relationship of persons, occupations and environments, and assumes an inseparability of contexts, temporal factors, and physical and psychological phenomena and label this relationship *occupational performance* (Christiansen C. & Baum C., 1997). Functional limitations, within Disablement Model (Verbruge & Jette, 1994) which serves as frame of reference for research in the epidemiology of ageing and disability, are defined as restrictions or difficulty in the performance of generic tasks but disability refers to the inability to perform specific social roles in everyday life because of health or physical problems. Currently the International Classification of Functioning, Disability and Health (ICF) is health model which recognise the importance of factors other than abilities and skills and identifies environmental and social dimensions as important ways to categorize what people do (WHO, 2002). It is important to note that the ICF is about all people, not only persons with disabilities. The ICF considers that the different elements within the classification can interact to a lesser or greater degree, rather than having causal or hierarchical effect (Figure 1.).

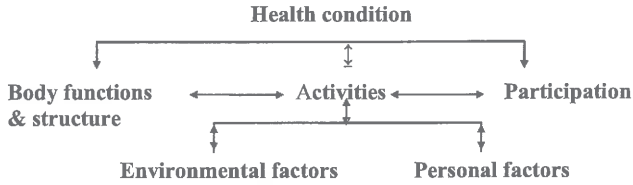

Figure 1. Interaction of ICF concepts (WHO, 2002).

The components of the ICF can be described in a positive or negative way and functioning is umbrella term to describe the positive aspects of all mentioned components. The environmental factors can be described in terms of potential facilitators or barriers for the person's activity or participation (McIntyre A.& Atwal

A., 2005). As the ICF considers not just the person and the disease but also the environmental context in which people live, it fits easily with occupational therapy thinking of the person- environment- occupation interaction described in models of occupational performance (Law M. et al, 1997).

The environmental impact on ageing is the research focus within environmental gerontology (Wahl H- W., Weisman G. D., 2003). Historically, the most important model to describe the person- environment (P- E) interaction is the Ecological Model of Ageing (Lawton& Nahemow, 1973), including the docility hypothesis (Lawton& Simon, 1968, Scheidt& Norris- Baker, 2004). In this model the person is defined in terms of a set of competencies and the environment is defined on the basis of its demands, named environmental press. Competence is defined globally by relatively stable capacities of biological health, sensory and motor skills and cognitive functions that could exhibit marked changes in varying trajectories of illness and health. The capacities possess a functional value for the individual when dealing with demands posed by tasks of everyday life. Environmental press as well as competencies may fluctuate over time and the successful interplay between those components results in an „adaptation level".

The most important for old people is the home environment and neighbourhood, which may affect participation in everyday life and independence, as confirmed by several studies in Sweden (Lilja M., 2000; Haak M., 2006; Haggblom Kronlof G., 2007). According to Rowles (1991) the home environment is more than the physical and social setting, it may be seen as "a component of self", a part of a person's life linked to self- identity. The perception of meaning of home may change as elderly persons experience increased frailty or disabilities. An increased dependency on others could lead to a feeling of loss of control and hereby threaten the feeling of home as a place of security and identity. An important goal in health promotion is to create environments supporting healthy living and subjective well-being. Following a line of thought proceeding from the fact that independence in ADL is an important health indicator, a physical home environment supporting daily activity independence is most likely health promotive (Iwarsson S, 2003). Based on the Ecological Model of Ageing there is reason to assume that the relation between housing and health should be particularly strong in later life because of the increased vulnerability of older adults to environmental challenges (Oswald F. & Wahl H-W, 2004).

There is incomplete data on health and factors influencing the welbeing of persons older than 65 in Latvia as well as limited information on research in this area. Available information speaks that there is number of single living old people who not receive the support of relatives and availability of health and social care services, provided by state and community, is quite limited (Sabiedrības veselības stratēģija, 2001).

The National plan for Latvia development (LR Reģionālās attīstības un pašvaldību lietu ministrija, Rīga, 2006) state that necessary to create preconditions of good health during life course, popularize and develop prevention, to create public opinion that health is value and improve health care system. As many factors (biological, social, economical, environmental and habitual) influence health, the process of increasing well-being of population is complicated. To achieve such general goals for elderly, the research, focused on old people perception of wellbeing, aspects of ageing and factors affecting this process, is needed. There is knowledge and experience worldwide but the specific knowledge in Latvia can provide an evidence base for the development of social policy as well as health and social care practice in local context. In Latvia there were no studies on home environment- the meaning and impact on everyday activities performance among old people, but it would be necessary in light of changes in social care policy which tend to support the stay of old people at home as long as possible.

Aim

The overall aim of this project was to explore the everyday activity performance aspects (focus on housing), in order to come up with recommendations for development of health promotion, rehabilitation strategies and planning more efficient services supporting health among very old people living in ordinary housing in the Latvia.

Study objectives

- To deepen knowledge on meaning of everyday activities performance among very old people living in ordinary housing in Latvia;
- To explore patterns of relationships between aspects of housing and healthy ageing in very old age and explore whether or not comparable

relationships between housing and healthy ageing do exist in five European sub-samples (Sweden, Germany, the UK, Hungary, Latvia);

- To investigate whether and how objective and perceived aspects of housing are related to perceived health among very old single-living people with different levels of dependence in activities of daily living (ADL) in three European sub-samples (Sweden, Germany and Latvia).

Novelty of study

- Health care professionals in Latvia understand the functional abilities of person using the medical terminology, with accent on body structure and body functions. Within my thesis there is attempt to emphasize the everyday activities as interaction between health status, environmental factors and personal factors, which according to the concepts of WHO ICF (2002) about contexts have impact on healthy ageing and quality of life for elderly.
- Results of studies reveal new knowledge in Latvia on functional health status among very old people and their abilities to perform everyday tasks in ordinary housing environments, the most important difficulties they are experiencing and factors affecting the level of functioning.
- Studies support new knowledge to evaluate the functional abilities of elderly people in the home setting. This knowledge also facilitates awareness of society about healthy ageing and strategies to support it.

Implications to practice

- The changes in social policy in Latvia during last years tend to develop rehabilitation and care services in the community. There is experience in Latvia of functional evaluation in the clinical settings but to do such evaluation in individual's home environments is in the beginning. The methods used within studies are useful for health and social care practicioners to evaluate client's needs and effectivness of services.
- The results of this study are useful for health care practitioners working with old people in home settings because besides of traditional therapy

methods to improve persons functional abilities, there is also available technical aids and some adaptations of home environment.

Material and methods

The ENABLE-AGE Project

This thesis is based on data from the project "Enabling Autonomy, Participation, and Well-Being in Old Age: The Home Environment as a Determinant for Healthy Ageing" (ENABLE-AGE, 2002-2004, EC funded). The ENABLE-AGE Project was a cross-national, inter-disciplinary research project with the main aim to examine the home environment as a determinant for autonomy, participation and well-being among very old people living alone in the community in five European countries: Sweden, Germany, United Kingdom, Hungary and Latvia. Given the lack of knowledge in the research field targeted, the approach of the ENABLE-AGE Project was explicitly explorative. The project consisted of three different parts: the survey study, the in-depth study and the update review (www.enableage.arb.lu.se). The ENABLE- AGE Survey study was based on a comprehensive, project- specific questionnaire, administered at home visits with each participant by means of interview and observational assessments. The ENABLE-AGE national project team in Latvia included staff of the Academic School of Occupational Therapy, Riga Stradins University, and qualified occupational therapists.

The author of this thesis served as the national project leader, including active participation in the entire project process. That is, co-ordination of the sampling procedure, instrument translation and testing, organisation and co-ordination of the data collection process in all phases of the project, as well as overall project management including documentation and quality assurance of the entire process, participation in consortium meetings involving researchers from all the project partners. This thesis is based on three studies done in period from 2005 to 2008, presenting results from data analysis of the Latvian part of the ENABLE-AGE In-depth (Study 1) and from T1 of the ENABLE-AGE Survey (Stydy 2 and Study 3). An overview of the studies building up the thesis is presented in Table 1.

Table 1. Thesis overview.

	Sample	Data collection	Data analysis
Study 1	**N= 40** (Latvia)	In-depth interview, inspired by a Grounded Theory approach	Content analysis
Study 2	**N= 1918** (Sweden, Germany, the United Kingdom, Hungary, Latvia)	Structured interview questionnaire, including observational assessments: "The ENABLE-AGE Survey Study Questionnaire"	Descriptive statistics, F-tests, canonical correlations
Study 3	**N=1150** (Sweden, Germany, Latvia)	Structured interview questionnaire, including observational assessments: "The ENABLE-AGE Survey Study Questionnaire"	Descriptive statistics, Kruskal- Wallis test, Mann-Whitney test, χ^2- test, regression models

ENABLE-AGE Sampling procedure

Based on the explorative character of the project as well as challenges related to the possibilities to recruit participants in different national contexts, the ENABLE-AGE sampling strategy did not aim for national representativity. Sample aim was to include 400 veru old persons in every country- living single in own house, in defined urban area and considering the gender proportion (75% females and 25% males). Geographically, participants were located in urban regions- the central part of Latvia (Riga and Jurmala), in south-western Germany (Heidelberg and Mannheim), in Hungary (Budapest), in south Sweden (Halmstad, Helsingborg, Lund) and in the district of North West England of the United Kingdom (Wirral, located in Merseyside). Due to mean age and life expectancy differences between West/Central and East European countries, in Germany, Sweden and UK the participants were aged 80-89 years, while the corresponding age groups in Latvia and Hungary were 75-84 years (Table 2).

