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Social networks and alcohol use among older adults: a comparison with middle-aged adults

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Abstract

Objectives—This study compared the association between social networks and alcohol consumption among middle-aged (MA) and older adults (OA) to better understand the nature of the relationship between those two factors among OA and MA.

Method—We examined Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions. Current drinkers aged over 50 were subdivided into two age groups: MA (50–64, $n = 5214$) and OA (65 and older, $n = 3070$). Each age group was stratified into drinking levels (low-risk vs. at-risk) based on alcohol consumption. The size and diversity of social networks were measured. Logistic regression models were used to examine age differences in the association between the social networks (size and diversity) and the probability of at-risk drinking among two age groups.

Results—A significant association between the social networks diversity and lower odds of at-risk drinking was found among MA and OA. However, the relationship between the diversity of social networks and the likelihood of at-risk drinking was weaker for OA than for MA. The association between social networks size and at-risk drinking was not significant among MA and OA.

Conclusion—The current study suggests that the association between social networks diversity and alcohol use among OA differs from the association among MA, and few social networks were associated with alcohol use among OA. In the future, research should consider an in-depth exploration of the nature of social networks and alcohol consumption by using longitudinal designs and advanced methods of exploring drinking networks.

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Social ties; alcohol consumption; age differences; life-span perspective

Introduction

Although alcohol use generally declines with age (Moore et al., 2005), the health risks of drinking are higher among older adults than younger adults because of the increased vulnerability to the effects of alcohol among older adults (Blow & Barry, 2002). Normal age-related physiological changes (Novier, Diaz-Granados, & Matthews, 2015), medical comorbidity (Wu & Blazer, 2014), and increased use of medication that may interact with alcohol (Cousins et al., 2014) exacerbate the negative health effects of alcohol among older adults (Sklar, Gilbertson, Boissoneault, Prather, & Nixon, 2012).

Health risks related to alcohol use among older adults are expected to increase in the future due to an aging population and higher rates of alcohol use among baby boomers (Satre, 2015). Given increasing numbers of older alcohol users and the consequences associated with unhealthy drinking, it is critical to identify and understand factors that influence alcohol consumption among the older population.

One of the key factors associated with drinking behaviors may be social networks. Social networks, defined here as ‘the size and diversity of social ties’ (Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997), are the structural aspects of social relationships (Berkman, Glass, Brissette, & Seeman, 2000). Recent advances in research have suggested mutual influences between social networks and alcohol use (Bullers, Cooper, & Russell, 2001; Moos, Brennan, Schutte, & Moos, 2010). Specifically, social networks may reinforce or constrain drinking behaviors, and the structure of one’s social network may be a product of patterns of alcohol use.

Significant relationships between social networks and alcohol use have been demonstrated among younger adults (e.g. Seaman & Ikegwuone, 2010). Consequently, intervention programs incorporating social network factors have been developed and have been shown to be effective in preventing risky alcohol use among younger adults (Valente, 2012; Valente et al., 2007). Compared to younger adults, our knowledge regarding the association between social networks and alcohol use among older adults remains limited (Ahlström, 2008). If we deepen our knowledge and understanding of the relationship, adequate interventions can be planned and developed to prevent unhealthy drinking among older adults.

Social networks and alcohol consumption among older adults can be understood within a life-span developmental perspective (Uchino, 2009). The life-span approach emphasizes continuity and change in the nature of social networks over the life span (Committee report, 2006; Erikson, 1964). Patterns of drinking behavior are also dynamic constructs that change across the life span (Umberson, Crosnoe, & Reczek, 2010). From a long-term perspective of the life span, it is expected that social networks may be differentially related to alcohol use in different age groups as individuals experience change and variability over the life span

(Nesselroade, 2001). It is, therefore, important to examine the association between social networks and drinking behaviors at different points in the life span (Watt et al., 2014).

Although most developed countries have accepted the chronological age of 65 years as a definition of an 'older adult' (World Health Organization, 2003), much of the alcohol use-related research on older adults has included participants aged 50 and older as a single age group (e.g. Lang, Wallace, Huppert, & Melzer, 2007). These studies might not identify possible differences in the association between social networks and alcohol consumption between middle-aged (MA, age 50–64) and older adults (OA, age 65 and older). Therefore, to identify the association between social networks and alcohol consumption in OA (age 65 and older) and identify differences in the association compared to the earlier life stage (age 50–64), it is necessary to subdivide individuals aged 50 and older into subgroups by age (MA group: 50–64 years; OA group: 65 years and older) (Litwin & Stoeckel, 2013). Differentiating age groups also has implications in developing intervention programs. Differences in the relationship between social networks and alcohol use among MA and OA may shed light on age-specific approaches to intervention. Given health risks related to alcohol use, targeting social networks that might be associated with unhealthy drinking would be beneficial in promoting health among MA and OA. In the present study, guided by the life-span perspective, we explored and compared the association between social networks and alcohol consumption by two age groups: MA and OA.

