



Full length article

## Social integration and alcohol consumption among older people: A four-year follow-up of a Swedish national sample

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## ABSTRACT

**Background:** Today's older people drink more alcohol than earlier cohorts of older people. Social integration has been identified as an important factor for older people's drinking, but the association is complex. This study investigates both high and low levels of social integration and their associations with longitudinal patterns of alcohol consumption among older women and men.

**Methods:** Longitudinal nationally representative data of older Swedish women and men aged over 65 – the Swedish Level of Living Survey (LNU) and Swedish Panel Study of Living Conditions of the Oldest Old (SWEOLD) – from 2010/2011 and 2014 (n = 1048). Associations between social contacts and social activities at baseline and longitudinal patterns of drinking frequency were examined with multinomial logistic regression analyses.

**Results:** Men reported drinking alcohol more often than women, but the most common drinking frequency among both women and men was to drink monthly or less. Drinking habits were generally stable over time. People with high levels of social activity at baseline were more likely to have a stable daily or weekly drinking frequency or increased drinking frequency over the four-year follow-up period, particularly women. People with low levels of social contacts and/or social activities were less likely to have a stable daily or weekly drinking frequency, compared to people in the low and stable drinking frequency group.

**Conclusions:** Alcohol consumption is embedded in a social context, older people drink in social situations and social integration predicts continued drinking patterns.

### 1. Introduction

Older people's increasing alcohol consumption has been described as a silent epidemic and a challenge to public health (Wang and Andrade, 2013). Older people drink more alcohol than earlier cohorts, in contrast to younger age groups where the trend is the opposite (e.g., Kelfve et al., 2014; Raninen et al., 2016, 2013, for trends in the Swedish population). More recent cohorts of older people have had more liberal drinking habits throughout their lives and seem to carry these habits with them into older ages (Ahacic et al., 2012). In particular, it has become more common to drink every week (Kelfve et al., 2014; Raninen et al., 2016, 2013). There is an increased interest in the drinking habits of the older population and its potential benefits and harms, but little is known about the contexts and motives of drinking. According to a recent review of qualitative studies investigating reasons for alcohol consumption in the older population (Kelly et al., 2018), social activities and social integration were identified as important reasons and contexts for alcohol consumption. The opposite, drinking to

deal with difficulties such as social isolation and loneliness, was also identified as a reason for alcohol consumption. This study investigates both high and low levels of social integration and their associations with longitudinal patterns of alcohol consumption in the population aged 65 and older.

Drinking is embedded in a social context (Immonen et al., 2011; Kelly et al., 2018). Both high and low levels of social integration are related to higher alcohol consumption among older people. Drinking is a social lubricant related to various forms of social activities (Britton and Bell, 2015; Dare et al., 2014; Graham and Schmidt, 1999), and many older individuals report drinking for fun and celebration (Immonen et al., 2011). Older persons who are married drink more frequently than other groups, although this is largely because older married individuals are younger, more often male, and generally in better health compared to older individuals who are single, divorced or widowed (Graham and Schmidt, 1999). Still, married individuals may drink more because they have someone to drink with on a regular basis and perhaps also have access to a larger social network. Social activities

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also seem to be predictive of drinking habits years later; in a longitudinal study, having more social activities in middle age predicted high-risk alcohol consumption ten years later (Moos et al., 2010b).

At the other end of the social integration continuum, alcohol consumption has also been found to be a way of coping with social isolation and loneliness (Immonen et al., 2011; Kelly et al., 2018). Several studies have found that the divorced and widowed groups are more likely to drink larger quantities of alcohol, particularly men (Graham and Schmidt, 1999; Iparraguirre, 2015; Watt et al., 2014). Also, low social support and less resourceful social networks are associated with a higher risk of harmful or heavy drinking (Iparraguirre, 2015; Kirchner et al., 2007; Shiovitz-Ezra and Litwin, 2012). These findings suggest that both lack of social integration, such as social isolation, and high social integration, such as a rich social network and engagement in social activities, are related to more alcohol consumption.

Drinking habits also differ across socioeconomic groups. More advantaged socioeconomic groups drink more frequently and overall larger amounts than more disadvantaged groups, a trend also found also in older populations (Kelfve et al., 2014). However, the disadvantaged groups suffer more adverse consequences of alcohol consumption (Bellis et al., 2016).

