

Social Capital and Health in the Oldest Old: The Umeå 85+ Study

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Abstract

The aim of this study was to measure social capital in the oldest old, and its association with different dimensions of health. The Umeå 85+ study is a cross-sectional study of 253 people, aged 85 years, 90 years and 95 years or older. A principal component factor analysis was performed to assess classes of information measuring the structural and the cognitive components of social capital on an individual level. In the final model, one factor consisting of attachment, social integration and social network emerged which accounted for 55 per cent of the total variance. We analysed the association between structural social capital and various dimensions of health. Structural social capital may partially explain depressive symptoms but not functional ability or self-rated health. We conclude that social capital is a relevant resource for the oldest old, but we suggest a different approach when measuring social capital in this age group, such as conducting a longitudinal study or including retrospective questions in the study. The oldest old may have had a high level of social capital, but our study could not identify this statistically.

Keywords: social capital, functional ability, self-rated health, depressive symptoms, oldest old.

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Introduction

There is a long research tradition and prominent evidence that sociodemographic characteristics such as educational level, socio-economic status, marital status as well as psycho-social characteristics including social networks and support have an effect on different health outcomes (e.g. Berkman & Syme 1979; Kaplan et al. 1987; Mendes de Leon et al. 2001; Unger et al. 1999; Fratiglioni et al. 2000). Researchers are also increasingly aware that social capital can be important in understanding differences in health in the general population (Kawachi & Berkman 2000) and may be of particular importance for older age groups (Cannuscio, Block & Kawachi 2003).

Social capital is a multidimensional concept and is usually defined on a micro (Putnam 2000; Lin 1999; Bourdieu 1986) or macro level (Putnam 1993; Putnam 2000; Coleman 1990) depending on the theoretical approach and scientific discipline. In the sociological tradition, social capital is usually seen as an individual resource including social networks, support and trust in local environments and in relations between individuals (Coleman 1990; Bourdieu 1986), whereas in the political science tradition, social capital is seen as the key characteristics of communities, regions and states rather than of individuals (Putnam 1993). A society with high levels of social capital is characterized by high levels of social participation, trust in other people and reciprocity that enhance interactions with other people. In this tradition one can gain the benefits of living in an area with a high level of participation even if you do not participate yourself.

Although social capital has been approached in diverse ways, the core concepts within the social capital literature both theoretically and when it comes to operationalisation of social capital in empirical studies are social networks, that is the structural aspect of social capital and trust, the cognitive aspect (Stone 2001). Some authors stress the structural aspect of social capital as the essence of the concept rather than the cognitive aspect while others argue the opposite. This study concerns both aspects of social capital.

There is a long tradition that examines the nature of social networks (Coleman 1990; Granovetter 1973; Burt 1992). In social capital, a distinction is usually made between strong and weak ties and between bridging and bonding ties. Coleman (1990) argues that strong and dense networks affect the access to information and facilitate sanctions, which makes it safer for people in the network to trust each other. Hence, social networks are seen as a source of trust and commitment. Burt (2001), on the other hand, sees the advantage of weaker ties between individuals especially when seeking work. A person who holds a connecting position between two unconnected groups gets information faster than others. Putnam (2000) distinguishes between bridging and bonding social capital. Bridging social capital refers to inclusive networks and is usually outward looking (e.g. diverse associations) whereas bonding social capital refers to exclusive networks and constitutes homogeneous groups (e.g. professional groups).

The second central dimension of social capital, trust, may be subdivided into two aspects: trust in other people and trust/confidence in institutions (Putnam 1993; Luhmann 1979; Seligman 1997). Trust in other people is usually further divided into generalized trust (Putnam 1993) and particularized trust or trust in familiar people (Uslaner 2002). Put simply, particularized trust exists with known people, whereas generalized trust is an abstract trust in others and is seen as the hard core of the social capital concept. Institutional trust refers to trust or confidence in institutions of governance (Seligman 1997).

