Does Social Activity Decrease Risk for Institutionalization and Mortality in Older People?

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Objectives. Social inactivity predicts adverse health events, but less is known about how different dimensions of social activity are related to health. The aim of this study was to investigate collective (e.g., cultural and organizational activities) and productive (e.g., helping others) social activity as predictors of risk for mortality and institutionalization in old age.

Method. A total of 1,181 community-living people aged 65–84 years at baseline were interviewed face to face as part of the Evergreen project, in Jyväskylä, Finland in 1988. Time to institutionalization and mortality were analyzed in separate models for proportional hazard regression on mortality and competing risks analysis on institutionalization and mortality.

Results. At follow-up, approximately 17 years later, 22% of persons were institutionalized and 71% had died. When sociodemographics, health, functioning, and intensity of physical activity were controlled for, collective social activity reduced risk for mortality and initially for institutionalization although this latter effect diminished over time.

Discussion. Collective social activity may be associated with a reduced risk for mortality and institutionalization in older people. Further studies on the mechanisms underlying the association between social activity and health are needed.

Key Words: Institutionalization—Mortality—Older people—Social activity.
sharing experiences (Mannell & Kleiber, 1997), and function as a source of emotional support. Receiving emotional support and not feeling oneself as lonely have been found to increase mortality risk (Penninx et al., 1997). Mattering to others may decrease depressive symptoms (Taylor & Turner, 2001), which have been found to be associated with risk for institutionalization (Miller & Weissert, 2000) and mortality in old age (Almeida, Alfonso, Hankey, & Flicker, 2010; Sun, Schooling, Chan, Ho, & Lam, 2011).

Productive social activity may be seen mostly to satisfy the need of behavioral confirmation, which is achieved by relationships that give one the feeling of doing good things, doing things well, being a good person, being useful, contributing to a common goal, and being part of a functional group (Steverink & Lindenberg, 2006). Productive activity may also generate reassurance of worth and give an opportunity for nurturance (Weiss, 1973). Reassurance of worth refers to a sense of competence and esteem, and the opportunity to nurturance refers to being responsible for care of others. Greater feelings of usefulness and mastery are associated with lower mortality risk in older adults (Gruenewald, Karlamangla, Greendale, Singer, & Seeman, 2007, 2009; Penninx et al., 1997). Self-efficacy may prevent worsening of functional ability (Mendes de Leon, Seeman, Baker, Richardson, & Tinetti, 1996), which in turn is a risk factor for institutionalization and mortality (Miller & Weissert, 2000).

In all, we expected that collective and productive social activities represent different dimensions of social activity because the resources people give when participating in these activities, their orientation toward them, and the needs met by participation in them differ. Furthermore, we expected that collective and productive social activities are associated with risk for health outcomes such as mortality and institutionalization. However, the effect of these two dimensions of social activity on health outcomes may vary because the different social needs these activities satisfy may affect the risk through distinct pathways.

The objectives of this study were to examine the association (a) between collective and productive social activity and mortality over a follow-up period of 17 years and (b) between collective and productive social activity and institutionalization over a follow-up period of 16 years, in 65- to 84-year-old Finnish people.

Method

Study Population and Data Collection

Data were gathered as part of a multidisciplinary, longitudinal research program, the Evergreen project, the aim of which is to study the health and functional capacity of older residents in the city of Jyväskylä, Finland (Heikkinen, 1998). The population in the study consisted of people born in 1904–1923, who were residents of Jyväskylä on February 1, 1988. Of this group, 1,600 persons were randomly sampled for recruitment into the study with oversampling of those aged 75 years or older at baseline. Of these people, 74 persons were excluded (36 persons had died between the sampling and beginning of the baseline study, 33 had been placed in a nursing home or hospital before the interview, and 5 had moved). A total of 1,224 people took part in the baseline interview. Among the nonrespondents (n = 302), reasons for refusing included unwillingness to participate in the study (n = 158), health problems (n = 57), and other reasons (n = 60) or that the person was not reached (n = 27). We excluded from all analyses 21 persons who had died during 1988, less than 1 year from the baseline, and another 21 persons who had a large amount of missing data in their baseline questionnaire. Thus, our analyses were based on 1,181 individuals. Of this number, 62% had complete data on the baseline variables. Among the 38% of the study participants with missing baseline values, the mean of the portion of missing values was 13%. All participants had complete data on follow-up of vital status and institutionalization.