Table 2. Participants of ENABLE AGE project.

Age (at T1)	Gender	Sweden	Germany	United Kingdom	Hungary	Latvia	Total
75-79 years old	Women	—	—	—	145	176	378
	Men	—	—	—	36	21	
80-84 years old	Women	147	165	169	171	92	974
	Men	53	47	76	40	14	
85-89 years old	Women	149	188	94	—	—	566
	Men	48	50	37	—	—	
Total *N*(T1)		397	450	376	392	303	1918

The random sampling from official national registers was only possible in Germany, Hungary and Sweden. The sampling list, dropout questionnaire and interview plan was used for documentation of this process. The interviewers sent out information letters to the potential participants according to plan, followed-up by a phone call after 4-5 days with the purpose to make sure that the intended participant fulfilled the inclusion criteria, that the person had understood the information, and to ask whether the person consented to participate. If the person agreed, an appointment for the first home-visit was made. Data were collected by project-specifically trained interviewers at home visits in the participants' home.

ENABLE-AGE Sampling procedure in Latvia

The Latvian ENABLE-AGE Survey Study sample was recruited in the urban districts Riga and Jurmala. According to Latvian legislation on protection of personal data, it was impossible to receive random addresses from the Population register as originally planned. Substantial efforts were invested in finding alternative strategies for recruiting a valid sample. Thus, the sampling strategy was changed to create the sample indirectly by gathering the information of the target population through public organisations, pensioners' unions and social services. Contacts with municipalities and pensioners' unions in Riga and Jurmala were established. For example, rendering general dissemination effects as well, the Latvian team took part in the regular meetings of five different pensioners' unions to inform their members about the importance and procedures of the ENABLE-AGE Survey Study, striving for a positive influence on the willingness among them to enrol with the project. The sample generation process was gradual and ended with a list of 1,815 potential participants. Following the project specific sampling procedures, the final T1 sample in Latvia consisted of 303 respondents, 197 persons in the younger age-group (75-79 years) and 106 persons in the older (80-84 years) (Figure 2).

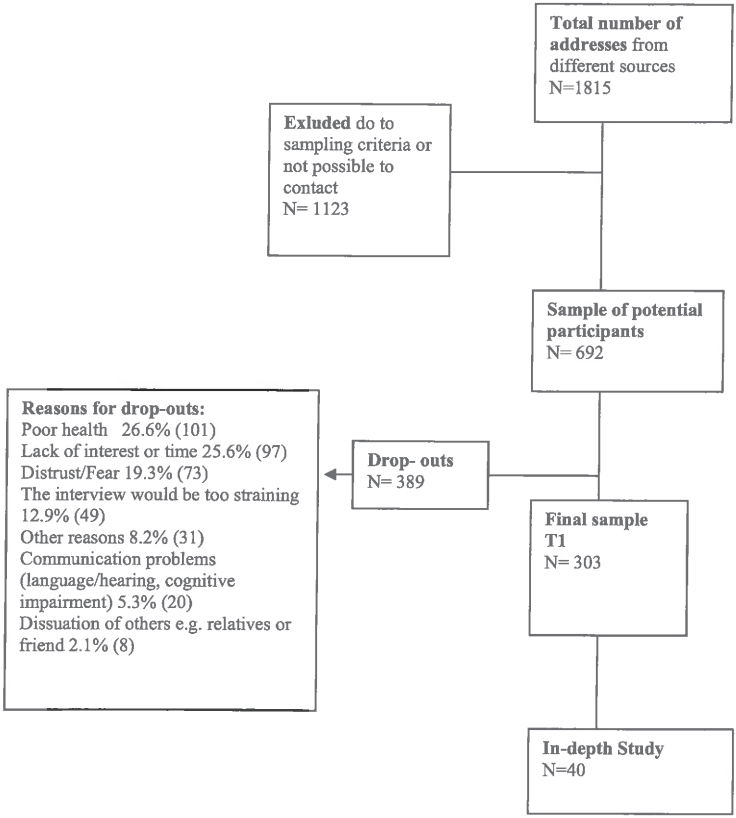

Figure 2. Description of the Latvian ENABLE-AGE sample generation, Survey Study T1 and In- depth Study.

ENABLE-AGE Sample description

In all, the sample comprised 1,918 very old adults; 75-89 years old (Table 3). Differences in finances (income and evaluation) existed among the five countries, with lower income in the Eastern compared to the Western sites, while differences in education were minor. Although there were differences in subjective health and duration of living, this nevertheless was a relatively frail sample of very old adults who on average had lived in their current homes over a long time period.

Table 3. Description of the ENABLE-AGE sample (all countries).

Variable	Sweden	Germany	UK	Hungary	Latvia
Number of participants (Total $N = 1918$)	397	450	376	392	303
Year of birth	1912–22	1912–22	1912–22	1917–27	1917–27
Age range (years)	80–89	80–89	80–89	75–84	75–84
Age (*M, SD*)	84.6 (3.1)	85.1 (3.2)	84.8 (2.7)	80.7 (2.9)	79.4 (2.6)
Gender (% women)	74.6	78.4	70.0	80.6	88.5
Education: years of schooling (*M, SD*)	8.8 (2.2)	11.6 (2.6)	9.9 (1.9)	9.7 (3.0)	11.3 (3.4)
Income/month in €(*M, SD*)[a]	1,015 (410)	1,569 (799)	1,044 (527)	216 (99)	100 (37)
Evaluation of financial resources (%, *n*):					
Low	34.4 (130)	17.4 (76)	23.4 (86)	56.5 (218)	87.9 (262)
Average	54.5 (206)	73.3 (321)	65.5 (241)	39.9 (154)	12.1 (36)
High	11.1 (42)	9.4 (41)	11.1 (41)	3.6 (14)	0.0 (0)
General perceived health (1–5)[b]	2.8 (1.1)	3.6 (0.8)	3.0 (1.0)	3.5 (1.0)	4.2 (0.7)
Number of diseases (0–44)[c]	4.9 (2.9)	5.3 (3.0)	4.2 (2.7)	6.1 (3.9)	7.9 (3.4)
Number of symptoms (0–30)[c]	7.3 (4.3)	8.0 (4.5)	8.1 (4.9)	10.7 (6.6)	13.8 (5.3)
Duration of living in same apartment or house: years (*M, SD*)	21.8 (17.4)	33.5 (19.4)	25.0 (18.3)	33.9 (19.2)	24.7 (16.6)

Notes: *SD* = standard deviation.

[a]In total, 269 participants (14%) refused to give information on income per month.

[b]Subjective evaluation; higher scores indicate lower subjective health.

[c]Higher scores indicate more reported diseases or symptoms.

ENABLE-AGE In- depth interview sample in Latvia

For the in-depth interviews the Latvian ENABLE-AGE Survey Study database was used for sampling in order to identify potential participants representing diversity. The interviews were carried out with 40 participants: 6 men and 16 women in age group from 75-79 years and 4 men and 14 women in age group from 80- 84 years. The sampling diversity criteria ensured that there was a range of participants from good to poor health, the functioning based on evaluation of independence in ADL varied from independent to dependent in most of ADL, living in a variety of housing conditions

and whose participation in social and community life varied from active to reclusive. In Latvia 7 participants rated their health as very good or good, while 33 participants rated it as fair or poor. 20 participants were independent in ADL, 16 participants were dependent in I-ADL, and 4 participants were dependent in both personal P-ADL and I-ADL. About 47.5% of the Latvian participants participated in social activities such as an organization or the like, while the other half did not. There was also variation among participants in terms of accessibility problems in their homes. All participants lived in ordinary housing; the majority of them lived in apartments, although the sample also included a few participants living in single-family houses. The period they had lived in their present housing ranged from 2 to 80 years (m= 26 y). Most of participants were Latvians but also included five Russian speaking participants, reflecting the ethnic diversity in the research district. Additional attention was paid to the inclusion of participants who came from economically varied backgrounds to ensure that both well-off and relatively poor older people were included.

Instruments

The comprehensive ENABLE-AGE Survey Study Questionnaire incorporated a wide range of well-proven self-report scales and observational formats along with project-specific questions on housing and health. Data, analysed in Study 2 and Study 3 of this thesis, comprises only part of the whole instrument set. Figure 5 presents an overview of them.

All instruments and questions were translated into five languages (English, Latvian, German, Hungarian and Swedish) while parts were translated also into Russian, due to the specific cultural situation in Latvia, followed by piloting in all countries. After completed training courses, pre-tests were administered where older people, not included in ENABLE-AGE sample, participated followed by necessary optimisation and revision of the ENABLE-AGE Survey Study Questionnaire. Finally, an inter-rater reliability study of the accessibility instrument was accomplished, based on a total of 64 pair-wise assessments. The results demonstrated moderate to good agreement across the research sites.