Since Putnam's *Making Democracy Work* (1993), a pivotal text with regard to the macro approach of social capital, research on social capital has escalated, not only in the field of political science but also in a broad variety of disciplines including public health (Macinko & Starfield 2001). As mentioned earlier, social capital is usually regarded as a resource on the individual or collective level, although Macinko and Starfield (2001) have proposed that social capital functions on four different levels within public health research. On the macro level, the historical, social, political and economic contexts are important for understanding how social capital is produced. At the neighbourhood or meso level, the focus is on characteristics of the neighbourhoods or communities that may affect social capital. The third level consists of individual level behaviours such

as social participation and cooperation with others. The fourth level consists of individual attitudes of psychological characteristics such as trust and confidence.

To date, social capital seems to be associated with a great variety of health outcomes, including individual self-rated health (Hyypä & Mäki 2001; Kawachi, Kennedy & Glass 1999), individual physical health (Hyypä & Mäki 2001; Rose 2000), psychological health (McCulloch 2001) and mortality (Kawachi et al. 1997). However, contradictory results have also been published (e.g. Veenstra 2000; Kennelly, O'Shea & Garvey 2003), and some have questioned the value of the concept within health research (Hawe & Shiell 2000). The concept has been criticized to be too vague and difficult to measure and operationalise. Furthermore, the common survey design, cross-sectional studies, does not reveal the causal relationship. However, these empirical and methodological concerns are shared with other areas of social science research. We argue that, in line with Macinko and Starfield (2001), a first step to improve this concept is to clarify on which level we measure and operationalise social capital. Theoretically, individual as well as collective levels are appropriate, but different techniques are used depending on whether social capital is measured on the micro or macro level or on both levels.

Although one challenge in social capital and health research, as we see it, is to disentangle the effect of macro and micro social capital (e.g. Veenstra 2005), individual-level studies can still shed some light on the relationship between social capital and health, especially in rarely studied research groups, like the oldest old. Studying the oldest old means investigating a selected group: the "survivors". One could argue that sociodemographic and psycho-social associations with health outcomes may be weak or non-existent due to prior selection, but contradictory results have been published (Grundy, Bowling & Farquhar 1996; Martelin, Koskinen & Valkonen 1998). Even in the oldest age groups, sociodemographic characteristics as well as psycho-social characteristics are differentiated with regard to health and mortality, which indicate that reducing mortality and increasing health and well-being even in the oldest old is possible.

Issues relating to social capital on an individual level are of particular relevance to the oldest old age group for a number of reasons. First,

social capital constitutes aspects of family relationships, social networks, trust and a sense of belonging, which has been proven to be relevant for older people's everyday life, health and well-being (Bowling 1994; Glass et al. 1997). Secondly, people in the oldest age groups are especially vulnerable to decreasing social networks since they are at greater risk at losing their spouses and friends, which at the same time makes them more dependent on available social capital at different levels in society (Cannuscio, Block & Kawachi 2003). Thirdly, research that links social capital with health hypothesizes that social capital affects health through various mechanisms, which are of relevance also for the oldest old. The presence of social capital may influence health behaviour, help people to access better resources and services (e.g. medical service) or act as a buffer against stressful events (e.g. loss of a spouse) (Kawachi & Berkman 2000).

Consequently, in this study we examine social capital on an individual level including structural and cognitive components as an important aspect of health research for the oldest old. The objective is to examine if there is an independent association between social capital and multiple measures of health, when taking into account gender and age.

Methods

The study sample

This study was part of the Umeå 85+ study, which is described in detail elsewhere (von Heideken Wågert et al. 2006). A random sample, comprising half of the population born in 1915 (85 year olds), the total population born in 1910 (90 year olds) and between 1897 and 1905 (≥ 95 year olds) living in the municipality of Umeå, Sweden, on the 1st of January, 2000 was selected for participation (N=348). Twenty-nine out of the 348 died before they could be asked to participate. During recruitment, 66 (or their next of kin) of the remaining 319 declined home visits. These 66 were more likely to be younger ($P = 0.008$), married ($P < 0.001$) and to live in ordinary housing ($P < 0.001$). There were no gender differences compared to the studied sample, either in total, or in the three age groups. The final sample studied consisted of 253 participants, 79.3 per cent of the

319 who were asked to participate. The present study consisted of 163 subjects, whose cognitive function, measured by the Mini-Mental State Examination (MMSE) screening function (Folstein, Folstein & McHugh 1975) was above 19 points out of 30. Subjects with only slightly impaired cognition and subjects with rather intact cognition were assumed to be most likely to understand the questions. 41 out of 163 participants, 25 per cent, lived in institutions including service houses care, skilled nursing homes and group dwellings. Assessments were performed during two or three home visits performed by one of four different investigators (two medical students, one nurse and one physiotherapist). All assessments, questions and scales were interviewer administrated and conducted in the same order for all visits.

