Trajectories of social activities from middle age to old age and late-life disability: a 36-year follow-up

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Abstract

Objectives: to examine the association between 34-year trajectories of social activity, from middle age to old age and late-life disability.

Methods: data from the Swedish Level of Living Survey (LNU) and the Swedish Panel Study of the Oldest Old (SWEOLD) were used. LNU data from 1968, 1981, 1991 and 2000 were merged with SWEOLD data from 1992, 2002 and 2004 to create a longitudinal data set with five observation periods. Trajectories of social activities covered 1968–2002, and late-life disability was measured in 2004. The sample consisted of 729 individuals aged 33–61 at baseline (1968), who participated in at least four observation periods and who were free from mobility limitations at baseline. Four trajectories of social activity were identified and used as predictors of late-life disability.

Results: reporting low/medium levels of social activity from mid-life to old age was the most common trajectory group. Persons reporting continuously low/medium or decreasing levels of social activity had higher odds ratios for late-life disability (OR = 2.33 and OR = 2.15, respectively) compared with those having continuously high levels of activity, even when adjusting for age, sex and mobility limitations, and excluding persons with baseline mobility limitations.

Conclusions: results suggest that the disability risk associated with social activities is related to recent levels of activity, but also that risk may accumulate over time, as indicated by the higher disability risk associated with the continuously low/medium level social activity trajectory.

Keywords: social activity, trajectories, disability, ageing, mid-life, older people
Introduction

Numerous studies have investigated the health benefits of social engagement and have repeatedly shown that persons with greater social engagement not only live longer, but also have a lower risk of health problems [1, 2]. One health outcome that has been the focal point of several recent studies on the health benefits of social engagement among older adults is physical disability [3–5]. Most of these studies contend that being socially engaged during old age can help to forestall the onset of physical disability. Explanations for this association typically emphasise the emotional well-being (e.g. through satisfactory social support) and physical activity that come with an active social life [3]. However, as individuals grow older and health problems become more common, maintaining a socially active life becomes increasingly difficult [6], suggesting a reciprocal association between social engagement and disability [7, 8].

Still, important questions remain about the potential effects of social engagement on disability among older adults. One such question focuses on whether the disability risk associated with social engagement builds over time, or whether it is only one’s recent level of engagement that is associated with disability risk. Prior studies on the health effects of social engagement have not tracked older adults’ long-term histories of social engagement, and thus have not been able to determine whether late-life changes in social engagement can alter one’s risk of disability, or whether one’s disability risk is irrevocably linked with patterns of social engagement that began much earlier in the adult life course. In the present study, we address this question by testing the association between long-term trajectories of social engagement—measured among healthy individuals over a 34-year-period, as they transition from mid-life into old age—and late-life disability.

Material and methods

Study sample

This study used data from the Swedish Level of Living Survey (LNU) and the Swedish Panel Study of Living Conditions of the Oldest Old (SWEOLD). LNU is a longitudinal, nationally representative, study of the Swedish population, ages 18–75. It was first carried out in 1968, and subsequently in 1974, 1981, 1991 and 2000 [9]. Persons from the LNU sample who have passed the upper age limit of 75 years were included in the SWEOLD study [10]. SWEOLD has been carried out in 1992, 2002, and 2004. The Karolinska Institute Regional Research Ethics Committee reviewed and approved survey protocols.

In the current study, data from LNU 1968, 1981, 1991 and 2000 were merged with data from SWEOLD 1992, 2002 and 2004. Together, these data sets allow for up to 36 years of follow-up among a subsample of individuals ages 33–61 at baseline (1968). Individuals who were interviewed in 1968, 2000–02 and 2004, and in at least one data collection in-between, were eligible for the study. Persons with mobility problems in 1968 were excluded from the analyses to minimise the effect of health on the trajectories of social activities. Of all 33–61-year-olds interviewed in 1968, 1702 (59%) died during the follow-up, 322 (11%) were non-responders or had internal missing data and 115 (4%) were excluded because of mobility problems in 1968. The final analytic sample consisted of 729 persons.

Measurements

Each individual’s pattern (or trajectory) of social activities over time was identified based on his/her social activities in 1968, 1981, 1991–92 and 2000–02. Social activity was a combined index of four items concerning visiting and being visited by friends and relatives, with responses ‘no’, ‘yes, sometimes’ and ‘yes, often’. For each measurement time, persons reporting no activity for all four items, or ‘sometimes’ to no more than one item were coded 0; persons answering ‘sometimes’ to 2–4 items, but no ‘often’, were coded 1 and persons answering ‘often’ to at least one of the items were coded 2. Four trajectory groups were created. High level of social activity: persons reporting social activity throughout the period, who were coded 2 at least at three time-points. Increased social activity: persons reporting no or low activity (0 or 1) at the earlier time-points but more activity towards the end of follow-up. Decreased social activity: persons reporting activity (1 or 2) at the earlier time-points, but lower or no activity in the latter ones. The increasing and decreasing trajectories focused on changes at the last two points of measurement. Finally, persons with Low/medium level of social activity reported mostly lower levels of social activity without sustained increases over time.

Late-life disability was measured at the follow-up in 2004, with items measuring limitations with activities of daily living (ADL; eating, dressing, toileting, transferring in and out of bed and bathing) and instrumental activities of daily living (IADL; house cleaning, shopping and preparing food). Needing help with any of these activities was defined as being in a state of disability.

Impaired mobility was measured at baseline (1968) with an index of three items: the ability to walk 100 m without difficulties, to run 100 m without difficulties, and to go up and down stairs without difficulties. In 2000–02, the index consisted of two of these items: the ability to walk and to go up and down stairs.