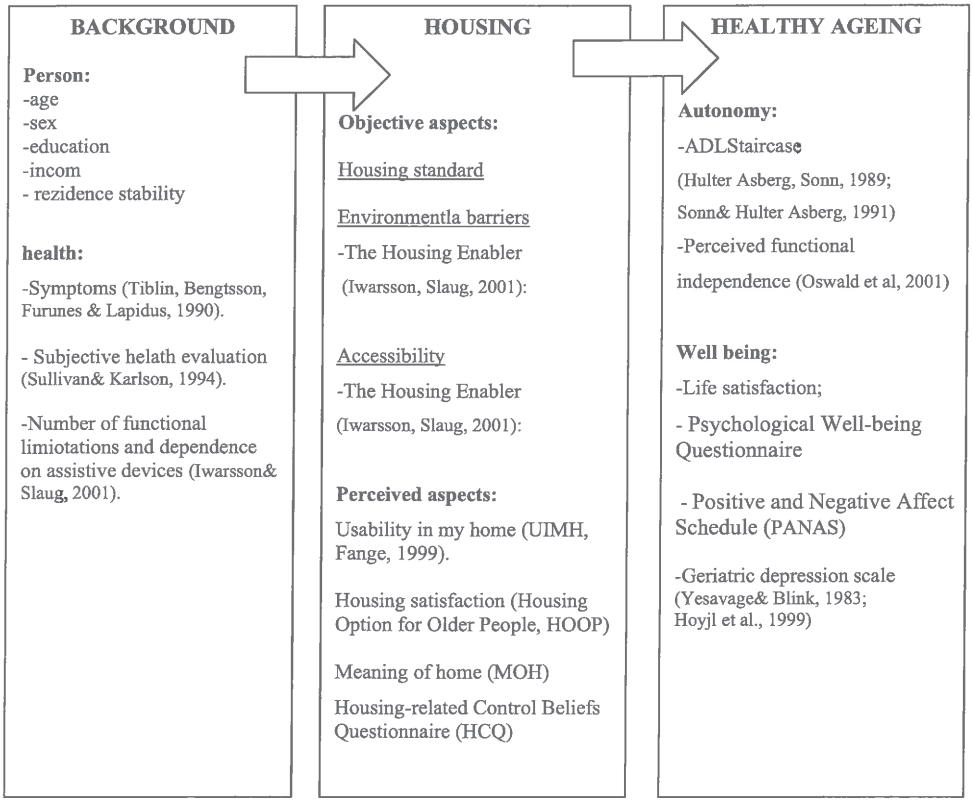

Figure 3. Overview of instruments for data collection and data for analysis within Studies 2 and 3.

The In-depth study design

Research focussed on ageing, housing/home, accessibility and usability, health, well-being, autonomy, participation (social and community), social networks/support and quality of life, as they were major key concepts for the ENABLE-AGE project. These concepts were investigated from the older person's perspectives; interviews were semi-structured using an interview schedule that acted as a guide to facilitate purposive discussion between researcher and participant. The interview schedule was amended as the data collection and ongoing analysis progressed.

Procedure

Data collection was accomplished at home visits. Regular team meetings were necessary to maintain the data quality, discuss problematic situations during the data collection and the author of thesis coordinate this work. In Latvia the data collection for the T1 survey started in November 2002 and was completed during May 2003. The duration of the T1 survey interview at home: visit 1 was between one and a half and two hours, and at home visit 2 one to one and a half hour. In 160 cases, where it was appropriate for the respondent, the data collectors carried out both T1 visits during one session.

ENABLE-AGE In- depth Study was specific because the five national teams varied in terms of their experience in qualitative research, disciplinary backgrounds and gender diversity. There were implemented a training programme for all teams, led by a senior scientist from the UK, experienced in qualitative research; to ensure that the qualitative research was conducted using the same principles in each country. There also were designed pilot study for the project and in Latvia it enabled the interviewers to gain experience of interviewing and to test the methodology, process, scope and content of research questions to be used in the main qualitative study. During the first ENABLE-AGE Survey (T1) data collection potential participants had signalled their interest and agreement to participate in the in-depth study. Interviews were performed during a one-year time period from July 2003 till July 2004. A team of five interviewers accomplished the interviews. The number of performed interviews varied among the team members.

All 40 interviews were taprecorded to ensure a good quality of the interview data. Interviews were between half of hour and two hours in duration and often a break was taken during the interview. Many participants said they had enjoyed the interview, some reported that it had made them think about some interesting aspects of their lives and they had learned something about themselves and/or their situation, others commented on their enjoyment in indulging in a stimulating or challenging discussion, as a rarity in their current lives. Researchers wrote in-depth field notes after each interview, structured by a field notes template. Field notes were used to document the researcher's interpretations of the background/context of the interview, the key points revealed in the interview in relation to research questions, initial ideas for analytical

themes and any relationships between themes, the general tone of the interview and a reflexive analysis.

The main data analysis was perfomed during ENABLE-AGE project.

Data analysis within doctoral thesis

Study 1

Everyday activities were not an explicit part of the ENABLE-AGE key concepts, but the first round of data analysis showed that participants mentioned the significance of activities and talked about them as medium to structure the day and as an indicator of health condition as well as for independence and well- being. In order to narrow the analysis the author of this thesis went into the data again and made a content analyse focusing on everyday activity performance.

Twenty interviews out of 40 were transcribed along the interview procedure and close to the interview occasion. The remaining 20 interviews were analysed by repetitive listening and detailed description. Data were synthesised through constant comparison.

Study 2

The differences between national samples in mean scores were tested by means of F-tests. To acknowledge the large sample, the level of statistical significance was set to $p < .001$.

In order to explore patterns of relationships between aspects of housing and healthy ageing canonical correlations were used, which is the most appropriate technique for exploring relationships among multivariate combinations of variables (Stevens J., 1996). Canonical correlations parsimoniously describe the number and nature of mutually independent relationships existing between two sets of variables which in this study was the housing variable set and the healthy ageing variable set (Table 4).

The analysis proceeded in a stepwise fashion as follows: First computed a pair of canonical variates such that the correlation between them is as large as possible. Next, calculated a second pair of canonical variates, orthogonal to the first, in the same fashion, and so on. The correlations between the pairs of canonical variates are called the canonical correlations (R). The procedure implies that the first R, extracted in the first step, is the largest; the second R is the second largest, and so on.

Table 4. Overwiev of variables included in data analysis.

Housing variable set	Healthy aging variable set
Environmental barriers	Independence in ADL
Accessibility	Perceived functional independence
Usability	Life satisfaction
Meaning of home	Environmental mastery
Housing-related external control	Depression
Housing satisfaction	Positive as well as negative affect

To interpret the findings, there was focus on the variable loadings. A high loading indicates that the variable is part of the relational pattern expressed by the canonical correlations. The loadings equal to or below the cutoff value of $r = .35$ were not considered for interpretation. In addition, the standardized canonical coefficients were reported.

The analysis was conducted for each research site separately. To check for similarity of the patterns of relationships found in the different national samples, Tucker's coefficient of congruence was used to compare the national samples' loading patterns. The coefficient of congruence is similar to a correlation coefficient, also ranging from –1 to 1; it was originally designed to compare patterns of factor loadings derived from different samples and is applicable to canonical loadings as well, level of significance were chosen $p<0.05$.

Study 3

For presenting the material, descriptive statistics were used. For each of the two ADL groups, differences between the three countries were tested by means of the Kruskal-Wallis test for all variables except for sex where a χ^2- test was used. Similarly, for the three countries differences between ADL groups were tested by the Mann-Whitney test except for sex where again a χ^2- test was used.

In order to establish the influence on perceived health from the variables describing objective and perceived housing aspects, regression models were used. As the outcome variable is a polytomous ordered categorical variable, we used ordinal regression analysis that is suited to handle outcome variables with several ordered categories (McCullagh P, Nelder JA, 1983); this regression method is an extension of logistic regression (Hosmer DW, Lemeshow S, 1989). For each of the ADL groups analysis started with univariate models in each of the three countries containing

perceived health and only one explanatory variable. Thereafter, for each ADL group separate multivariate regression models, studying the simultaneous influence of the objective and perceived aspects of housing were analyzed simultaneously for the three countries. One by one, were excluded in each country the aspect of housing that was the least significant in all countries, ending up with models only including variables that were significant in at least one of the countries. As a result of our design, we had the same model for every country. Variables not included in these models thus do not add significant information about the perceived health in any of the three countries. When models were established they were later controlled for possible confounding from sex, age, and monthly income. P-values below 0.05 were considered statistically significant.

Ethical considerations

The ENABLE-AGE Project followed ethical principles for research on humans, and in each country involved the project was subjected to ethical review, followed by formal consent according to national regulations. In Latvia, the ENABLE-AGE project process was subjected to review by the Ethics Committee at Riga Stradiņš University and approved (Riga Stradiņš University, 2002) as well certified at State Data Inspection for the storage of personal data.