Measures

Outcome data.—In Finland, long-term care is carried out in health centre inpatient wards and nursing homes. A participant was classified as institutionalized if he/she had officially been deemed in need of long-term care; this decision is usually made when the period of care has lasted at least 3 months and it needs to be continued. Of those officially deemed in need of long-term care, a few may recover and be discharged later but most remain institutionalized for the rest of their lives. Data on long-term care decisions were drawn from the local registers of health care centers and nursing homes. Time to the long-term care decision was calculated as the number of days from the baseline interview date to either the date of the long-term care decision, the date of death, or the end of the follow-up period (December 31, 2004). Dates of death obtained from the population register included all the deaths that occurred between January 1988 and February 2005. Survival time was calculated as the number of days from the baseline interview date to either the date of death or the end of the follow-up period (February 8, 2005). Survival times were censored at the end of follow-up.

Social activity.—Social activities were queried at baseline in a structured interview. Based on the theoretical conceptualization outlined in the introduction and its confirmation by exploratory factor analysis, we divided social activity into collective and productive social activities (Table 1). To formulate collective social activity, variable participants were asked about their involvement in different kinds of hobbies, such as cultural hobbies (visiting the theatre, going
to concerts or movies, etc.), artistic hobbies (singing in a choir, playing a musical instrument, painting, etc.), acting in organizations, congregational activities, and studying. The response options were regularly, occasionally, or not at all. For dancing, the frequency of participation was categorized as at least once a month, less than once a month, or not at all. For physical activity pursued in group, the frequency of participation was categorized as at least once a week, once or twice a month or less, or not at all. For domestic and foreign travel, the response options were few times a year, once a year or less, or not at all. Overall participation was the sum score of all nine activities. To formulate productive social activity variable, the participants were asked about giving help to relatives, friends, or neighbors in cooking, shopping, child caring, cleaning, going for a walk, washing clothes, going to the bank or post office, or in some other way. Frequency of helping in the abovementioned activities was categorized as at least once a month, less than once a month, or not at all. We calculated a composite measure of productive social activity in the same way as for collective social activity. The activities with less clear loading pattern in the social activity factors included in the sum score on the basis of conceptual relevance.

Adjusting covariates included age, full-time education (in years), perceived economic situation (a 5-point scale from very good to very poor), and marital status (married or cohabiting vs single, widowed, divorced). Sex was taken into account by allowing baseline hazard to vary by sex. Morbidity was assessed according to self-reported physician-diagnosed chronic diseases lasting more than 3 months. Diseases were classified by a physician afterward according the International Classification of Diseases, Ninth Revision (ICD-9). Serious diseases included ischemic heart disease, cardiac insufficiency, heart infarction, cerebral infarction, and chronic obstructive pulmonary disease (Lyra & Heikkinen, 2006). The ability to perform essential self-care tasks was measured by asking if a person had difficulties in eating, getting in/out of bed, dressing, bathing, and toileting. Mobility was measured by asking about ambulating indoors, outdoors, and climbing stairs. The response options for these were categorized as “yes, without difficulties,” scored 0, “yes, but has difficulties,” scored 1, or “not able/needs somebody to help,” scored 2. Summary measures were computed for self-care and mobility. To measure cognitive functioning, we used the Mini-D test (Erkinjuntti, Laaksonen, Sulkava, Syrjäläinen, & Polo, 1986). The test has been developed for screening dementia, but it can be used to assess essential cognitive functions such as orientation, memory and learning, reasoning, visualization, and problem solving (Takkinnen & Ruoppila, 2001). We used a summary score of the 35 items of the Mini-D test. Larger score indicates better cognitive functioning and the scale maximum is 43. Depressive symptoms were screened using a modified version of Beck’s depression scale, which measures self-rated and experienced depressive symptoms (Lampinen, Heikkinen, Kauppinen, & Heikkinen, 2006). Every item is rated 0–3, with ascending scores indicating greater severity of symptoms. We used a summary score of the scale. Intensity of physical exercise was measured on a 7-point scale from “moving about only minimally to carry out everyday chores” to “engaging in competitive sports several times a week” (Hirvensalo, Lintunen, & Rantanen, 2000). The variable distribution was concentrated at 3 points of the distribution and, hence, it was recategorized as follows: “moving about only minimally to carry out everyday chores,” “light physical activity one to two or several times a week,” and “at least exercise causing breathlessness and sweating one to two times a week.”