Age-related changes in social networks

The life-span perspective suggests that changes in social networks occur throughout all stages of the life span (Wrzus, Hanel, Wagner, & Neyer, 2013). Therefore, social network characteristics may differ according to stages of life (Ajrouch, Blandon, & Antonucci, 2005). Socioemotional selectivity theory has provided a compelling explanation of how social networks change with advancing age (Carstensen, 1992). This theory states that having a limited future-time perspective motivates individuals to maintain the most intimate and more meaningful ties and to disband non-intimate and peripheral relationships in order to maximize positive emotional experiences. Due to the limited future-time perspective, OA are more likely to have smaller and more intimate social networks compared to younger adults. There is growing evidence supporting reductions in social networks among OA, particularly among less close social partners (Ajrouch, Antonucci, & Janevic, 2001; Wrzus et al., 2013). Age-related changes in social networks may lead to changes in the association between social networks and alcohol use in later life.

Social networks and alcohol use among older adults

Current conceptual models posit a reciprocal relationship between social networks and alcohol use (Bullers et al., 2001; Moos et al., 2010). While social networks may function both as an inhibitory and facilitating influence on drinking behaviors (Perreira & Sloan, 2001), alcohol consumption may alter individuals' social networks. The former, a social causation perspective, emphasizes that social network norms determine individual drinking behaviors. On the other hand, a social selection perspective posits that individuals' alcohol consumption can have an impact on social networks (Moos et al., 2010).

Empirical evidence supports the existence of the reciprocal association between social networks and alcohol consumption among OA (Moos et al., 2010). To date, however, the findings of previous studies have been largely inconclusive on whether the association is positive or negative. Some studies have found that small social networks were related to less alcohol use (e.g. Bacharach, Bamberger, Cohen, & Doveh, 2007), others found that small social networks were associated with higher levels of alcohol consumption (e.g. Shiovitz-Ezra & Litwin, 2012). A few cross-sectional studies have examined the relationship between social networks and alcohol consumption among OA. Older adults (age 65 and older) with limited social networks have been shown to exhibit a greater risk of alcohol abuse (Shiovitz-Ezra & Litwin, 2012). Among individuals aged 60 and older, Watt et al. (2014) found that older male heavy drinkers are more likely to be divorced/separated (an absence of spousal relationship), and older women heavy drinkers are more likely to be single. Longitudinal studies support the long-term mutual relationships between social networks and alcohol consumption among older adults. In support of a social causation perspective, Perreira and Sloan (2001) found that at six-year follow-up, retirement and widowhood were associated with increased drinking, respectively, and marriage and divorce were associated with both increases and decreases in drinking among individuals between the ages of 51 and 61 at the baseline. Among men whose age ranged from 43 to 70, Bacharach et al. (2007)) found that retirement was associated with a decrease in the severity of drinking problems among those men with a history of problem drinking at two-year follow-up.

One explanation for these inconclusive findings from cross-sectional and longitudinal studies is that the findings may depend on the composition of the sample. With a few exceptions (e.g. Shiovitz-Ezra & Litwin, 2012), these studies consisted of individuals with a wide age range from middle age to old age (age 40 and older), who are in different life stages. As noted, the social network structure changes over the life span (Wrzus et al., 2013). These age-related changes in social networks may lead to heterogeneity in the association between social networks and alcohol use among MA and OA. Because previous studies were less likely to differentiate OA to MA, little is known about how the association between social networks and alcohol use among OA differs from that of adults in middle age.