In order to achieve a general awareness among potential participants, press releases about the project were sent to national news agencies and a press conference at the Riga Stradins University was organized, resulting in newspaper article. Informed consent was gained from all interview participants and they were assured of their anonymity, as stated in oral as well as in written information. Participants were informed that they could withdraw from the interviews if they wished, including a withdrawal of their data at any stage up to publication of results. The interviews could touch on sensitive issues, and in the interviewer training courses as well as during team meetings through the collection process of the data; the interviewers were trained in dealing with such issues and situations. Each participant got an informative letter with participant number and the details of research group for communication.

Results

1. Meaning of everyday activity performance among very old people in Latvia.

Participants described everyday activities that they performed as well as the special value those activities have for them (Figure 4). These differed from person to person, which could be explained with the differences in personal characteristics, values, interests, living environment and past experience.

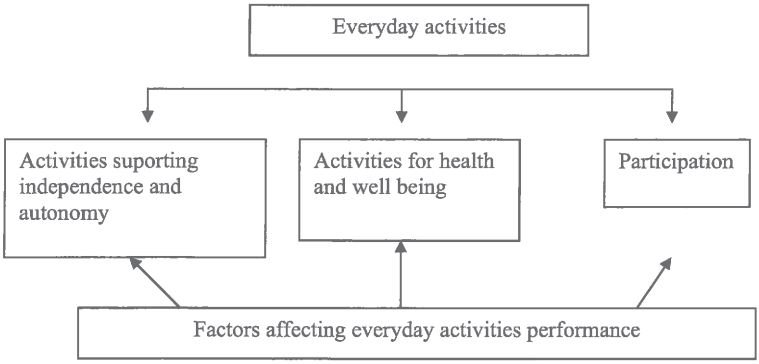

Figure 4. Main categories derived from data anlysis from In-depth interviews.

Independence and autonomy

Most of the participants point out that their days are uniform and determined by the routines and habits that they have developed throughout life and adapted do to current health status. Such uniform daily routine though, signifies the ability of people to maintain independence and adapt to available energy level.

Self care activities usually were performed on regular base and participants talked about them as routine witch developed during the life. The participants noted that in line with the increasing difficulties in performing the activities, the independence in self care was increasingly considered to be a value. Houseworks

usually were performed on regular base as routine and the participants noted that, years passing, they have gradually decreased the performance of some physically straining housework activities, i.e. adapted the performance in accordance with their age and functional abilities.

The old people planed performance of those physically demanding activities or used help from others. There was a different perception of the help; especially in the situations where the participants had help from social care assistant there was strong critique concerning the quality of performed cleaning work and dissatisfaction or feeling of dependence.

The difficulties to maintain the house and need for help in shopping in some extend were perceived as loss of autonomy. In some interviews the reduction of ability in caring of the home also interfered with the feeling of comfort at home. The formal help from social care services were criticized because the helpers did not considered the choice, habits and financial considerations of the person, for example, they did not look for cheaper food. The informal help from friends, neighbours and especially relatives were perceived in more positive way.

Activities for health and well-being

Some participants strongly expressed that walking is very important activity for maintenance of health. Depending from habits and environmental aspects the old people incorporated walking in daily life differently. Walking as well as shopping were most often performed activities outside home.

Some of the participants told about performing house works as activities good for health because they are physically demanding and provide training for ageing body. Besides physical training other participants emphasized that the activities for the preservation of cognitive function, like solving crossword puzzles and rebuses, are necessary.

The ability to help someone else was a factor determining the feeling of well being of a person. Those who had experience of helping other people also were participants with higher subjective health evaluation.

Handcrafts differed among woman and man and were described as habit for persons who use to do it during whole life. Handcrafts as well as gardening and reading could be also described as hobbies performed by old people. In interviews

some participants mentioned other more specific activities performed as hobby- there were examples of different collections (stones, shells, paintings), playing music, drawing, bird watching and feeding, letter writing. All of them had constant place and meaning in the life of the person and performance of those activities were described as important for well being.

Participation

The participants expressed that the everyday activities took more and more energy and they become quickly tired and needed to rest. They revealed that they used to a larger extent performed physically passive and more intellectual activities like watching TV, listening to the radio, reading, solving crosswords to fulfil the time. These activities also had informative aspect- doing them gave connection to the world outside. Watching TV and listening radio also replaced the attendance to cultural events such as the theatre, concerts and exhibitions. Especially if the participants had poor vision, listening the radio seemed to be most important.

The participants mentioned that relationships with relatives are important. The visits and even regular phone calls were highly valued. Thoughts of their closest, beloved persons considerably affected the well being of the participants: Those who had no relatives described the relations with the friends or neighbours in the same way. The importance of continuity of the social contacts was visible; there was no strong interest to establish new contacts. Some participants explained their position concerning social contacts in relation to personal characteristics; for example, if they never had been interested in being together with other people they can better survive alone also in the old age. The neighbours were often mentioned as one important social contact group in cases where those contacts were based on stability and good relationship and changes in social environment (old neighbours died or relocated, new neighbours moved in) affected them negatively.

Organizing informal meetings of friends had a significant role in the life of the elderly but was more characteristic for women. Only some participants noted that leisure activities organized in interest groups and professional organizations were of particular importance. These activities provided sense of belonging, being together and facilitated participation. Mainly women noted that their meaningful social activities are

connected with the occasions organized by the church: services, occasions organized by the whole congregation, charity activities, etc.

Participants, who were overwhelmed with loneliness and depressive mood, pointed out that they used to go outside the home every day, often, to visit supermarkets. It was viewed as an opportunity to be among people, to change the habitual environment. Both- woman and man- pointed out that taking care of animals, taking care of the graves of spouses, relatives and friends are very important to them.

Factors affecting the performance

Many participants expressed that they wanted to engage in more activities than they do but that they were limited by their decreasing abilities and by the poor environmental support. Financially pressing conditions, lack of accessibility of the city and inter-city public transportation for people with functional limitations and influence of season were important factors influencing performance. Participants who experienced the difficulties in performance of activities used adaptive strategies- change the environment or change the way of performing activity.

2. Aspects of housing and healthy ageing in very old age in five European sub-samples.

On the descriptive level, participants in Eastern European samples (Latvia and Hungary) reported lower scores in life satisfaction and higher scores in depression compared with participants in Western European samples (Sweden, Germany, and the UK). Moreover, in Latvia (but not in Hungary) the environmental mastery sum score was low, which is in contrast to all other national samples. Latvian participants also scored highest in objective independence in ADLs compared with all other participants, and their perceived independence in daily living was lowest compared with all other participants (Table 5).

The canonical correlation analysis revealed two significant canonical correlations in all national samples and a third significant *R* only in Sweden, the UK, Hungary, and Latvia. Loadings and standardized canonical coefficients are reported in Table 6.

Table 5. Basic description of healthy aging aspects in the five national samples.

Variable (*M, SD*)	Sweden	Germany	UK	Hungary	Latvia	Diff
	N= 346	N= 450	N= 350	N= 337	N= 267	
Age (years)	80–89	80–89	80–89	75–84	75–84	
ADL independence (0–9)[a]	7.6 (1.6)	7.8 (1.4)	8.0 (1.5)	7.9 (1.5)	8.2 (1.5)	***
Perceived functional independence (0–10)[a]	8.5 (1.9)	8.1 (2.1)	8.0 (1.5)	8.0 (2.5)	7.3 (2.2)	***
Life satisfaction (0–10)[b]	8.5 (1.7)	8.5 (1.8)	8.2 (1.8)	6.6 (2.4)	5.5 (2.0)	***
Environmental mastery (1–5)[c]	4.0 (0.5)	4.4 (0.6)	3.9 (0.5)	4.0 (0.7)	3.2 (0.5)	***
Positive affect (1–5)[d]	3.2 (0.6)	3.4 (0.7)	3.4 (0.6)	3.4 (0.6)	3.1 (0.5)	***
Negative affect (1–5)[d]	2.1 (0.5)	2.0 (0.6)	2.0 (0.6)	2.1 (0.6)	2.5 (0.5)	***
Depression (0–15)[e]	3.0 (2.3)	3.2 (2.9)	3.0 (2.6)	5.5 (3.6)	6.4 (4.0)	***

Notes: [a]Higher scores indicate better ADL independence (ADL Staircase) or perceived functional independence (self-evaluation).

[b]Higher scores indicate higher satisfaction with life (self-evaluation).

[c]Higher scores indicate higher environmental mastery (Ryff scale).

[d]Higher scores indicate stronger affect in this domain (Positive and Negative Affect Schedule).

[e]Higher scores indicate more depressive symptoms (Geriatric Depression Scale).

***p <.001.

The findings from the first canonical correlation indicate a pattern of association between housing and healthy aging such that healthy aging in terms of objective and perceived independence in daily activities and subjective well-being in very old age is closely and consistently related to aspects of objective and perceived housing. In other words, participants with a low magnitude of accessibility problems, but not those with low numbers of barriers, who perceive their homes as meaningful on a behavioral level and partially as useful to perform activities and who consider external influences as irrelevant to their current housing situation (low external control), are or perceive themselves to be more independent in daily activities, feel better in terms of environmental mastery, and suffer less from depressive symptoms. Moreover, we found this pattern across the national samples, suggesting cross-national comparability.