### Statistical Analysis

Mann–Whitney U test and Kruskal–Wallis test were used to compare the differences in means of the continuous baseline measurements between nonsurvivors and survivors and noninstitutionalized, deceased, and surviving participants. For the dichotomous variables, we used the chi-square test. For the outcome of time to mortality, we used a proportional hazard regression model for mortality risk (Cox, 1972). Competing risks models (Fine & Gray, 1999) were used to analyze time to institutionalization, which is an extension of the proportional hazards model enabling focus on the subdistribution of risk for institutionalization and treating mortality risk as an adjusting outcome. We built a hierarchical set of models for both outcomes by adding one set of baseline indicators of sociodemographics, psychological, and physiological health and functioning at time to assess whether they might account for possible associations.
between social activity, mortality, and institutionalization. These indicators were selected based on earlier studies. We calculated the relative reduction in risk for regression coefficient, $b_k$, among a total of $p$ regression coefficients as:

$$RRR_k = \exp(b_k) - 1, \quad k = 1, \ldots, p,$$

where $\exp(b_k)$ is the hazard ratio (HR) calculated from the absolute value of the regression coefficient of predictor $k$. We report reduction in risk as a percentage. For both models, we performed checks on the assumption of proportionality of hazards as described in Grambsch and Therneau (1994), and we used their plotting technique based on Schoenfeld residuals to investigate time-dependent effects. We also performed residual checks for the functional form of covariates and influential observations as described in Therneau and Grambsch (2000). In preliminary analyses, we found significant differences in baseline hazards for sex ($p < .001$). However, in the event-time regression models, the effects of covariates were not materially different between the sexes, so that in the main analyses, sex was taken into account by allowing the baseline hazard to vary by sex. Exploratory factor analysis for categorical variables was performed with MPLUS version 5.21 (Munthén & Munthén, 1998–2009), and the other analyses were performed with R version 2.11.0 (R Development Core Team, 2010). We imputed missing values using the multiple imputation (MI) procedure in SAS for Windows, version 9.1.

**RESULTS**

Table 2 presents the baseline data for the whole sample and by institutionalization and vital status. Mean (standard deviation, SD) collective social activity was 4.70 (2.95) and mean productive social activity was 1.48 (2.38). Collective social activity was more common than productive social activity, as only 6% of the participants did not participate in any collective social activity at all, whereas for productive social activity, the corresponding proportion was 55%. Collective and productive social activity correlated slightly ($r = .163$). At the 17-year follow-up, 834 persons (71%) had died. At the 16-year follow-up, 262 persons (22%) were institutionalized and 605 persons (51%) had died without first being institutionalized. Those not institutionalized or deceased during the follow-up time were more active