Based on the life-span perspective, the first aim of the present study is to explore the association between social networks and alcohol consumption *among* two age groups: MA and OA. In this study, each age group was divided by two drinking groups (low-risk drinkers and at-risk drinkers) based on alcohol consumption. Low-risk drinkers were defined as individuals who drink within both the single-day and weekly limits, and high-risk drinkers were defined as individuals who drink more than these single-day or weekly limits (NIAAA, 2010). We categorized alcohol consumption into drinking levels (low-risk vs. at-risk) rather than examining alcohol consumption as a continuous variable because we were more interested in whether social networks are related to lower or greater probability of at-risk drinking, which will provide important clinical implications. Two different measures of social networks (size and diversity) were used in this study. Social network size is defined as the number of persons for which individuals report social interactions (Mowbray, Quinn, & Cranford, 2014). Social network diversity measures the number of types of social relationships (e.g. spouses, children). Social network researchers suggest that the size and diversity of social networks need to be differentiated because they provide different

perspectives on the role of social networks. Social network size indicates social resources that can be beneficial for individuals' health and well-being (Wrzus et al., 2013; Erosheva, Kim, Emler, & Fedirksen-Goldsen, 2015). Social network diversity can be considered an indicator of social network bridging, which provides connections to individuals who are otherwise not connected. Cornwell (2009) argued that social bridging is beneficial because it allows the individual to have access to a variety of resources from different social domains and to be more independent from the control of others.

To examine the association between social networks and alcohol consumption among MA and OA (aim 1), we *explored* the relationship between social networks (size and diversity) between low-risk drinkers and at-risk drinkers *among* two age groups. The second aim of this study is to examine differences in the association between social networks and alcohol consumption between two age groups. Our study tested the following hypotheses:

Hypothesis 1—The size and diversity of social networks will be significantly associated with the odds of at-risk drinking among MA and OA. The direction of the association (higher odds of at-risk drinking or lower odds of at-risk drinking) is not stated because of inconsistency in empirical work regarding the association.

Hypothesis 2—Drawing on the socioemotional selectivity theory in the sense of social networks reductions among OA, the association between social networks and the odds of at-risk drinking among OA will be weaker than that found among MA.

Methods

Data source and participants

The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC: Waves 1 [2001–2002] and 2 [2004–2005]) was conducted by the National Institute of Alcohol Abuse and Alcoholism (NIAAA, Chen, Yi, Dawson, Stinson, & Grant, 2010). NESARC is among the largest nationally representative comorbidity surveys ever conducted and includes extensive questions on alcohol and drug use and related disorders. The data were collected through in-person interviews in household settings with 34,653 civilians, non-institutionalized adults (aged 18 and older) residing in the USA. From each household, one adult was selected to be interviewed. The overall response rate for NESARC was 81%. The methods, quality control procedures, and test–retest reliability have been previously published (Grant et al., 2004). The cumulative response rate over the two surveys was 70.2% (Dawson, Goldstein, & Grant, 2007). We used the second wave of the study (2004–2005), as data were collected on social networks in Wave 2 only. The data were weighted to account for oversampling, survey non-response, and to be representative of the US civilian population using the 2000 decennial census (U.S. Census Bureau, 2004). Participants of this study were restricted to current drinkers aged 50 and older ($n = 8194$). Non-drinkers were excluded in this study because older non-drinkers are more likely to show poorer mental and physical health outcomes (e.g. depression, more falls, increased cardiovascular mortality, poorer general health status) compared to light and moderate drinkers (Anderson, Scafato, & Galluzzo, 2012; Blow & Barry, 2002; Kirchner et al., 2007; Moriconi & Nadeau, 2015;

Naimi et al., 2005). As non-drinking individuals are qualitatively different than current alcohol users due to health, they may represent a different population.

Measures

Social networks—The Social Network Index utilized by the NESARC measured two different aspects of social networks: size and diversity. The Index consists of 12 questions assessing participation in 12 types of social relationships (Cohen et al., 1997). The questions ask about the presence (yes/no) of certain types of the relationships (spouse/partner, parents, and parents-in-law) or the number of people the participants interacts with for the various types of relationships (children, friends, relative, student/teachers, co-workers, neighbors, fellow volunteers, religious group, and other group). The size of social networks was calculated by adding the number of people within each type of social relationships across all 12 groups in which participants see or talk with someone at least once every two weeks (if respondents answered ‘yes’ on a ‘yes/no’ question, it was counted as one). The diversity of social networks was created by counting the number of types of social relationships participants reported that they see or speak to for each type of relationship at least once every two weeks (score range 0–12). Higher scores in the diversity of social networks reflect greater variety of social connections.