Table 6. Correlations of aspects on housing and healthy aging (first canonical variates).

	Sweden N= 346	Germany N= 450	UK N= 350	Hungary N= 337	Latvia N= 267
Eigenvalues	1.2***	1.3***	1.6***	1.6***	1.8***
Canonical correlations (%)	.74 (73)	.75 (79)	.78 (74)	.78 (72)	.80 (68)
Housing variable set					
Environmental barriers	–.03 (.15)	–.08 (–.01)	–.09 (.07)	–.21 (.21)	.02 (.12)
Magnitude of accessibility problems	**–.73 (–.48)**	**–.61 (–.30)**	**–.67 (–.32)**	**–.69 (–.45)**	**–.69 (–.34)**
Usability in the home					
Physical environmental aspects	**. 45 (.05)**	**.42 (.03)**	**.58 (.09)**	**.43 (.06)**	**.36 (.03)**
Activity aspects	**.64 (.24)**	**.71 (.35)**	**.55 (.08)**	.27 (.03)	**.72 (.28)**
Meaning of home					
Behavioral aspects	**.81 (.45)**	**.74 (.38)**	**.85 (.45)**	**.82 (.40)**	**.86 (.36)**
Physical aspects	.17 (–.08)	**.57 (.17)**	**.68 (.15)**	**.63 (.04)**	**.59 (.03)**
Cognitive–emotional aspects	.34 (.18)	.35 (.03)	**.45 (.10)**	**.61 (.19)**	**.58 (.11)**
Social aspects	.30 (–.03)	.13 (–.08)	.35 (–.09)	**.46 (–.03)**	**.52 (.01)**
Housing-related ext. control beliefs	**–.53 (–.21)**	**–.58 (–.20)**	**–.64 (–.33)**	**–.75 (.34)**	**–.66 (–.26)**
Housing satisfaction	.05 (.06)	.16 (–.03)	.15 (–.09)	.28 (.02)	.08 (.01)
Healthy aging variable set					
Independence in daily activities (ADL)	**.83 (.52)**	**.68 (.37)**	**.75 (.34)**	**.68 (.30)**	**.78 (.37)**
Perceived functional independence	**.80 (.41)**	**.76 (.38)**	**.82 (.37)**	**.80 (.23)**	**.87 (.46)**
Life satisfaction	**.36 (.04)**	**.50 (.13)**	**.47 (–.01)**	**.64 (.08)**	.29 (–.07)
Environmental mastery (Ryff)	**.59 (.23)**	**.76 (.45)**	**.66 (.20)**	**.84 (.41)**	**.58 (.18)**
Depression (GDS)	**–.55 (–.12)**	**–.53 (.01)**	**–.76 (–.42)**	**–.78 (–.24)**	**–.70 (–.32)**
Positive affect (PANAS)	.33 (.05)	**.43 (.10)**	**.39 (.02)**	**.46 (.09)**	**.49 (.04)**
Negative affect (PANAS)	**–.22** (–.06)	–.32 (.01)	–.28 (.06)	**–.39 (.01)**	–.26 (.04)

Notes: Subsamples are reduced as a result of listwise deletion in canonical correlation procedures. Standardized canonical coefficients are shown in parentheses; correlations >.35 are boldfaced. ****p* <.001.

The second canonical correlations also revealed significant patterns of relationships for all national samples; however, the degrees of overall explained

variance were considerably low (≤19%). Loadings and standardized canonical coefficients are reported in Table 7.

Table 7. Correlations of aspects on housing and healthy aging (second canonical variates).

	Sweden N= 346	Germany N= 450	UK N= 350	Hungary N= 337	Latvia N= 267
Eigenvalues	0.2***	0.2***	0.4***	0.3***	0.8***
Canonical correlations (%)	.42 (13)	.41 (13)	.52 (16)	.50 (15)	.58 (19)
Housing variable set					
Environmental barriers	–.14 (–.12)	–.28 (–.18)	.12 (.15)	.24 (.20)	.12 (.04)
Magnitude of accessibility problems	.15 (.13)	.18 (.27)	**.37 (.44)**	–.23 (–.43)	–.25 (.37)
Usability in the home					
Physical environmental aspects	.06 (–.15)	.02 (–.14)	.15 (.15)	.18 (.48)	.17 (.17)
Activity aspects	–.12 (–.13)	–.06 (–.24)	–.03 (–.09)	.01 (–.11)	–.24 (–.54)
Meaning of home					
Behavioral aspects	–.07 (–.39)	–.03 (–.22)	–.08 (–.68)	.03 (.42)	.07 (–.29)
Physical aspects	**.54 (.31)**	**.41 (.34)**	**.51 (.67)**	**–.54 (–.42)**	**.47 (.32)**
Cognitive–emotional aspects	**.61 (.48)**	**.36 (.18)**	**.57 (.44)**	**–.56 (–.37)**	**.54 (.45)**
Social aspects	**.52 (.34)**	**.50 (.40)**	**.50 (.15)**	**–.65 (–.48)**	**.65 (.54)**
Housing-related ext. control beliefs	–.35 (–.32)	–.20 (–.21)	–.21 (–.21)	.21 (.05)	–.16 (–.15)
Housing satisfaction	**.47 (.39)**	**.66 (.65)**	.25 (.11)	–.01 (.12)	.20 (.02)
Healthy aging variable set					
Independence in daily activities (ADL)	–.27 (.40)	**–.54 (–.59)**	**–.48 (–.59)**	**.67 (.74)**	**–.46 (–.55)**
Perceived functional independence	–.23 (–.48)	–.29 (–.38)	–.24 (–.32)	.25 (.32)	–.19 (–.28)
Life satisfaction	**.36 (.03)**	.13 (–.04)	.36 (.11)	–.36 (–.15)	.49 (.14)
Environmental mastery (Ryff)	**.51 (.53)**	**.60 (.78)**	**.52 (.46)**	**–.37 (–.43)**	**.63 (.42)**
Depression (GDS)	**–.61 (–.60)**	–.16 (.04)	**–.40 (–.17)**	**.41 (.48)**	**–.59 (–.40)**
Positive affect (PANAS)	**.51 (.31)**	.17 (.20)	**.47 (.37)**	–.05 (.03)	.33 (.14)
Negative affect (PANAS)	–.15 (.16)	**–.45 (–.18)**	**–.47 (–.25)**	–.13 (–.16)	**–.47 (–.18)**

Notes: Subsamples are reduced as a result of listwise deletion in canonical correlation procedures. Standardized canonical coefficients are shown in parentheses; correlations >.35 are boldfaced.

***p <.001.

The findings from the second canonical variate indicate a pattern of association between housing and healthy aging such that nonbehavioral aspects of meaning of home are related to healthy aging in terms of independence in daily activities (except for Sweden) and subjective well-being in terms of environmental mastery, and for some national samples also with depression and affect. In other words, participants who perceive their homes as meaningful as a result of physical, social, or cognitive–emotional aspects tend to be more independent in daily activities, feel better in terms of environmental mastery, and—in some national samples—in terms of positive affect; they also suffer less from depressive symptoms and negative affect.

As one can see in Table 8, the first canonical correlations are highly congruent across the five national samples; that is, this first relational pattern appears rather general and not sample specific, indicating a dominant common pattern of relationships between aspects of housing and healthy aging. In contrast, the second relational pattern comes with lower congruence scores across the national samples and hence comprises more specific aspects of relationships between housing and healthy aging.

Table 8. Pairwise comparisons of loading patterns for the five national samples.

Congruence Scores of Canonical Correlation Loadings	Sweden	Germany	UK	Hungary	Latvia
Sweden	—	0.85	0.91	–0.78	0.91
Germany	0.96	—	0.88	–0.80	0.85
UK	0.97	0.98	—	–0.86	0.97
Hungary	0.91	0.95	0.97	—	–0.85
Latvia	0.97	0.97	0.98	0.95	—

Notes: Tucker's coefficients of congruence (Broadbooks & Elmore, 1987) are used. Congruence scores of the first canonical correlation loadings between each research site are listed in the lower left part of the table (i.e. below the diagonal of empty cells); congruences of the second canonical loadings are shown in the upper right part. Because of inverse loading patterns (see Tables 6 and 7), negative scores occur in some national samples.

3. Relation of housing aspects to perceived health among ADL independent and ADL dependent groups of very old people in the Germany, Sweden and Latvia.

The background characteristics of study sample are displayed in Table 9. Comparisons between the three countries within each ADL group as well as between ADL groups within each country showed statistically significant differences for all aspects of housing except accessibility problems in the ADL independent group (Table 10). Even if the number of environmental barriers in housing in Latvia was lower, in the ADL dependent group there were higher scores of accessibility problems than in Germany and Sweden. Further in Latvia, participants had smaller number of rooms and revealed lower housing satisfaction in both ADL groups. Also, the different aspects of usability and meaning of home had lower scores in Latvia and higher scores of external housing related control beliefs in both ADL groups. Concerning number of environmental barriers, housing standard (number of rooms) and housing satisfaction, there were no significant differences between the two ADL groups in any of the countries. There were differences between ADL groups concerning usability and meaning of home aspects. Overall, ADL dependent groups had higher scores of external housing related control beliefs.