| Table 2. Proportions and Means (Standard Deviations) of the Baseline Characteristics in Whole Sample and by Vital Status and Institutionalization/Vital Status |
|-----------------|-----------------|-----------------|
| Whole sample    | Deceased in 2005 | Institutionalized or deceased in 2004 |
| $n = 1,181$     | Yes ($n = 834$; 71%) | No ($n = 347$; 29%) |
| Mean [SD]       | Mean [SD]       | Mean [SD]       | p value | Mean [SD]       | Mean [SD]       | p value |
| Age (in years) | 72.9 [5.40] | 74.4 [5.16] | .001 | 75.0 [4.87] | 74.0 [5.27] | .001 |
| Number of serious illnesses | 0.43 [0.61] | 0.50 [0.64] | .001 | 0.43 [0.61] | 0.51 [0.65] | .001 |
| Number of difficulties in self-care | 0.43 [1.03] | 0.51 [1.14] | .001 | 0.63 [1.19] | 0.45 [1.10] | .001 |
| Number of difficulties in mobility | 0.80 [1.22] | 0.99 [1.31] | .001 | 1.00 [1.33] | 0.95 [1.28] | .001 |
| Cognitive functioning | 36.3 [5.23] | 35.5 [5.52] | .001 | 34.6 [5.94] | 36.0 [5.22] | .001 |
| Perceived economic situation | 2.57 [0.72] | 2.59 [0.73] | .104 | 2.58 [0.73] | 2.60 [0.73] | .108 |
| % Women | 65.6 | 63.2 | 71.5 | .007 | 73.7 | 59.7 | .001 |
| Married or cohabitated | 44.6 | 41.8 | 51.3 | .003 | 29.0 | 46.8 | .001 |
| Intensity of physical exercise | Only in everyday chores | 24.5 | 28.5 | 14.7 | .001 | 27.1 | 28.8 | .001 |
| Light physical exercise | 57.7 | 57.3 | 58.8 | .001 | 59.2 | 56.0 | .001 |
| At least exercise causing breathlessness and sweating 1–2 times a week | 19.0 | 14.1 | 26.5 | .001 | 13.7 | 15.2 | .001 |
in participating in collective social and productive social activities, were younger, had longer education, and evaluated different dimensions of their health as good than their counterparts. Mean perceived economic situation was not associated with institutionalization or mortality status at end of follow-up. A slightly larger proportion of the institutionalized participants were women than the overall proportion of women in the entire cohort, and a slightly larger proportion of the deceased participants were men than the overall proportion of men in the entire cohort. People who were married or cohabitating were less likely to have been institutionalized or to have died by the end of the follow-up. Those participating in physical activities were less likely to have been institutionalized or to have died during the follow-up.

The results of the proportional hazard regression analyses revealed that both collective and productive social activities were associated with reduced mortality risk when the model was controlled for age and the baseline hazard was allowed to vary by sex (Model 1, Table 3). A unit increase in collective social activity lowered mortality risk by 8% and productive social activity by 4%. Adjusting the raw model with marital status, education and perceived economic situation (Model 2), indicators of psychological and physiological health (Model 3) or intensity of physical activity (Model 4) did not change the effect of collective social activity on mortality risk. However, productive social activity was no longer a significant predictor of decreased mortality risk after adjusting the model for number of serious illnesses, difficulties in self-care tasks and mobility, cognitive functioning, and depressive symptoms (Models 3 and 5). Collective social activity was related to lower mortality risk even after accounting for all adjusting covariates (Model 5): a unit increase in collective social activity lowered mortality risk by 4%. Because 17 years of follow-up time is a relatively long time, it is reasonable to consider whether the baseline social activity measures have an influence on risk for death throughout the follow-up period. Tests of the proportionality assumption showed that neither the effect of collective (p = .088) nor the effect of productive (p = .342) social activity on mortality risk was time dependent. Thus, we can conclude that influence of collective social activity remains statistically stable over time in the models for mortality risk.