Health is another important factor to consider when investigating alcohol consumption, especially at older ages when many individuals face some kind of health impairment. Better self-rated health is related to moderate drinking and a socially active life in older ages (Hajat et al., 2004), while physical and functional health problems are related to alcohol abstinence as well as decreased drinking (Agahi et al., 2016; Holdsworth et al., 2016). Drinking can also be a way of coping with certain health problems, including psychological distress or depressive symptoms (Hajat et al., 2004).

With regard to gender, alcohol consumption is generally higher among men than women, and older individuals are no exception. However, gender differences are decreasing and older women are “catching up” with older men (Britton et al., 2015; Kelfve et al., 2014). At-risk consumption is more common among older men than among older women (Agahi et al., 2016), perhaps because men self-medicate anxiety and depressive symptoms with alcohol and drugs while women are depressed to a higher extent (Kessler et al., 2003). Other health problems are also more common among older women than among older men (Rieker and Bird, 2005), which in turn affects drinking behavior. Furthermore, the life situations and social integration of older women and men are different. Older women are more likely to be widows than older men, but the health consequences of widowhood seem to be worse for men (Lennartsson and Lundberg, 2007). Women generally have larger social networks and are more socially active (e.g., Dykstra and Fokkema, 2007; Victor et al., 2006), which may explain the gender differences in health consequences. Similar gendered patterns are likely for alcohol consumption.

There is a general lack of longitudinal research on the association between social integration and drinking in old age (Dare et al., 2014). Also, little is known about potential gender differences in the associations between social integration and alcohol consumption in old age. In this study, the aim is to investigate the association between social integration and the longitudinal pattern of drinking frequency among older women and men, taking into account marital status, socioeconomic status, and health indicators that cover a range of health problems.

## 2. Material and methods

### 2.1. Data

This study is based on data from the Swedish Level of Living Survey (LNU) and the Swedish Panel Study of Living Conditions of the Oldest Old (SWEOLD) (Fritzell and Lundberg, 2007; Lennartsson et al., 2014). LNU is a nationally representative longitudinal interview study of the

population aged 18–75 years. It began in 1968 and has been conducted in ten-year intervals, with the latest wave in 2010 ( $n \approx 5300$ ). Individuals from the LNU sample who are older than 75 years are interviewed in SWEOLD. Data collections for SWEOLD have been conducted since 1992, with the latest two data collections in 2011 and 2014 ( $n \approx 900$ –1300). In 2014, the lower age limit was 70 years. This study uses baseline data from LNU 2010 and SWEOLD 2011, ages 66–101, with follow-up data from SWEOLD 2014. Response rates were 75% for LNU 2010 (for the relevant age group; 66–75), 86% for SWEOLD 2011 and 84% for SWEOLD 2014. At baseline (LNU 2010 and SWEOLD 2011), 1567 individuals were interviewed. Of these, 1212 were still alive and included in the sample of SWEOLD 2014, and 1071 were re-interviewed. Due to missing data on individual items, the analytical sample was reduced to 1043 individuals. The regional ethical review board in Stockholm has approved study protocols (registration numbers 2010/403-31/4, 2015/1070-31/5, and 2014/1003-31/5).

### 2.2. Variables

#### 2.2.1. Dependent variables

**2.2.1.1. Drinking frequency.** Drinking frequency was measured by the question “How often do you drink alcoholic beverages such as wine, beer, or spirits?” In LNU 2010 (baseline), response options were Almost every day (5–7 days/week), 2–4 days/week, Once a week, 2–3 times/month, Once a month, 6–11 times/year, More seldom, and Never. In SWEOLD 2011 (baseline) and 2014 (follow-up), response options were Almost every day (5–7 days/week), 3–4 days/week, 1–2 days/week, 2–3 times/month, Once a month, 1–6 times/year, and Never. These categories were grouped into Daily or almost daily, Every week, and Monthly or less.

**2.2.1.2. Change in drinking frequency.** Change in drinking frequency was the outcome measure in the analyses. It was created by combining measures of drinking frequency at baseline and follow-up into four categories: Decreased drinking frequency, Increased drinking frequency, Low and stable drinking frequency (monthly or less, at both occasions), and Stable daily or weekly drinking frequency (daily or almost daily at both occasions, or every week at both occasions). The Low and stable drinking frequency (monthly or less) category was used as the reference group in the analyses.