Studying relationship between perceived health and different aspects of housing in the ADL groups, variant patterns were displayed (Table 11). Accessibility problems were stronger related to perceived health in all three countries, in both ADL groups. Especially in the ADL dependent group in Sweden, perceived health was influenced by perceived housing aspects. Similar but slightly weaker relations were found in the ADL independent groups in Sweden and Latvia.

Turning to the multivariate regression analyses (Table 12), the results show that for persons with different levels of ADL dependence in the three national samples, different aspects of housing were related to perceived health. Objective aspects of housing influenced perceived health among the ADL independent participants in all three national samples, in particular accessibility problems. When it came to perceived aspects of housing (i.e. various aspects of usability and meaning of home) the result pattern was more varied. Among participants dependent in ADL, objective as well as perceived aspects of housing were influential on perceived health, while there were differences among the national samples. None of the considered confounders influenced the results.

Table 9. Background characteristics, functional limitations/dependence on mobility devices and perceived health (the outcome variable), per country and for ADL groups

		ADL independent group				ADL dependent group				pb		
		German y n = 149	Latvia n = 202	Sweden n = 151	pa	German y n = 270	Latvia n = 90	Swede n n = 236	pa	Ger	Lat	Swe
Sex (%)	Male	18.8	12.9	15.9	n.s.	24.1	7.8	31.4	0.000	n.s.	n.s.	0.001
	Female	81.2	87.1	84.1		75.9	92.2	68.6				
Age (years)	Mean (SD)	84.4 (3.1)	78.9 (2.5)	83.7 (3.0)	0.000	86,3 (3.0)	80.7 (2.3)	86.2 (2.9)	0.000	0.001	0.000	0.000
Monthly income (Euro)												
	Median (Q1-Q3)	1375 (1000-1825)	100 (100- 100)	900 (800-1025)	0.000	1500 (1000- 2000)	100 (100- 100)	900 (800- 1170)	0.000	n.s.	n.s.	n.s.
No. of functional limitations												
	Median (Q1-Q3)	2 (1-4)	2 (2-4)	2 (1-4)	0.015	4 (2- 6)	4.5 (3- 6.25)	3 (2- 5)	0.000	0.000	0.000	0.000
Dependence on mobility devices (%)												
	Yes	15.4	9.4	22.5		43.7	61.1	55.9				
	No	84.6	90.6	77.5		56.3	38.9	44.1				
In general would you say your health is (%)												
	Poor	2.0	20.3	2.0		10.4	54.4	4.7				
	Fair	47.7	61.9	18.5		54.1	41.1	28.4				
	Good	39.6	15.8	31.1	0.000	26.7	3.3	32.6	0.000	0.000	0.000	0.000
	Very good	8.7	1.0	29.1		7.8		24.2				
	Excellent	2.0	0.5	19.2		0.7		10.2				

pa – differences between countries
pb – differences between ADL groups

Table 10. Objective and perceived aspects of housing per country and for ADL groups

		ADL independent group				ADL dependent group				P^b		
		Germany	Latvia	Sweden	p^a	Germany	Latvia	Sweden	p^a	Germany	Latvia	Sweden
		n=149	n = 202	n = 151		n = 270	n = 90	n = 236				
No. of environmental barriers[a]	Median (Q1-Q3)	66 (61-72)	55 (50-62)	67 (57-74)	0.000	66 (60- 73)	54 (47- 62)	63 (56- 73)	0.000	n.s.	n.s.	n.s.
Accessibility Problems[b]	Median (Q1-Q3)	77 (28-136)	80 (45-150)	68 (13-165)	n.s.	163 (63- 277)	212 (127- 297)	173 (75- 263)	0.004	0.000	0.000	0.000
Housing standard, no of rooms	Median (Q1-Q3)	3 (2- 3)	1 (1- 2)	3 (2- 3)	0.000	3 (2- 3)	1 (1- 2)	3 (2- 4)	0.000	n.s	n.s	n.s
UIMH[c], Activity aspects	Median (Q1-Q3)	20 (18-20)	16 (14-18)	19 (18-20)	0.000	18 (15- 20)	11 (7- 15)	18 (15- 20)	0.000	0.000	0.000	0.001
UIMH, Environmental aspects	Median (Q1-Q3)	29 (25-30)	19.2 (16 -22.8)	29 (27-30)	0.000	27 (24- 29)	15 (12- 21)	28 (25- 30)	0.000	0.000	0.000	0.017
Housing satisfaction[d]	Median (Q1-Q3)	5 (4- 5)	4 (2- 4)	5 (5- 5)	0.000	5 (4- 5)	4 (3- 5)	5 (5- 5)	0.000	n.s	n.s	n.s
MOH[e], Physical aspects	Median (Q1-Q3)	9.57 (8.57-10.00)	6.93 (6.00-7.77)	9.14 (8.43-10.00)	0.000	8.85 (8.42- 9.71)	6.14 (5.33- 7.16)	9.07 (8.42- 10.00)	0.000	0.000	0.000	n.s
MOH, Activity aspects	Median (Q1-Q3)	9.83 (8.83-10.00)	7.83 (7.00-8.33)	9.67 (8.67-10.00)	0.000	8.83 (7.66- 9.83)	5.83 (4.71- 7.00)	8.33 (7.00- 9.50)	0.000	0.000	0.000	0.000
MOH, Cognitive/ emotional aspects	Median (Q1-Q3)	9.00 (8.30-9.50)	7.80 (7.10-8.50)	8.80 (8.20-9.15)	0.000	8.80 (8.10- 9.30)	7.30 (6.41- 7.90)	8.50 (7.70- 9.00)	0.000	n.s	0.001	0.002
MOH, Social aspects	Median (Q1-Q3)	8.00 (7.00-8.80)	7.00 (6.00-8.20)	9.00 (8.00-10.00)	0.000	8.00 (7.00- 9.00)	6.25 (5.05- 7.71)	8.80 (7.60- 10.00)	0.000	n.s	0.002	n.s
Housing related control beliefs[f], External control	Median (Q1-Q3)	2.56 (2.13-3.06)	3.00 (2.73-3.25)	2.75 (2.38-3.00)	0.000	2.93 (2.43- 3.37)	3.31 (3.06- 3.56)	2.87 (2.56- 3.25)	0.000	0.000	0.000	0.000

p^a – differences between countries
p^b – differences between ADL groups
[a] Higher scores indicate higher amount of environmental barriers
[b] Higher scores indicate higher accessibility problems
[c] Higher scores indicate greater subjective housing usability (Usability of My Home questionnaire)
[d] Higher scores indicate higher satisfaction (Housing Options for Older People questionnaire)
[e] Higher scores indicate higher agreement in satisfaction (Meaning of Home questionnaire)
[f] Higher scores indicate stronger beliefs in this domain (Housing – Related Control Beliefs questionnaire)

Table 11. Univariate analyses of perceived health, per country and for ADL groups