Measures

Social capital

Social networks, social integration and attachment were designed to measure the structural component of social capital whereas trust and confidence the cognitive component of social capital. Social networks in this study were used to measure family ties or strong ties to other people (Granovetter 1973). Social integration, in turn, taps into what Putnam (2000) calls bonding relationships, whereas attachment reflects strong ties outside and/or within the family (Granovetter 1973). Social networks, social integration and attachment measure behaviour on the individual level, whereas confidence and trust measure individual attitudes, according to the Macinko and Starfield (2001) classification.

Social networks. Respondents were asked about the quality and quantity of their social relationships. Specifically, quantity assessed whether the respondents had living children and siblings. Quality assessed whether respondents had a close friend or family to talk to if needed (yes or no).

Social integration and attachment was assessed using the Revised Social Provision Scale (Cutrona & Russell 1987). The scale was originally developed to assess the four relational provisions identified by Weiss (1973). In this study, two of the provisions were used as two separate

scales: social integration and attachment. According to Weiss (1973), *social integration* is provided by membership in a network of people with similar interests, whereas *attachment* results from relationships that provides emotional security and safety. Social integration and attachment were each assessed by four items, two worded positively and two negatively. Responses were made on a four-point Likert scale ranging from “strongly disagree” to “strongly agree”. For scoring purposes, the negative items were reversed and summed together with the positive score to form a score for social integration and attachment (see Appendix One).

Confidence in care-giving institutions. Six questions investigated confidence in care-giving institutions. Respondents were asked about their attitudes towards different institutions, such as home-help service, service houses, health center, nursing homes, facilities for the elderly and medical care. Responses were made on a five-point scale ranging from “very negative” to “very positive”.

Trust. The single statement “I trust in people” assessed trust. Responses were made on a five-point scale ranging from “almost not at all” to “almost completely”.

Three dimensions of health

We included three measures of health in this study: self-rated health, depressive symptoms and functional ability. These are three important domains of health measures for older people (Smith et al. 2002; Lundberg & Manderbacka 1996), and all three have been shown to have significant social capital outcomes among the adult population (e.g., Kawachi et al. 1999; McCulloch 2001). Functional ability was measured by the Personal and Instrumental Activities of Daily Living index (P-ADL/I-ADL; Katz et al. 1963; Sonn & Hulter Åsberg 1991). Psychological health was measured by the Geriatric Depression Scale (GDS; Sheik & Yesavage 1986) and self-rated health by asking the respondents to grade their general health status. Self-rated health has frequently been used as a proxy for measuring other aspects of physical and psychological health (Manderbacka 1998). The strong association between depression and disability has repeatedly been shown in different studies (Berkman et al. 1986; Ormel et al. 2002).

Functional ability was studied by means of a cumulative scale containing six personal activities of daily living and four instrumental activities of daily living assessed functional health status. The six personal activities of daily living (Katz Index of ADL; Katz et al. 1963) were based on an evaluation of the functional independence or dependence of the individual with regard to following variables: bathing, dressing, going to the toilet, transfer, continence and feeding. The item of continence was excluded from the present study for two reasons. First, continence may be regarded as a physiological function rather than an activity and secondly, to avoid systematical errors in the cumulative activity scale (see Sonn & Hulter Åsberg 1991). Instrumental Activities for daily living (I-ADL) were based on an evaluation of the functional independence or dependence with regard to four variables: cleaning, food shopping, transportation and cooking (Sonn & Hulter Åsberg 1991). Scores of the personal and instrumental activities on the daily living scale ranged from 0 (not dependent in any activities) to 9 (dependent in all activities).

Self-rated health status was measured by responding to the question "In general, would you say your health is excellent, very good, good, fair or poor?". This variable contained five categories, where 1 is the category with the highest health status.