#### 2.2.2. Independent variables

We investigated two indicators of social integration at baseline: social contacts and social activity.

**2.2.2.1. Social contacts.** Social contacts were measured via four items: visiting relatives, visiting friends, having relatives over to visit, and having friends over to visit. Responses were No (0), Yes, sometimes (1), and Yes, often (2). These were summed into an index of social contacts, ranging 0–8. Those with a score of 0–2, excluding those who answered “Yes, often” to any of the four questions, were categorized as having Low levels of social contacts, those with a score of 7 or 8 were categorized as having High levels of social contacts, and those in-between were categorized as having Moderate levels of social contacts and used as the reference group in the analyses.

**2.2.2.2. Social activities.** Social activities were measured via four items: (1) cultural activities, (2) going to restaurants, (3) going out dancing, and (4) participating in study circles. Responses were No (0), Yes, sometimes (1), and Yes, often (2). These were summed into an index of social activities, ranging 0–8. Those with a score of 0 were categorized as having Low levels of social activity, those with a score of 4–8 were categorized as having High levels of social activity, and those in-between were categorized as having Moderate levels of social activity and used as the reference group in the analyses.

2.2.3. Covariates

All covariates were measured at baseline. Age at time of interview was used. Marital status was categorized as married/cohabiting, widowed, and divorced/unmarried. Household occupational social class, rather than individual, was categorized based on the main former occupation of the respondent or his/her spouse, or, for widows and widowers, the main occupation of the deceased spouse. The highest occupational social class in the household was then used for the household as a whole (Erikson, 1984). It was categorized into two groups: higher and lower social class. People with lower social class were unskilled or skilled manual workers, and farmers and self-employed people without employees. People with higher social class were non-manual workers, academic professionals, and farmers with extensive land and/or employees, and self-employed people with employees. Functional impairment was measured via three questions about the ability to walk 100 m without difficulties (Yes/No), to run 100 m without difficulties (Yes/No), and to go up and down stairs without difficulties (Yes/No). The three items were summed into an index of number of mobility problems, ranging 0-3. Psychological distress was measured with a question about whether the respondent had experienced anxiety or nervousness in the past 12 months. Response options were No, Yes, mild, and Yes, severe. Self-rated health was coded as Good, Neither good or poor, and Poor.

2.3. Statistical analyses

Multinomial regression analyses were performed to examine the association between the two forms of social integration at baseline and the longitudinal patterns of drinking frequency over time. In multinomial regressions, the outcome is a categorical variable that cannot be ordered in a meaningful way, therefore outcome categories are compared to a reference group. In this study the categories Stable daily or weekly drinking frequency, Increased drinking frequency, and Decreased drinking frequency were compared to the reference group Low and stable drinking frequency. Analyses were run separately for women and men, followed by interaction analyses in the full sample to see if gender differences in the associations between social integration and longitudinal patterns of drinking frequency were statistically significant. Stata 14 was used for the analyses.

3. Results

Table 1 presents the descriptive characteristics of the study sample divided by gender. Compared to men, women in the sample were older (mean age 75.7 years compared to 74.0 years), less often married/cohabiting (53.2% compared to 75.4%), and more often widowed (27.8% vs 9.6%). Women also had more psychological distress, both mild and severe problems, more functional impairments, and poorer self-rated health.

With regard to social integration, about ten percent of both women and men were categorized as having low levels of social contacts, while about twenty percent (23.7% of the women and 19.7% of the men) were categorized as having high levels of social contacts. Social activity did not differ between women and men for low levels of activity, 16.8% of the women and 15.2% of the men were categorized as having low levels of social activity. On the other hand, there was a slight difference between women and men in high levels of social activity, with 19.4% of women and 14.7% of men reporting high levels of activity.