In the initial models, time dependence was not accounted for, and we observed no significant association in any of the hierarchical models (full-model: HR 1.03; 95% confidence intervals [CI] 0.98–1.08) between collective social activity and risk for institutionalization when mortality risk was also taken into account. However, the proportionality test on the influence of collective social activity on institutionalization risk indicated time dependency of the effect (p < .001), and when the interaction of collective social activity with follow-up time was taken into account, collective social activity had a significant main effect on institutionalization risk, but productive social activity, in turn, did not explain the risk for institutionalization. At the beginning of the follow-up (at time 0 days), a unit increase in collective social activity lowered institutionalization risk by 30% when age was controlled for (Model 1, Table 4). In this early follow-up time, collective social activity was associated with risk for institutionalization although other covariates were added into the base model. In the full adjusted model, a unit increase in collective social activity lowered the initial institutionalization risk by 27% (Model 5).

| Table 3. Hierarchical Models of the Association Between Social Activity and 17-year Mortality Risk Among 65- to 84-Year-Old People: Hazard Ratios (HR) and 95% Confidence Intervals (CI; n = 1,181) |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Participation in collective social activities | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| HR (95% CI) | 0.93 (0.91–0.95) | 0.93 (0.91–0.95) | 0.96 (0.93–0.98) | 0.95 (0.92–0.97) | 0.96 (0.94–0.99) |
| Participation in productive social activities | 0.96 (0.93–0.99) | 0.96 (0.93–0.99) | 0.98 (0.95–1.02) | 0.96 (0.94–1.00) | 0.99 (0.95–1.02) |
| Age (in years) | 1.11 (1.10–1.13) | 1.11 (1.09–1.13) | 1.09 (1.08–1.11) | 1.11 (1.09–1.12) | 1.09 (1.08–1.11) |
| Marital status (married vs. no married) | 0.91 (0.78–1.07) | 0.94 (0.80–1.10) | 1.12 (0.96–1.30) | 1.00 (0.90–1.10) | 1.07 (0.97–1.17) |
| Education | 1.04 (0.90–1.21) | 1.22 (1.14–1.30) | 0.97 (0.96–1.09) | 1.23 (1.10–1.37) | 0.97 (0.96–0.98) |
| Perceived economic situation | 1.07 (0.97–1.17) | 1.00 (0.90–1.10) | 1.00 (0.90–1.10) | 1.00 (0.90–1.10) | 1.00 (0.90–1.10) |
| Number of serious illnesses | 1.22 (1.10–1.37) | 1.23 (1.10–1.37) | 1.22 (1.14–1.30) | 1.19 (1.10–1.27) | 1.22 (1.10–1.30) |
| Number of difficulties in self-care | 0.97 (0.90–1.06) | 0.98 (0.90–1.06) | 0.97 (0.96–0.99) | 0.97 (0.96–0.98) | 0.97 (0.96–0.99) |
| Number of difficulties in mobility | 1.00 (0.98–1.03) | 1.00 (0.98–1.02) | 1.00 (0.98–1.03) | 1.00 (0.98–1.02) | 1.00 (0.98–1.03) |
| Cognitive functioning | 1.22 (1.14–1.30) | 1.19 (1.10–1.27) | 1.22 (1.14–1.30) | 1.23 (1.10–1.37) | 1.22 (1.14–1.30) |
| Depressive symptoms | 0.75 (0.64–0.88) | 0.87 (0.73–1.03) | 0.75 (0.64–0.88) | 0.87 (0.73–1.03) | 0.75 (0.64–0.88) |
| Intensity of physical exercise | 0.58 (0.46–0.74) | 0.71 (0.55–0.92) | 0.75 (0.64–0.88) | 0.87 (0.73–1.03) | 0.75 (0.64–0.88) |
| Light physical activity vs. only in everyday chores | 0.58 (0.46–0.74) | 0.71 (0.55–0.92) | 0.75 (0.64–0.88) | 0.87 (0.73–1.03) | 0.75 (0.64–0.88) |
| At least exercise causing breathlessness and sweating | 1–2 times a week vs. only in everyday chores | 0.58 (0.46–0.74) | 0.71 (0.55–0.92) | 0.75 (0.64–0.88) | 0.87 (0.73–1.03) | 0.75 (0.64–0.88) |

Note: HR-estimates significant at the 0.05 significance level are shown in bold typeface.
Discussion

Participation in collective and productive social activities correlated highly with decreased risk for mortality, but part of the association was explained by the better health of the productively socially active participants. Nevertheless, collective social activity correlated with lower risk for mortality even after extensive adjustments for potential confounders. The effect of collective social activity on risk for institutionalization was strongest at the beginning of the study, whereas toward the end of the follow-up period a reverse trend was observed.