Statistical analyses

Logistic regressions were used to analyse the association between trajectories of social activity covering the period 1968–2000–02 and late-life IADL/ADL disability in 2004. Only individuals free from mobility problems in 1968 were included in the analyses in order to reduce the risk of capturing the effect of health/function on social activity. Age, sex and mobility impairment in 2000–02 were included as control variables.
Results

Many people in this sample had a socially active life as they moved from mid-life into old age. The trajectory group Low/medium level of social activity (38.4%) was the most common, followed by High level of social activity (31.7%; reference category), Decreasing social activity (19.9%) and Increasing social activity (10.0%). Table 1 shows some characteristics of these four trajectory groups. Persons with a trajectory of continuously high levels of social activity were younger, more commonly women and the prevalence of late-life disability was low. In contrast, persons with decreasing and low/medium levels of social activity were older and had higher levels of late-life disability.

Table 2 shows the association between engagement in social activities from mid-life to old age and late-life disability measured 2 years later. The left column of Table 2 shows odds ratios (OR) for the association between the trajectory groups and late-life disability. Compared with those with continuously high levels of social activity, persons with low/medium and decreasing levels of social activity had higher odds of late-life disability. Persons with increasing activity levels did not differ significantly from those with continuously high social activity. After adjusting for age and sex in Model 2, ORs decrease but remain significant. In Model 3, after additionally adjusting for mobility impairment in 2000–02, late-life disability remained more common among those with trajectories of low/medium social activity [OR = 2.33; confidence interval (CI) = 1.38–3.95] and decreasing social activity (OR = 2.15; CI = 1.19–3.87).

Discussion

By tracking social activities within non-impaired individuals over a 34-year-period, the associations found in this study lend support to the idea that one’s level of social activity may influence disability risk [4, 5, 7, 8]. Middle aged individuals with continuously high levels of social interactions over a 34-year-period leading up to old age have a lower risk of late-life disability compared with those having decreasing or continuously low/medium social activity.

More specifically, our results suggest that the disability risk associated with social activities is related to recent levels of activity, but also that it may accumulate over time, as indicated by the higher disability risk associated with the low/medium level social activity trajectory. Maintaining a high level of social activity in the transition into old age may

| Mean age (years) | 40.3 | 42.2 | 41.2 | 44.1 *** |
| Age range | 33–58 | 33–60 | 33–57 | 33–61 |
| Sex | 38.5 | 51.4 | 49.3 | 44.1 * |
| Women | 61.5 | 48.6 | 50.7 | 55.9 |
| Mobility impairment (in 2000–02) | | | | |
| Intact mobility | 76.2 | 65.0 | 74.0 | 56.6 *** |
| Unable to walk or climb stairs | 9.5 | 22.5 | 16.4 | 23.4 |
| Unable to walk and climb stairs | 14.3 | 12.5 | 9.6 | 20.0 |
| Late-life disability (in 2004) | | | | |
| No disability | 84.8 | 70.7 | 86.3 | 64.1 *** |
| Some level of disability | 15.2 | 29.3 | 13.7 | 35.9 |

*P ≤ 0.05.
**P ≤ 0.01.
***P ≤ 0.001.

Table 2. Associations between trajectories of social activity from mid-life into old age and late-life disability, odds ratios (OR) and 95% confidence intervals (CI)

<table>
<thead>
<tr>
<th>Lat-life disability (IADL/ADL) (n = 729)</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td>High level social activity</td>
<td>1.0 (ref)</td>
<td>1.0 (ref)</td>
<td>1.0 (ref)</td>
</tr>
<tr>
<td>Low/medium level social activity</td>
<td>2.32</td>
<td>1.49–3.61</td>
<td>1.97</td>
</tr>
<tr>
<td>Increasing social activity</td>
<td>0.89</td>
<td>0.42–1.90</td>
<td>0.75</td>
</tr>
<tr>
<td>Decreasing social activity</td>
<td>3.13</td>
<td>1.91–5.13</td>
<td>2.03</td>
</tr>
</tbody>
</table>

aAdjusted for age and sex.

bAdjusted for age, sex and mobility impairment in 2000–02.
indicate an intact access to social support as well as a certain level of physical activity. Together these may help postpone late-life disability. As social networks typically decrease with advancing age, older persons that manage to maintain a high level of social activity may be more privileged when it comes to social, personal and economic resources as well as health.

Only persons without mobility limitations at baseline were included in the analyses, to reduce the risk that trajectories of low social activity were affected by mid-life health problems. Late-life mobility impairments were also adjusted for in the analyses, as both increasing and decreasing activity trajectories may be related to health problems that in turn are related to late-life disability. Still, as social activities and health are intrinsically intertwined, the risk of underlying health problems affecting the trajectories of social activity as well as late-life disability cannot be dismissed. As there is no information about prior disability, it may be possible that some individuals became disabled already during the trajectory period.

Furthermore, while the long follow-up-time and the repeated measures of this study make it unique, these factors also increase attrition due to mortality and non-response, resulting in a study sample where healthy survivors are overrepresented. The associations between social activities and disability reported in this study are therefore likely underestimated.

According to the results, facilitating social activities in late-life, as well as in the transition between mid- and late-life, can have beneficial effects and may help to postpone disability.

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**Key points**

- Many people have a socially active life as they move from mid-life into old age.
- Patterns of decreasing, and continuously low/medium, social activity are associated with higher risk of late-life disability.
- Late-life disability risk is related to recent levels of social activity but also seems to accumulate over time.

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**Conflicts of interest**

None declared.

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**References**


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