As for alcohol consumption and longitudinal patterns of drinking frequency, 38.7% of the women and 51.0% of the men reported drinking alcohol on a daily or weekly basis at baseline. Drinking on a daily or almost daily basis was equally common among women and men at baseline. Gender differences were found for drinking every week, which was more common among men, and drinking monthly or less frequently (or not at all), which was more common among women. At follow-up the proportions drinking on a daily or weekly basis were

**Table 1**  
Descriptive characteristics of the study population by gender, (n = 1043). Weighted.

	Women (n = 572)	Men (n = 471)	Gender differences
Age (mean; SD)	75.7 (7.2)	74.0 (6.4)	***
<b>Marital status</b>			
Married/cohabiting	53.2	75.4	***
Widowed	27.8	9.6	***
Divorced or unmarried	19.0	15.0	ns
<b>Household occupational social class</b>			
Lower social class	31.6	30.8	ns
Higher social class	68.4	69.2	ns
<b>Health</b>			
Psychological distress			
No	77.1	90.1	***
Yes, mild	16.6	7.4	***
Yes, severe	6.4	2.6	**
Functional impairment			
No impairment	33.6	55.4	***
One impairment	32.9	26.3	*
Two impairments	15.7	10.1	**
Three impairments	17.8	8.1	***
Self-rated health			
Good	57.7	65.7	**
Neither good or bad	32.4	28.2	ns
Poor	9.9	6.1	*
<b>Social integration</b>			
Social contacts			
Low levels of social contacts	10.5	9.0	ns
High levels of social contacts	23.7	19.7	ns
Moderate levels of social contact (ref)	65.8	71.4	+
Social activity			
Low levels of social activity	16.8	15.2	ns
High levels of social activity	19.4	14.7	*
Moderate levels of social activity (ref)	63.8	70.2	*
<b>Alcohol consumption</b>			
Drinking frequency at baseline			
Daily or almost daily (5-7 times/week)	6.4	7.2	ns
Every week (1-4 times/week)	32.3	43.9	***
Monthly or less	61.3	49.0	***
Drinking frequency at follow-up			
Daily or almost daily (5-7 times/week)	3.6	8.1	**
Every week (1-4 times/week)	28.2	37.1	**
Monthly or less	68.2	54.8	***
Longitudinal pattern of drinking frequency			
Low and stable drinking frequency (monthly or less)	58.2	41.7	***
Stable daily or weekly drinking frequency	23.1	27.6	ns
Decreased frequency	12.0	14.2	ns
Increased frequency	6.7	16.5	***

+ < 0.10, \* < 0.05, \*\* < 0.01, \*\*\* < 0.001.

lower compared to baseline, 31.8% of the women and 45.2% of the men. Gender differences were statistically significant for all levels of drinking frequency at follow-up, the more frequent ones (daily and weekly drinking) being more common among men, and the less frequent one (monthly or less) more common among women.

The longitudinal pattern of drinking frequency showed that the low and stable drinking pattern (monthly or less at both time-points) was the most common longitudinal pattern among both women and men, but more common among women than men – 58.2% for women compared to 41.7% for men. The stable daily or weekly drinking pattern was the second most common pattern, and did not differ between women and men. Likewise, there was no gender difference in decreased

**Table 2**  
Relative risk ratios (RRR) for the association between social integration factors and changes in drinking frequency among women (n = 572).

		Low and stable drinking frequency (monthly or less) (n = 341)		Decreased drinking frequency (n = 68)		Increased drinking frequency (n = 37)		Stable daily or weekly drinking frequency (n = 126)	
		Model 1		Model 2		Model 1		Model 2	
<b>Social contacts</b>	REF								
Low levels of social contacts		1.80	2.05+	0.27	0.28	0.09*	0.11*		
High levels of social contacts		0.67	0.65	1.55	1.47	1.09	0.98		
<b>Social activity</b>	REF								
Low levels of social activity		0.68	0.67	0.72	0.77	0.30*	0.40+		
High levels of social activity		1.54	1.39	2.91**	2.34+	2.44***	1.84*		

Model 1: adjusted for age and marital status; Model 2: adjusted for age, marital status, household occupational social class, and health indicators + < 0.10, \* < 0.05, \*\* < 0.01, \*\*\* < 0.001.

drinking frequency. However, increased drinking frequency, which was the least common longitudinal pattern among women (6.7%) and second-to-least common longitudinal pattern among men (16.5%), was significantly more common among men than women. Decreased drinking frequency was the least common longitudinal pattern among men.