Depressive symptoms were assessed by a 15-item Geriatric Depression Scale (GDS-15; Sheikh & Yesavage 1986), a questionnaire especially developed as a screening instrument for depression in elderly populations. The subjects describe their feelings towards 15 statements such as "Do you feel your life is empty" and "Are you in good spirits mostly?" using a yes/no format. Scores on the GDS ranged from 0 (no depressive symptoms) to 15 (severe depressive symptoms). The cut-off point for depression is 5 (Sheikh & Yesavage 1986).

The following *sociodemographic variables* were examined: gender and age (as of the 2000 interview), marital status (married/cohabiting, never married, divorced or widowed), housing (house/apartment, service house, nursing home or group dwelling) and living circumstances (living together with someone or living alone).

Analysis

Factor analysis (using principal component analysis) with Varimax rotation was employed here in an attempt to determine whether the constructs of social network, social integration, attachment, confidence and trust assessed the two underlying and related dimensions of social capital. Factor analysis is a variable reduction procedure that allows one to explore the interrelationships between variables in a data set. Factor loadings represent the degree of correlation between the variables and a factor. Values range from -1 to +1, with a larger absolute value indicating a stronger contribution of a variable to that factor. Variables that share positive factor loadings all relate to each other in the same direction. A prevalence percentage for social capital was calculated for gender, age group, marital status, housing condition and living circumstances.

Inter-correlations between three dependent variables, self-rated health, GDS and I-ADL/P-ADL, were calculated using Spearman's correlation coefficients. A multivariate analysis of variance (MANOVA) was used to examine the main and interaction effect between gender and age and social capital with the dependent health variables. MANOVA was chosen since it can evaluate multiple mean differences between groups while maintaining the type I error rate constant at 0.05. Multivariate results are reported using Wilk's Lambda, a standard multivariate test statistic. One-way analyses of variance (ANOVA) were performed on the significant main effects, followed by Tukey's Honestly Significantly Different (HSD) testing.

Results

Description of the Sample and Study Variable

More than two thirds were women and 48 per cent of the subjects were in the youngest age category. The majority of the sample (75%) lived in a house or apartment, whereas 23 per cent lived in service houses. Only a few people lived in skilled nursing homes or in group dwellings. Most of the oldest old were widowed (80%) and lived alone (85%).

Table 1 shows the distribution of the health variables for men and women and three age groups. The total self-rated mean scores of 3.4 fell between the response categories “good” (3) and “fair” (4). Most subjects had no depressive symptoms and were independent in all activities or dependent in one or several instrumental activities. Women rated their health worse than men. The health status decreased with increasing age. An exception to this generalization could be found on self-rated health for the age group 95+.

Table 1. Distribution (mean ± SD) of the health variables: self-rated health, GDS and I-ADL/P-ADL

	Range	85-year-olds (N=66)	90-year-olds (N=48)	95+-year-olds (N=41)	Men (N=41)	Women (N=95)	Total (N=136)
Self-rated health	1-5	3.4 ± 0.9	3.5 ± 0.8	3.0 ± 1.1	3.2 ± 0.8	3.5 ± 0.9	3.4 ± 0.9
GDS	1-10	3.4 ± 2.1	3.8 ± 2.2	4.1 ± 2.4	3.2 ± 2.0	3.8 ± 2.3	3.6 ± 2.2
I-ADL/ P-ADL	0-9	1.6 ± 1.8	2.3 ± 1.8	3.3 ± 2.0	2.0 ± 1.9	2.2 ± 1.9	2.1 ± 1.9

Social capital factor

Inter-item correlations (Cronbach’s α) were carried out between the original items within each of the four domains: social networks, social integration, attachment and confidence in care-giving institutions. The four summary variables were created by calculating the mean score of items within each domain. The initial step in the factor analysis was to compute a correlation matrix to assess whether factor analysis could be usefully carried out including the summary variables social networks (N=163), social integration (N=147), attachment (N=148, confidence (N=143) and the single item trust (N=96). The matrix showed (Table 2) that neither trust nor confidence significantly correlated with any of the other items. They were therefore excluded from the final model.