Alcohol consumption (drinking levels)—To identify current drinkers, we used the variable ‘drank alcohol in the last 12 months of wave 2’. Participants (current drinkers) were categorized as two drinking groups: low-risk drinkers vs. at-risk drinkers. We used a variable called ‘W2EXCEED’ coded as positive if the respondent was positive for either exceeding the daily or weekly drinking limits recommended in NIAAA’s Physician Guidelines in the past 12 months (NIAAA, 2008). These guidelines for general population are gender specific. Men who drink more than 14 standard drinks per week or more than 5 standard drinks on any day are defined as at-risk drinkers. Women who drink more than seven standard drinks per week or more than four drinks on any day are defined as at-risk drinkers (NIAAA, 2008). Among MA (age 50–64), if respondents drink exceeding either daily or weekly limits based on guidelines for general population, they were categorized as at-risk drinkers. For OA, we followed independent drinking guidelines for older adults suggested by NIAAA (2010). According to the guidelines, OA (aged 65 and older) who drink more than seven standard drinks per week or more than three standard drinks on any day were defined as at-risk drinkers in this study. Based on the risk factors associated with alcohol use by older adults, drinking guidelines for this population are lower than those set for other adults. In addition, the guidelines for older adults should be no more liberal to men because older men who exceed drinking guidelines are more likely to have drinking problems than are older women (Moos, Schutte, Brennan, & Moos, 2004).

Covariates

Socio-demographic correlates—Participants were assessed for several socio-demographic characteristics including age (in years), gender, race/ethnicity (White, Black, American Indian/Alaska Native, Asian/Pacific Islander, and Hispanic), household income (from \$0–19,999 to \$70,000 and over), education, marital status (married, widowed, divorced/separated, and never married), and employment status (retired/not retired).

Mental health disorders: Major depressive disorder and anxiety disorders were examined in this study. These covariates were selected because of their higher prevalence in the US population compared to other mental health disorders (Hasin, Stinson, Ogburn, & Grant, 2007). Moreover, literature suggests that the two mental disorders are highly related to social networks and alcohol use among OA (e.g. Ivan et al., 2014). We used a binary variable examining past year history of major depressive disorder and a binary variable examining past year history of an anxiety disorder, including either the presence of social phobia, panic disorder, and generalized anxiety disorder.

Self-report physical health: Self-report physical health was measured by one item with a response ranges from 1 = excellent to 5 = poor. Thus, lower scores reflect better perceived physical health status.

Data analyses

Statistical data analyses were performed using STATA (Version 14). All analyses incorporated survey weights, clustering on primary sampling units, and stratification (Grant, Kaplan, Shepard, & Moore, 2003). We used Taylor series linearization (STATA ‘svy’ command) to obtain unbiased estimates of standard errors. Before testing two hypotheses, we first examined significant differences in demographic variables, mental and physical health characteristics, and social networks between two drinking groups (low-risk vs. at-risk) stratified by age group. We used *F*-statistic approximations to the Rao–Scott statistic for categorical variables (gender, race/ethnicity, income, education, marital status, employment status, and mental health) and adjusted Wald *F*-tests for continuous variables (age, social networks, and physical health). To test our first hypothesis, a weighted logistic regression model examined the association between social networks (size and diversity) and the probability of at-risk drinking among MA and OA, while adjusting for potentially confounding socio-demographic and health-related variables. To determine whether there were age-group differences in the association between social networks (size and diversity) and the probability of at-risk drinking (hypothesis 2), we added the interactions terms in the next step. We entered interaction terms for age group and each of the social networks indicators (age group $\times$ social network size, age group social $\times$ network diversity). Odds ratios (OR) and 95% confidence intervals (CIs) were reported.

Results

Drinking status and levels among middle-aged and older adults

The number of current drinkers was 5214 in the MA group and 3070 in the OA group. Of the 5214 currently drinking MA included in the analysis, 63.5% ($n = 3281$) were low-risk drinkers, and 36.5% ($n = 1933$) were at-risk drinkers. Among 3070 currently drinking OA, 72.7% ($n = 2231$) were low-risk drinkers, and 27.2% ($n = 839$) were at-risk drinkers.

Socio-demographic, mental and physical health, and social network characteristics by drinking levels

Middle-aged adults (MA)—Table 1 shows differences in socio-demographic, mental and physical health, and social networks characteristics between two drinking groups (low-risk

and at-risk) among MA. At-risk drinkers were more likely than low-risk drinkers to be younger, male, and White. In terms of income, at-risk drinkers were more likely to be included in the lowest (\$0–19,999) or the highest (\$70,000 and over) income group than low-risk drinkers. At-risk drinkers were less likely to be married, but more likely to be divorced/separated or never married compared to low-risk drinkers. Moreover, at-risk drinkers reported lower education levels and more past year anxiety disorder than low-risk drinkers. With regard to social networks, at-risk drinkers reported smaller and less diverse social networks compared to low-risk drinkers.