Tables 2 and 3 present the associations between social contacts, social activity and longitudinal patterns of drinking frequency among women and men, respectively. The first model adjusted for age and marital status, two factors that are related to both social integration and alcohol consumption. The second model additionally adjusted for household occupational social class and health status, which are also related to both social integration and alcohol consumption. Among women, having low levels of social contacts was related to a lower likelihood of having a stable daily or weekly drinking pattern over time, as compared to the reference group, i.e., the group with a low and stable drinking frequency over time (Table 2). In line with these findings, there were also indications that low levels of social contacts were related to a higher likelihood of subsequent decrease in drinking frequency (p < 0.1). There were no significant associations between high levels of social contacts and any of the longitudinal drinking patterns.

Like social contacts, results for social activity suggested that a low level of activity was related to a lower likelihood of a stable daily or weekly drinking pattern over time compared to the reference group (p < 0.1 in Model 2). A high level of social activity on the other hand was related to a higher likelihood of a stable daily or weekly or an increased drinking pattern over time. These results were attenuated when adjusting for socioeconomic status and health indicators in Model 2 (p < 0.1 for two associations), suggesting that differences in socioeconomic status and health partly explain the associations between social integration and longitudinal patterns of drinking frequency that were found in Model 1.

Among men, there were no significant associations between social

contacts and longitudinal patterns of drinking frequency (see Table 3). Findings for social activity suggested that a low level of social activity was related to a lower likelihood of having a stable daily or weekly drinking frequency over time compared to having a low and stable drinking frequency over time, which was the reference group. Results also indicated that low levels of social activity were associated with a lower likelihood of decreased drinking frequency (p < 0.1 in Model 2). Similar to results for women, high levels of social activity were associated with a higher likelihood of a stable daily/weekly drinking pattern over time. The relative risk ratios remained the same in Model 2, but weakened statistically.

In additional analyses (not shown), interactions between gender and social contacts and social activity, respectively, in relation to longitudinal patterns of alcohol consumption were run in order to see if associations between social integration and alcohol consumption were different for women and men. Results showed a significant interaction between gender and low levels of social contacts in the association with longitudinal patterns of alcohol consumption (p = 0.039 in the fully adjusted model). Women with low levels of social contacts were less likely to have a stable daily or weekly drinking frequency over time compared to having a low and stable drinking frequency. Among men with low levels of social contacts, on the other hand, there was no significant difference with regard to having a stable daily or weekly drinking frequency and having a low and stable drinking frequency over time.

**4. Discussion**

This study contributes to the understanding of typical alcohol consumption in older people. It shows that the majority of older people above 65 years of age drink monthly or less often, and that drinking habits are generally stable over time (e.g., Sydén et al., 2014). In line with earlier studies, it also confirms that older women drink less

**Table 3**  
Relative risk ratios (RRR) for the association between social integration factors and changes in drinking frequency among men (n = 471).

		Low and stable drinking frequency (monthly or less) (n = 205)		Decreased drinking frequency (n = 67)		Increased drinking frequency (n = 74)		Stable daily or weekly drinking frequency (n = 125)	
		Model 1		Model 2		Model 1		Model 2	
<b>Social contacts</b>	REF								
Low levels of social contacts		0.60	0.65	0.45	0.46	0.59	0.80		
High levels of social contacts		0.94	0.90	0.67	0.65	1.50	1.27		
<b>Social activity</b>	REF								
Low levels of social activity		0.40*	0.46+	0.47+	0.51	0.24***	0.34*		
High levels of social activity		1.06	1.10	1.12	1.17	1.90*	1.89+		

Model 1: adjusted for age and marital status; Model 2: adjusted for age, marital status, household occupational social class, and health indicators + < 0.10, \* < 0.05, \*\* < 0.01, \*\*\* < 0.001.

frequently than older men (e.g., Kelfve et al., 2014), but that differences are quite small.