One factor with an eigenvalue greater than 1.0 emerged from the factor analysis when social networks, social integration and attachment were included in the model. The Varimax rotated factor accounted for 55 per cent of the total variance. Cronbach’s α reliability coefficient of the index was 0.6901, an acceptable level of internal consistency. In Table 3,

Table 2. Correlations between social networks, social integration, attachment, confidence and trust

Social capital dimensions	Correlations			
	2.	3.	4.	5.
1. Social networks	0.3*	0.22*	0.11	0.07
2. Social integration	-	0.46*	0.10	0.08
3. Attachment	-	-	0.12	0.12
4. Confidence	-	-	-	0.12
5. Trust	-	-	-	-

* $p < 0.01$.

the factor loadings and the correlations between the three social capital dimensions are given.

As can be seen in Table 3, social integration and attachment have particularly high factor loadings. Correlations between social networks, social integration and attachment were moderate (0.22–0.46). Hence, these three dimensions were identified as sharing a common underlying factor, which in further analyses is referred to as social capital. Next, the social capital factor was categorized as low (25%), medium (50%) or high (25%) using the inter-quartile as the cut-off point. In Table 4, the distribution of social capital is presented for men and women, age group, marital status, housing and living circumstances.

Table 3. Factor loadings and correlations of the three social capital dimensions

Social capital dimensions	Factor loadings	Correlations	
		2.	3.
1. Social networks	0.63	0.3*	0.22*
2. Social integration	0.82	-	0.46*
3. Attachment	0.78	-	-

* $p < 0.01$.

Table 4. Distribution (%) of social capital by gender, age group, marital status, housing and living circumstances

	Low social capital	Medium social capital	High social capital
<i>Gender</i>			
Men (N=42)	26	55	19
Women (N=105)	24	52	24
<i>Age groups</i>			
85 (N=70)	17	54	27
90 (N=52)	27	56	17
95+ (N=55)	36	44	20
<i>Marital status</i>			
Married/cohabiting (N=19)	16	79	5
Widowed (N=118)	26	47	27
Divorced/never married (N=10)	20	80	0
<i>Housing</i>			
House/apartment (N=111)	21	52	27
Service house/nursing home/group dwelling (N=36)	36	56	8
<i>Living circumstances</i>			
Together with someone (N=21)	10	81	9
Alone (N=126)	27	48	25

The social capital distribution differed along the sociodemographic lines. More women, subjects in the age group 85 and those living in a house or apartment belonged to the high social capital group. The distribution of social capital with marital status and living circumstances revealed that

being married or living together with someone did not automatically result in high prevalence of social capital.

Structural social capital and health

To address the research question examining the relationship between social capital and health, a multivariate analysis of variance (MANOVA) was run. First, inter-correlations between the dependent variables self-rated health, GDS and I-ADL/P-ADL were calculated using Spearman's correlation coefficients (Table 5).

The results revealed that there was a statistically significantly inter-correlation between the health variables, which supports the use of MANOVA to test the association between social capital and health.

Age and gender play central roles in health issues (Arber & Ginn 1993). Therefore the MANOVA was run with social capital, age (age groups 85, 90, 95+) and gender as independent variables and self-rated health, GDS and I-ADL/P-ADL as dependent variables without covariates. The multivariate F was significant for the main effect of age (Wilk's lambda $F(6, 226) = 2.406, p = 0.028$) and social capital (Wilk's lambda $F(6, 226) = 3.426, p = 0.003$), but not for the main effect of gender (Wilk's lambda $F(3, 113) = 2.589, p = 0.056$). No interaction between the independent variables was significant. Having established the overall multivariate significance of this model, each dependent measure was submitted to a univariate analysis of variance (ANOVA) to determine its individual contribution to the multivariate significance.

Table 5. Correlations between all predictors, N=136

	GDS	I-ADL/P-ADL
Self-rated health	0.43**	0.16*
GDS	-	0.18*
I-ADL/P-ADL	-	-

* $p < 0.05$, ** $p < 0.001$.

A series of univariate F tests revealed that age was associated with I-ADL/P-ADL, and social capital with GDS (Table 6).