		ADL independent group			ADL dependent group		
		Germany	Latvia	Sweden	Germany	Latvia	Sweden
		n = 149	n = 202	n = 151	n = 270	n = 90	n = 236
No. of environmental barriers	Estimate	0.031	**0.030**	**-0.027**	0.003	0.026	**-0.037**
	(95% CI)	(-0.005; 0.067)	**(0.003; 0.057)**	**(-0.055; 0.000)**	(-0.020 ; 0.027	(-.059 ; 0.014)	**(-0.058 ; -0.017)**
	P-value	0.089	**0.030**	**0.048**	0.785	0.223	**0.000**
Accessibility Problems	Estimate	**-0.008**	**-0.007**	**-0.008**	**-0.004**	**-0.005**	**-0.005**
	(95% CI)	**(-0.013 ; -0.004)**	**(-0.010 ;-0.004)**	**(-0.011; -0.005)**	**(-0.005 ; -0.002)**	**(-0.008 ; -0.001)**	**(-0.007 ; -0.003)**
	P-value	**0.000**	**0.000**	**0.000**	**0.000**	**0.017**	**0.000**
Housing standard, no of rooms	Estimate	**0.235**	**0.592**	0.184	0.033	-0.512	0.108
	(95% CI)	(-0.060; 0.531)	**(0.097; 1.087)**	(-0.051; 0.419)	(-0.139 ; 0.204)	(-1.273 ; 0.248)	(-0.072 ; 0.288)
	P-value	0.118	**0.019**	0.125	0.708	0.187	0.241
UIMH, Activity aspects	Estimate	-0.056	0.077	**0.210**	0.031	**0.098**	**0.121**
	(95% CI)	(-0.203; 0.090)	(-0.009; 0.163)	**(0.068 ; 0.352)**	(-0.030 ; 0.094)	**(0.006 ; 0.190)**	**(0.051 ; 0.191)**
	P-value	0.453	0.078	**0.004**	0.318	**0.036**	**0.001**
UIMH, Environmental aspects	Estimate	-0.036	**0.110**	**0.147**	**0.112**	0.049	**0.143**
	(95% CI)	(-0.129; 0.058)	**(0.047-0.173)**	**(0.044 ; 0.249)**	**(0.052 ; 0.171)**	(-0.026 ; 0.126)	**(0.078 ; 0.208)**
	P-value	0.457	**0.001**	**0.005**	**0.000**	0.202	**0.000**
Housing satisfaction	Estimate	-0.165	-0.029	**0.848**	0.067	**-0.322**	0.489
	(95% CI)	(-0.524 ; 0.193)	(-0.233 ; 0.176)	**(0.351 ; 1.346)**	(-0.280 ; 0.414)	(-0.646 ; -0.002)	(0.109 ; 0.868)
	P-value	0.366	0.785	**0.001**	0.705	0.052	0.12
MOH, Physical aspects	Estimate	0.148	0.211	**0.530**	0.213	0.071	**0.377**
	(95% CI)	(-0.160 ; 0.455)	(-0.006 ; 0.428)	**(0.227-0.833)**	(-0.011 ; 0.438)	(-0.212 ; 0.355)	**(0.165 ; 0.588)**
	P-value	0.347	0.057	**0.001**	0.063	**0.622**	**0.000**
MOH, Activity aspects	Estimate	0.079	**0.339**	0.240	**0.248**	**0.268**	0.093
	(95% CI)	(-0.284 ; 0.441)	**(0.122 ; 0.556)**	(-0.078 ; 0.558)	**(0.076 ; 0.420)**	**(0.001 ; 0.535)**	(-0.036 ; 0.224)
	P-value	0.671	**0.002**	0.139	**0.005**	**0.049**	0.159
MOH, Cognitive/emotional aspects	Estimate	0.039	**0.360**	0.411	0.045	**0.358**	0.204
	(95% CI)	(-0.317 ; 0.395)	**(0.110 ; 0.610)**	(0.031 ; 0.791)	(-0.225 ; 0.315)	**(0.014 ; 0.702)**	(-0.008 ; 0.415)
	P-value	0.828	**0.005**	0.34	0.742	**0.041**	0.060
MOH, Social aspects	Estimate	-0.107	**0.273**	0.210	-0.036	0.179	**0.187**
	(95% CI)	(-0.295 ; 0.081)	**(0.102 ; 0.445)**	(-0.031 ; 0.451)	(-0.189 ; 0.117)	(-0.062 ; 0.420)	**(0.031 ; 0.342)**
	P-value	0.265	**0.002**	0.087	0.644	0.145	**0.018**
Housing related control beliefs, External control	Estimate	**-0.532**	-0.526	-0580	**-0.549**	-0.303	**-1.186**
	(95% CI)	**(-1.042 ; -0.023)**	(-1.283 ; 0.231)	(-1.1228 ; 0.068)	**(-0.942 ; -0.156)**	(-1.279 ; 0.674)	**(-1.703 ; -0.670)**
	P-value	**0.040**	0.173	0.080	**0.006**	0.543	**0.000**

Note: In bold represented variables where P-values below 0.05 were considered statistically significant.

Table 12. Results of regression analyses per country and for ADL groups, with perceived health as the outcome variable

		ADL independent group			ADL dependent group		
		Germany n=149	**Latvia n=202**	**Sweden n=151**	**Germany n=270**	**Latvia n=90**	**Sweden n=236**
No. of environmental barriers	Estimate (95% CI) P-value	**0.047 (0.009 ; 0.086) 0.017**	**0.056 (0.025 ; 0.088) 0.001**	-0.001 (-0.031 ; 0.029) 0.963	0.003 (-0.021 ; 0.029) 0.768	-0.007 (-0.021; 0.029) 0.803	**-0.028 (-0.051; -0.005) 0.014**
Accessibility problems	Estimate (95% CI) P-value	**-0.010 (-0.014 ; -0.005) 0.000**	**-0.009 (-0.013 ; -0.005) 0.000**	**-0.008 (-0.011 ; -0.005) 0.000**	**-0.003 (-0.005 ; -0.001) 0.004**	-0.003 (-0.060 ; 0.047) 0.247	**-0.004 (-0.006 ; -0.001) 0.001**
UIMH, Environmental aspects	Estimate (95% CI) P-value	-0.010 (-0.132 ; 0.112) 0.872	**0.107 (0.035 ; 0.178) 0.003**	-0.047 (-0.170 ; 0.075) 0.450	**0.108 (0.032 ; 0.0183) 0.005**	0.024 (-0.073 ; 0.123) 0.625	0.005 (-0.073 ; 0.083) 0.898
Housing satisfaction	Estimate (95% CI) P-value	-0-234 (-0.687 ; 0.219) 0.311	-0..050 (-0.284 ; 0.183) 0.672	**0.911 (0.364 ; 1.458) 0.001**			
MOH, Physical aspects	Estimate (95% CI) P-value	0.279 (-0.071 ; 0.629) 0.119	-0.057 (-0.328 ; 0.214) 0.678	**0.412 (0.091-0.733) 0.012**	0.090 (-0.170 ; 0.351) 0.497	-0.045 (-0.455 ; 0.364) 0.828	**0.300 (0.061 ; 0.539) 0.014**
MOH, Cognitive/emotional aspects	Estimate (95% CI) P-value				-0.189 (-0.498; 0.120) 0.231	**0.550 (0.105; 0.996) 0.015**	0.170 (-0.061; 0.402) 0.151
MOH, Social aspects	Estimate (95% CI) P-value	**-0.229 (-0.443; -0.015) 0.036**	0.148 (-0.055; 0.351) 0.153	0.144 (-0.112; 0.400) 0.271			
Housing related control believs, external control	Estimate (95% CI) P-value				-0.380 (-0.796; 0.035) 0.073	0.742 (-0.500; 1.984) 0.242	**-0.753 (-1.312; -0.194) 0.008**
Pseudo R-Square	Cox and Snell	0.183	0.206	0.288	0.126	0.124	0.228
	Nagelkerke	0.207	0.240	0.305	0.140	0.157	0.241
	McFadden	0.093	0.118	0.118	0.058	0.085	0.089

Note: In bold represented variables where P-values below 0.05 were considered statistically significant.

Discussion

The findings of this thesis represent quite novel knowledge on home and health among very old Europeans, viewed from a Latvian perspective. Applying quantitative as well as qualitative methodology, the three studies building up the thesis give valuable information on different aspects of home and health in very old age. The qualitative paper illustrates in depth what old single-living people in urban Latvia are doing at home and what meaning the activities they perform have to them. The cross-national findings demonstrate relationships between aspects of housing and health and show that, despite obvious differences between the countries in terms of socio-economic standard, societal support systems, culture, etc., the relationships are surprisingly similar across countries. The sub-group differences demonstrated pinpoint the need for more differentiated considerations based on differences in ADL capacity, including issues of housing provision meeting the needs of different groups of older people.

The importance of supporting older people's activity performance is well documented in the research literature while Study 1 of this thesis is the first study ever from a Latvian perspective. Different activities seem to help very old people to organize and structure the flow of their time. Further, activity performance not only supports daily life but also support maintenance of valued social roles, feeling of health and well-being. These findings confirm the Activity theory (Havighurst, 1962) statement that there is positive relationship between activity performance and life satisfaction. The ageing process and functional decline impact on the patterns of how very old people construct their everyday life. A unique possibility given by the ENABLE-AGE Project context was to compare qualitative findings across countries. Results from the Swedish ENABLE-AGE In-depth Study are similar to the Latvian results presented in Study 1, showing that having a sense of being independent as regards all forms of activity, such as household chores, means a lot for very old people's self-confidence. Further, such chores seem to have a confirmatory effect, followed by experiences of pride and satisfaction linked to home. With great similarity between countries as diverse as Sweden and Latvia, very old people continuously struggle for independence by performing activities in the way they had always been performed (Haak M., Fange A., Iwarsson S., Dahlin Ivanoff S., 2007).

Daily activities performed by old people at home in Latvia were most common and it relate with findings in studies from other countries because the home environment is the person's major living space in old age, in terms of the increased time people spend at

home, as well as in terms of the number of activities that takes place inside the home (Baltes M M, Maas I, Wilms U U, Borchelt M, Little T., 1999).

Activities providing interaction with other people in a familiar context and providing feelings of belonging, to be part of the world, are important to old people. Also the fact that many very old people put a lot of value in doing things for others as well as doing productive things confirms that productivity is important for older people and that it is important that the product is valued by others (Jackson J., 1996). Other research shows that feelings of still being able to contribute with knowledge and skills, and a sense of being worth something seem to strengthen personal identity, and added to the feeling of still being a valued part of the society (Haak, M., Dahlin Ivanoff, S., Fänge, A., Sixsmith, J., & Iwarsson, S., 2007). The findings also indicate that factors such as financial limitations, health status, functional limitations, and environmental barriers can affect very old people's activity and participation negatively.