This study investigated the association between social contacts, social activity and longitudinal patterns of drinking frequency in a nationally representative sample of Swedish adults above 65 years of age. A main finding was that higher levels of social activity, such as going to cultural events, restaurants, study circles, and dancing, were related to a stable daily or weekly drinking frequency or increased drinking frequency over the four-year follow-up period, particularly among women. Moreover, the results suggested that people with low levels of social contacts or low levels of social activities were less likely to have a stable daily or weekly drinking frequency and also less likely to have an increased drinking frequency over time, compared to having low and stable drinking frequency over time. These results indicate that people who are not part of social settings, do not have frequent drinking habits. Our interpretation of the results is that older people drink alcohol in social situations and that social integration also predicts continued drinking patterns. This is in line with previous studies (e.g., Immonen et al., 2011; Kelly et al., 2018).

Social activity seems to be more strongly associated with more frequent alcohol consumption than social contacts. A possible interpretation is that many social activities occur in a context where there are opportunities for drinking. Alcohol consumption may even be part of the activity. High levels of social contacts, on the other hand, showed no associations with frequency of drinking, while low levels of social contacts were related to decreased or low drinking frequency, but among women only. This too suggests that the most common drinking behavior among older adults is to drink in social contexts and together with other people.

With regard to gender differences, it seems that social contacts, particularly low levels of social contacts, are associated with drinking frequency among women but not among men. Women who do not have social contacts are infrequent alcohol drinkers. Among men, meeting with friends or relatives, or not doing so, does not seem to matter for drinking behaviors. This suggests that the gender norms surrounding drinking behaviors remain quite “traditional” in these cohorts; it is considered inappropriate for women to drink without company, while it is more accepted that men drink alone.

It can be concluded that alcohol consumption is embedded in a social context among older people. Similar results have been found among younger people, where people with light to moderate levels of drinking had higher levels of social integration and social support compared to those who did not drink (Lucas et al., 2010).

Although not apparent in the results of this study, we know from earlier studies (e.g., Kelly et al., 2018) that some older adults drink to cope with social isolation and loneliness. This is a rather small group, and hence does not affect the general population patterns in studies like this one. Yet, this is an important group to study further, especially because harmful drinking habits seem to be more common among older adults who drink alone or who drink to cope. About one third of older at-risk drinkers initiate the harmful drinking habits at older ages (Stevenson, 2005).

Earlier research has suggested that both alcohol consumption and social activities are associated with health. People in better health are more socially active and generally more frequent drinkers. We adjusted for various health indicators in the analyses – functional health, psychological health, and global self-rated health – in order to account for the role of health in the association between social integration and alcohol consumption. Some estimates were attenuated while others increased when adjusting for health, but overall, results remained more or less the same.

A clear strength of this study is that it is based on a nationally representative sample with high response rates; few studies have investigated alcohol consumption in the older population using national samples. In addition, the use of individual-level longitudinal data enables the study of change over time. However, although the use of

longitudinal data is an advantage, the direction and causal influence of the association between social integration and drinking frequency must be interpreted with caution. According to a longitudinal study that investigated both directions of the association between social integration and heavy drinking, the association is bidirectional and both factors influence each other (Moos et al., 2010a). As a sensitivity analyses, we ran an additional model where social contacts at follow-up was included. This did not change the association between baseline social contacts and longitudinal patterns of drinking frequency. It was not possible to run the same analyses for social activity, as the social activity items in the questionnaire were changed in the 2014 data collection.

Finally, a larger sample size would have made further subgroup analyses possible, for example, there may be different patterns in younger and older cohorts of older women and men. The age range in this study is rather wide (66–105), and while it is clearly a strength to include the oldest old in studies of this kind, future studies need to investigate age differences in more detail.

During recent years, both the proportions and numbers of older people who drink alcohol has increased (Kelfve et al., 2014). This study adds to previous work by identifying gender differences in alcohol consumption patterns, and that drinking habits are intertwined with social integration. Interventions targeting older people’s drinking habits should consider the social contexts of drinking. In addition, given that drinking has become more common in the older population, excessive drinking is also likely to increase (Skog, 1985). More research is needed regarding the social contexts of potentially harmful alcohol consumption in the older population.

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The funders had no role in the analyses, interpretation and presentation of results.

#### Contributors

Conceptualization of the study: NA, LD, CL; Analyses: NA; Interpretation of results: NA, LD, CL; Drafting the first version of the manuscript: NA; Revisions of the manuscript: NA, LD, CL.

#### Conflict of interest

No conflict declared

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