As can be seen in Table 6, age was a significant variable for functional ability. Tukey's HSD tests revealed that there was a significant

Table 6. Univariate ANOVAs of self-rated health, GDS and I-ADL/P-ADL by age and social capital

	SS	df	F	p
<i>Self-rated health</i>				
Age	1.11	2	0.69	0.51
Social capital	5.11	2	3.19	0.06
<i>GDS</i>				
Age	6.55	2	0.80	0.46
Social capital	63.45	2	7.69	0.00
<i>I-ADL/P-ADL</i>				
Age	43.12	2	6.64	0.00
Social capital	4.94	2	0.76	0.47

difference in P-ADL/I-ADL between the youngest and oldest age group (M 85 = 1.83 versus M 95+ = 2.37). Social capital was a significant variable for GDS, which was also illustrated in Table 6. Post hoc analysis using Tukey's HSD test showed that there was a significant difference in GDS between the low, medium and high social capital groups. (M low social capital = 4.58, M medium social capital = 3.56, M high social capital = 2.70).

Discussion

Our initial objective was to examine the relationship between social capital and health in the oldest old. The results lend some support to the view that the structural component of social capital measured on an individual level is associated with depressive symptoms, but not with self-rated health or functional ability. The association of social capital with multiple health measures was tested with multivariate and univariate analysis of variance (MANOVA, ANOVA). MANOVA tests the effect of social capital on the mean scores of the combined distribution of the outcome variable, which means that three health variables were examined simultaneously. In the ANOVA analysis, age was associated with functional ability and social capital with depressive symptoms.

Social capital in the oldest old

Since the Umeå 85+ study was not originally designed to measure social capital, we had to construct a social capital factor to be used in the analysis. We included in this study structural components such as social networks, attachment and social integration as well as cognitive components such as confidence in care-giving institutions and trust measured on an individual level (Macinko & Starfield 2001). Trust and confidence, the cognitive aspect of the concept did not fit in the final-factor model.

A common assumption is that the cognitive aspect of social capital, such as trust and confidence, is a part of the concept, although different approaches have been established (Fukuyama 1999; Woolcock 2001). Fukuyama (1999) sees trust as a key by-product of social capital and not as a central part of the concept, whereas Woolcock (2001) refers to social capital as networks and norms that facilitate collective action and trust as an outcome. This would indicate that the structural and cognitive components of social capital do not always go together, which may explain our finding.

It is generally assumed that social capital indicators measure the same thing in different groups and places. However, research has demonstrated that there are marked differences in the questions about social capital that are considered appropriate for various groups depending, for instance, on the subjects' age (Cattell & Herring 2002). Traditionally social capital measures like membership in organizations and civic engagement are likely to diminish with increasing age and decreasing functional status (Bukov, Maas & Lampert 2002; Strain et al. 2002). The cognitive aspect of the concept, such as trust and confidence, may take different forms for the oldest old than for a less dependent and vulnerable age group (Mechanic & Meyer 2000). It is apparent that these types of questions are context related. Networks, support and trust are important with a decreasing health status, although the interaction may take a different form from younger age groups, especially when we note that the oldest old usually have lost their spouses and most of their friends in the same age group. For the oldest old, the structural aspect of social capital probably reflects current living conditions, while trust and confidence reflect attitudes and individual traits often acquired decades ear

lier, which would support the idea of social networks and trust as separate parts of social capital.

Since social capital is produced and maintained through contacts with others (Putnam 1993), we may hypothesize that social capital was generated in earlier years and the oldest old benefit from the return of social capital during their old age. We have to consider that we are studying a selected group, "the survivors". Due to prior selection, the older persons in this study have already been affected by social capital, which may explain the distribution of social capital by marital status and living circumstances in Table 4. For the oldest old, the influence of those widowed or living alone on social capital may be different from younger age groups. Consequently, this would indicate the need for a different approach when measuring social capital in the oldest old. To compare social capital with younger age groups or to investigate one's cohort and the social history through which they have lived is thus crucial for measuring social capital in a selected age group who, in a way, have aged successfully.