Other studies, which to some extent have used comparable measurements of collective social activities, have reported results similar to those of this study. Participation in social activities, that is, church attendance; going to the movies, restaurants, or sport events; travelling; playing cards, games, bingo, or participation in social groups has been found to reduce mortality risk in older people (e.g., Glass et al., 1999). Instead, we did not find an association between productive activity and risk for mortality or institutionalization when health-related factors were taken into account. According to Herzog and colleagues (1998), leisure activities brought about experiences of a social as well as an agentic, competent sense of self, whereas productive activities were primarily related to an agentic self. Thus, leisure activities may have a more important role for health and well-being than productive activities. Productive social activity, in general, may become personally important. However, possibly due to the feelings of social responsibility, providing informal help may result in less social recognition (Li & Ferraro, 2005). Instead, participation in leisure or collective social activities enables a person to maintain a sense of choice and encourages self-determination (Mannell...
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Figure 1. Assessment of time dependence with Schoenfeld-type residuals plotted against time for collective social activity in the competing risks model for institutionalization. The solid black line is a LOESS fit line, horizontal grey line indicates the zero value for the regression coefficient, and the dashed lines refer to the 95% confidence intervals (CI) of the LOESS fit line.

and Kleiber, 1997, 137) more than providing informal help. However, some other studies have shown that providing instrumental support to friends, relatives, and neighbors reduces mortality risk (Brown, Nesse, Vinokur, & Smith, 2003; Sato et al., 2008). In our study, low participation rates in the variables of helping other people may be a primary reason for the nonsignificant finding of productive social activity. Furthermore, giving help to other people captures only part of productive social activity. For example, we did not have information on doing voluntary work that has been found to be associated with lower mortality risk (Harris & Thoresen, 2005; Musick, Herzog, & House, 1999).

There are several potential explanations for the present results. First, it is possible that people who engage in social activities are healthier than those who do not, which may explain their lower risk for institutionalization and mortality. We adjusted our models for long-term illnesses, indicators of daily functioning, depressive symptoms, and cognitive functioning assessed with validated scales. This attenuated the association between productive social activity and mortality, indicating that health indeed explained the association. However, the results for collective social activity did not materially change after adjustments, or after excluding those who died or were institutionalized during the first 2 years after the baseline, or those who had the worst mobility. Consequently, it is unlikely that the better health status of those engaging in collective social activities would wholly explain their lower risk for institutionalization and mortality. It is possible that through various mechanisms, participation in collective social activity may maintain health at a higher level, thus decreasing risk for these adverse health events. Social activity may preserve physical functioning (Buchman et al., 2009), which in turn is associated with decreased risk for mortality (Buchman et al., 2009; Lyra, Leskine, & Heikkinen, 2005) and institutionalization (Miller & Weissert, 2000). Earlier studies have also shown that social activity or social engagement helps to preserve cognitive function (Béland et al., 2005; Glei et al., 2005) and decrease the risk for dementia (Wang, Karp, Winblad, & Frattigioni, 2002), which have been found to be associated with institutionalization and mortality (Miller & Weissert, 2000). Other mechanisms may also be present: earlier studies have shown that social participation may be associated with greater life satisfaction and sense of self-efficacy (Adelmann, 1994). Self-efficacy may prevent worsening of functional ability (Mendes de Leon et al., 1996), which in turn is a risk factor for institutionalization and mortality (Miller & Weissert, 2000). Greater feelings of mastery have also been found to reduce mortality risk in older adults (Penninx et al., 1997).