Turning to the investigation of relationships between aspects of housing and healthy ageing in very old age, we found that a more accessible and usable home, a strong attachment to the home environment and less external control beliefs are linked to higher functional autonomy and better well-being in terms of more environmental mastery and lower depression scores. The data gave empirical evidence that both objective and perceived housing aspects are related to indicators of healthy ageing. However, not the number of barriers in the home environment, but the magnitude of p-e fit (accessibility) prove being influential on healthy ageing. In addition, particularly behavioural aspects of the meaning of home are closely linked with selected domains of healthy ageing. In contrast however, housing satisfaction, life satisfaction and global positive and negative affect indicators did not play a major role in the pattern of relationships of housing and healthy ageing. In addition, it was shown that, in accordance with the assumptions in the literature, functional health outcomes such as autonomy in day-to-day living is triggered by objective housing accessibility, i.e. p-e fit. Thus, this thesis contributes to the empirical knowledge base demonstrating that outcomes of healthy ageing in very old age are substantially linked to variation in environmental contexts (Scheidt R J, Norris-Baker C., 2003; Kahana E., 1982; Lawton M. P., 1987). Moreover, as far as meaningful aspects of housing are concerned, it was shown that, in accordance with the assumptions in the literature, loss in cognitive or emotional aspects of well-being such as depression is at least partially linked to subjective home-related processes, such as meaning of home, usability in the home and housing-related control beliefs. Thus, processes of perceived housing are

important facets of the p-e system in later life, adding to a wider understanding of housing and healthy ageing (Lilja M., 2000; Rubinstein R. L., De Medeiros K., 2003; Rowles G. D., Oswald F., Hunter E. G., 2003; Rowles G. D., Watkins J. F., 2003).

From a broader perspective on healthy ageing, independence in daily life and well-being indicating a "good life, is linked to both objective and perceived housing. That is, the results indicate that it is not sufficient to consider only objective or subjective aspects of housing. Instead it seems to be appropriate to always address both domains, even if only behavioural, cognitive or emotional aspects are of interest, as they are independently related to such aspects of functional independence and psychological well-being. Especially this aspect need to be considered in relation to optimised housing counselling and adaptation for future cohorts of older adults.

Turning to the results of Study 3, different aspects of housing seem to be influential on perceived health depending on whether the very old person is independent or dependent in ADL. Although not consistent, there is a tendency that objective aspects of housing are more influential on perceived health among ADL independent very old people than among those dependent on help from others. That is, these results indicate that accessibility problems might be of different importance to persons with different ADL capacity, on a general level supporting Lawton and Nahemow's docility hypothesis (Lawton M P, Nahemow L., 1973).

The ENABLE-AGE project provided empirical support for at least partially cross-national comparability of the relationship of housing and healthy ageing in different European sites, indicating the global importance of housing for healthy ageing. Discussions in previous literature (Kohn M.L., 1987) support the value and importance of cross-national research for establishing the generalisability of findings and the validity of interpretations derived from single national studies. Within this thesis only data from first wave of the ENABLE-AGE Project were used, while longitudinal analyses are needed to show whether relations between objective and subjective housing, or between housing and healthy ageing, will remain stable or change over time.

Methodological considerations

Since this thesis is based on data from a large European inter-disciplinary project, it is necessary to discuss advantages and disadvantages of this experience. From a Latvian perspective it was a great opportunity to have the resources needed to be able to target very old people in their home settings, and allowed us to collect unique information on different aspects of ageing, health, and housing. In particular, this was challenging for the occupational therapists involved in the national project team, representing a young profession in Latvia. Overall, it was important but challenging to keep up with the competence standards of occupational therapy and geriatrics, and required professional skills for interviewing and observing very old people outside the clinical setting. Taking an active role in a cross-national research consortium was also challenging and inspiring.

To date, the data collected have not been utilized to the full potential. Thus, during years to come they can serve as base for further exploration of aspects of home and health in Latvia. Moreover, they continue to deepen the co-operation with the former ENABLE-AGE partners on research questions in the European context. As cross-national research on very old people living in the community still is in its infancy, the findings have potential to nurture the evolution of cross-national research in Europe. In particular in Eastern Europe, research involving detailed data collection with very old people in private homes is virtually non-existing, and thus even the descriptive level of the results presented are quite unique.

It should be kept in mind that the ENABLE-AGE Project had an explicitly explorative approach and the samples were not nationally representative. Thus, the results presented are indicative and point out directions for further research. The sampling was difficult since data collection during home visits represented a new phenomenon in Latvia. Often people were suspicious, they considered offers to participate in research with anxiety, and were mostly negatively disposed. Comparatively poor living conditions that are quite common to very old people in Latvia as well as cases of violence and criminal offences strengthened the negative attitudes towards participation in the project.

It is important to have in mind that the frailest group of very old people living at home was very difficult to reach for this study. In order to compensate for such weaknesses, alternative sampling strategies could have been applied, e.g. by means of using different health care agencies in order to reach this segment of the very old population. In Study 3, based on data from Germany, Latvia and Sweden, the sample sizes

differed between the ADL groups. In particular, the ADL dependent group in Latvia was smaller, with only few men. The reasons for this were mainly the shorter life expectancy among men in the country, and the fact that in Latvia those living until higher ages seldom live alone. Another issue worth discussing is that it would have been of interest to study three ADL dependence levels as often done in ageing research, but the small sub-group samples in all national samples did not really allow for valid analyses using such an approach.

The results describe the situation of older people living in different urban regions of Europe, while the situation of those living in rural areas remains unknown. Probably, the social situation in the countryside is more disadvantaged, including limited access to and quality of health care services, impacting on mortality rates and for this group of the population (SVA, 2005). Studies on rural elderly, including comprehensive data collection such as in the ENABLE-AGE Project, does not exist in Latvia and is very scarce also on an international level. Further studies are needed to reveal if comparable patterns of relations among aspects of home and health exist in other groups of elders or in other research districts.

The opportunity to work in a cross-national and inter-disciplinary context allows to afforce quantitative and develop qualitative methods in rehabilitation research, particularly in occupational therapy, in Latvia. Qualitative research methods do not have strong traditions in health care research in Latvia, and the lack of multi-disciplinarity in the national research team and of experience in qualitative research could have had an impact on the data analysis process. Therefore, extra support from the scientifically more experienced ENABLE-AGE partners was provided along the project period, in order to facilitate and ensure quality of the data gathering and analysing process. Interviewing very old people could be complex, and diversities and differences in age and sex between the interviewer and the interviewee most probably have significant implications. In this respect, the fact that the interviewer team in Latvia consisted solely of young female interviewers is a limitation or source of bias worth keeping in mind.

Conclusions

- Very old people in Latvia maintain their well-being through the subjective choice and integration of different activities into their everyday life and this match the kind of universal pattern within the ageing process.
- It is necessary to consider everyday activity performance (functional health) in the decision process aiming to provide the appropriate services to very old people. The evaluation of needs should include not only assessment of P-ADL but also of a wider range of I-ADL, emphasizing different aspects of activity and participation.
- Aspects of housing are particularly linked to objective and perceived independence in daily life. The accessibility at home is linked to behavioral autonomy, and it is not only behavioral autonomy that is linked to various aspects of housing, but also aspects of well-being.
- Accessibility problems influence perceived health among very old people, while more pronounced among those independent in ADL (earlier stage of age-related functional decline) and this finding shows cross-national similarity among three countries (Germany, Sweden, Latvia).
- The pattern of relations between perceived aspects of housing and perceived health in very old age is more varied and displays diversity among three national samples (Germany, Sweden, Latvia).

Practical recommendations

- The attention in practice is paid to objective aspects of housing, but a more holistic approach that takes perceived aspects of housing into account should be applied. The "home assessment package" used in this project, including evaluation of objective as well as perceived aspects of housing has potential to strengthen research and practice efforts targeting housing adaptations and housing provision for senior citizens across Europe.
- Important result of ENABLE-AGE project in Latvia was wide range of assesments, translated in Latvain and Russian. During the project these assesments were tested and optimised and now are available for occupational therapists as well as other specialists in everyday practice with very old people, especially at their homes.

- Housing solutions for senior citizens should include a multidisciplinary approach to assessment and care planning. Home modifications and relocation should be negotiated with older persons themselves to take into account their personal needs and preferences. That is, the principles of client-centered practice shuold be applied.
- The results indicate that different levels of functional independence demand different environment adaptations. That is, objective aspects of housing should be assessed and adaptations effectuated in early stages of functional decline, when ADL independence still remains.
- Using the Housing Enabler assessment results to come up with individually tailored intervention plans, housing adaptation can serve as a preventive measure with potential to maintain ADL independence in old and very old age. In current practice, this kind of intervention is most often used as a compensatory solution in cases when ADL independence already is declined or turned into dependence.
- Concerning perceived aspects of housing, the results are somewhat mixed. This kind of knowledge is new and draws the attention to the fact that intervention in the homes of old and very old people are not only a technical matter of housing design and removal of physical barriers and risk factors. Future research is still necessary to nurture the development of evidence-based, practical interventions, but the results of this thesis emphasize that perceived aspects of housing should not be neglected in community-based health care.

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