Social capital as a health resource

In this study we used different dimensions of self-reported health. In previous research, social capital has been associated with self-rated health, functional ability and psychological health (Hyypä & Mäki 2001; Kawachi, Kennedy & Glass 1999; Rose 2000; McCulloch 2001). Of these three health measures, self-rated health is the most commonly assessed in health research since it measures overall health including functional and psychological health (Manderbacka 1998). Social capital and multiple measures of health research have provided evidence that social capital has different effect by the indicator of health (Lindström 2004; Pollack & Knesebeck 2004). This indicates that the mechanism between social capital and health may vary with respect to different states of health, which is an important notion with regard to health improving policies.

Structural social capital was found to contribute to depressive symptoms, which is consistent with previous research (McCulloch 2001). Unsurprisingly, structural social capital, including social networks, plays a significant role in psychological health. Studies have shown that individuals with strong social ties and networks are in better psychological

health (Dean, Kolody & Wood 1990; Grundy & Sloggett 2003), and that psychosocial stress factors like rare contact with one's family may affect the development of depression among the oldest old (Päivärinta et al. 1999). Our findings in this study showed that particularly people living in institutions belonged to the medium or low social capital group (Table 4). They experience a decreased network, are less socially integrated and are less attached to another person, which could put them at greater risk to develop depression.

An unexpected finding was the non-significant association between social capital and self-rated health. If we regard self-rated health as a measure of overall health, it would be logical to assume that social capital would relate to depressive symptoms as well as to self-rated health. One reason why this may not be the case for people in the oldest old age range is that research has revealed that older people self-rated their health more positively than objective evidence would suggest (Johnson & Wolinsky 1993; Leinonen, Heikkinen & Jylhä 2001). The Geriatric Depression Scale (GDS) in turn, which we used as a measure for current depressive symptoms, has been proven to be a reliable and valid scale for elderly people with regard to diagnosed depression (Yesavage et al. 1983). This would indicate the importance in using several health measures in research among older people in order to create a comprehensive picture of their health status (Smith et al. 2002).

Quite unexpectedly, gender was not associated with different health outcomes. Only age was significantly associated with functional ability, which is well known in this age group (e.g. Harris et al. 1989). One reason why age had no indirect or direct relation to depressive symptoms may be due to the restricted age range of the sample. Comparisons with the young old might show increased psychological ill-health with advancing age (Kessler et al. 1992). Another plausible reason may be the use of antidepressants among the participants (von Heideken Wågert et al. 2006). Previous studies on the total sample showed high prevalence, especially in the age group 90-year-olds, of those prescribed antidepressants.

It is important to address two limitations of this research. First, this study was cross-sectional and confined to one point in time, thus we have no information about causal relationship between social capital and health. A decline in social capital may not only be a predictor of deterio

ration in health, it may also be a consequence of deterioration in health. Secondly, while the sample consisted of the oldest old whose MMSE screening points were above 19, the generalizability of our finding to older people in general might be limited. We excluded the severely cognitive impaired, which meant more than one third of the study sample from the analysis to receive higher reliability.

Conclusion

The new feature this paper has brought to light is an understanding of the relevance of individual social capital as a resource in the oldest old. Based on our findings, we conclude that structural social capital, i.e. social networks, social integration and attachment, is a relevant resource for the oldest old, especially with regard to depressive symptoms, but a different approach when measuring social capital for this age group has been suggested. The oldest old may have had a high level of social capital, but our study cannot identify this statistically. Conducting a longitudinal study or including retrospective questions about the subjects' life history, despite the risk of a lower reliability would be a fruitful line for future research, as well as including multiple levels of social capital. Clearly, more comprehensive research with a focus on social capital is needed to capture the meaning and outcome of social capital in the life stage of the oldest old.

Acknowledgement

This research was supported by grants from the Research Institute of the Åbo Akademi University, the Vårdal Foundation, and the Elderly People in the Bothnia-Region project.

Appendix

The four statements assessing *social integration*:

I feel I am part of a group of people who share my attitudes and beliefs.
There are people who enjoy the same social activities as I do.

There is no one who shares my interests and concerns.
There is no one who likes to do the things I do.

The four statements assessing *attachment*:

I have close relationships that provide me with a sense of emotional security and well being.

I feel a strong emotional bond with at least one other person.

I feel that I do not have close personal relationships with other people.

I lack intimacy with any other person.

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