The change over time from a protective effect to an increased risk factor for institutionalization risk observed for participation in collectively social activities deserves some discussion. In the 1990s, during the follow-up period of this study, the social and health service in Finland underwent structural reform, in favor of outpatient care. The number of recipients of informal care has increased and long-term institutional care has been replaced by sheltered housing with tailored services (The Ministry of Social Affairs and Health, 2006). Most of those in institutional care are in need of continuous care, almost continuous care because of their poor health status. Collective social activity, indicating expansion of active life, can be assumed to be a health-enhancing factor, which may contribute to the compression of morbidity (see Fries, 2000), and thus, delay the need for care till the very end of life. Alternatively, as those who were institutionalized or deceased in this study had worse health status than the surviving individuals; it is conceivable that among those who had meaningful social activities, being obliged to give them up along with deterioration in health may increase the risk for institutionalization.

The strengths of this study are a representative population-based sample of older people living in the community, data gathering through face-to-face interviews, a high response rate (80%), and long follow-up times. Furthermore, in Finland register-based data on deaths and long-term care decisions are reliable with complete coverage. The study was part of a wider multidisciplinary research project, and hence, we were able to adjust our models for several important and interesting variables. A potential limitation of this study is that self-reports of diseases are prone to recall bias, particularly in illnesses perceived as non-threatening and not affecting daily functioning. These illnesses may nevertheless increase the risk for deterioration in health. However, we do not believe that we have substantially underestimated the disease burden at baseline because we were able to adjust our models for physical activities of daily life, mobility, depressive symptoms, and cognitive...
functioning in addition to self-reported physician-diagnosed diseases. Another potential important limitation is that there may be other meaningful social activities not captured in our interview, such as informal social gatherings and volunteering. In particular, the effect of productive social activity on health indicators needs further study with more appropriate measures. As noted in the introduction, the distinction between the two forms of social activity is problematic because these dimensions are not clearly separable. The third potential limitation is that our analysis is based on the data that were collected in the late 1980s. Consequently, some of the study items may not be consistent with current knowledge on the topic. For participation in collective social activities, we were not able to differentiate whether the person who responded “yes” did the activity alone or in a group. However, we can be fairly sure that, for example, going to cultural events, singing, practicing visual art, or studying is for many older persons carried out in a social context. Community music and art classes are highly developed in Finland, and for example, the Third Age University has been an important actor in old age education in Finland and especially in Jyväskylä. Inclusion of these activities in the variable describing collective social activity may have caused some measurement error, but leaving these out would definitely have led to underestimation of participation in collective social activities.

The study broadens understanding of collective and productive social activity and their relation to two major outcome variables describing age-related health events. We have produced new knowledge on the association of social activities and risk for institutionalization. The results concerning collective social activity and mortality can be generalized to community-dwelling older people. Although social networks are contextually bound, meaning that the characteristics of networks associated with the well-being of older people may differ in different regional settings (Litwin, 2010), the phenomenon of social activity as a contributor to the health of older people can be viewed as alike everywhere (see Holt-Lunstad, Smith, & Layton, 2010; Seeman, 2000). However, the results concerning institutionalization may be more contextually bound because health care systems are different in different countries. Placing the elderly population in long-term care has traditionally been more common in Finland and the other Nordic countries than, for example, in Southern Europe or East Asia, where reliance on the family as the care provider has thus far been the norm.

**Conclusion**

Collective social activity may be associated with a reduced risk for mortality and institutionalization, indicating that promoting social activity can maintain and enhance health in old age. Socially inactive older people form a risk group, and hence there is need to create more opportunities for them to engage in social activity. More research on the factors mediating social activity and health is needed in order to achieve a deeper understanding on the phenomenon.

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**Author Contributions**

K. Pynnönen: Conception and design, drafting the manuscript, acquiring the funding for conducting the research. T. Tormäkangas: Contribution to the design of the study, data analysis, critical revision for important intellectual content. R.-L. Heikkinen: designing the measurements of social activity, critical revision for important intellectual content. T. Rantanen: Critical revision for important intellectual content. T.-M. Lyra: Contribution to the design of the study, acquiring the funding for conducting the research and critical revision for important intellectual content.

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