Older adults (OA)—Among OA, at-risk drinkers were more likely to be younger, male, and married and divorced/separated than were low-risk drinkers (see Table 2). At-risk drinkers tended to report higher income and education and better physical health status compared to low-risk drinkers. No differences were found in the size and diversity of social networks between two drinking groups.

The association between social networks and at-risk drinking among MA and OA

Social network size—As depicted in Table 3, the model showed that social network size was not associated with at-risk drinking among MA and OA. We also found no significant age-group differences in the relationship between the size of social networks and the odds of at-risk drinking. Regression coefficients associated with the relationship between the size of social networks and the probability of at-risk drinkers for MA and OA are presented in Figure 1.

Social networks diversity—In comparison with the social network size, social network diversity was significantly associated with lower risk of at-risk drinking among MA and OA. In addition, we found age group difference in the association between the diversity of social networks and the probability of at-risk drinking ($OR = 1.08, p < 0.05$). Regression coefficients associated with the relationship between the diversity of social networks and the probability of at-risk drinkers for MA and OA are presented in Figure 2. As seen in the figure, among MA, the association between diversity of social networks and the probability of at-risk drinking declines with each additional social network type with 8% lower odds of being an at-risk drinker for additional network type. Among OA, the probability of at-risk drinking is stable regardless of social network diversity.

Discussion

The current study investigated the association between social networks and alcohol consumption (low-risk drinking and at-risk drinking) among MA and OA. Our findings revealed that there was no significant relationship between the size of social networks and at-risk drinking among MA and OA. But our findings did suggest that the diversity of social networks was associated with the probability of at-risk drinking among MA and OA and that the association was weaker for OA than for MA.

The association between social networks and at-risk drinking

We found mixed support for our first hypothesis. We only found that more diverse social networks were associated with a lower risk of at-risk drinking among MA and OA. Our study supports prior work that found a negative association between social networks diversity and alcohol consumption (Mowbray et al., 2014). One possible explanation for the negative association between more diverse social networks and at-risk alcohol use among MA and OA is that social networks serve a regulatory function, in that individuals with diverse social interactions are less likely to engage in risky drinking behaviors such as excessive drinking (Anson, 1989; Ewart, 1991). Social control has been considered to be central to the association between social networks and health behaviors in adulthood (Umberson et al., 2010). Control from social network members can be related to alcohol consumption by helping (e.g. reminding, urging, or threatening) drinkers to decrease alcohol use (e.g. Tucker, Klein, & Elliott, 2004). On the other hand, a greater variety of resources and information from the link from different networks together may be related to health risk behaviors such as drinking (Cohen, 2002; Eriksson, 2011; Putnam, 2000). For example, being socially connected to diverse population has the potential for increasing the odds of being exposed to new alternative behaviors to drinking.

Although we found significant relationship between diverse social networks and a lower risk of at-risk drinking among MA and OA, the association among OA was weaker than that among MA. One possible reason for this finding is a decrease in diversity of social networks among OA. According to the socioemotional selectivity theory (Carstensen, 1992), we assumed that OA would report less diverse social networks than MA and that social networks among OA would be more likely to consist of close and intimate relationships. In consistent with our assumption, we found that OA had significantly less diverse social networks than MA ($p < .001$). It is reasonable to think that the relationship between social networks and the probability of at-risk drinking among OA might be weaker than that of MA, as less diverse social networks are more normative in older adulthood. Reduction in social network might be related to a decrease in the role of social networks as a regulatory function on alcohol consumption (Anson, 1989; Ewart, 1991). Alternatively, overall low alcohol consumption among OA (e.g. Moore et al., 2005) may be associated with the weaker relationship between the diversity of social networks and at-risk drinking among OA than MA.

It is interesting to note that the size of social networks was not significantly associated with alcohol use among MA and OA. The results support findings from a previous study that the diversity of social networks was significant predictor of Alcohol Use Disorder (AUD), while social network size was not associated with AUD (Mowbray et al., 2014). Given the non-significant relationship between the size of social networks and alcohol use among MA and OA in this study, the diversity of social networks might be more critical to alcohol use than network size among this population. This finding suggests that low-risk drinkers among MA and OA are more likely to have diverse social networks, rather than just have a large number of social connections.

Socio-demographic correlates of alcohol consumption

We found some demographic factors related to alcohol use among MA and OA. First, age and female gender were associated with decreased odds of being an at-risk drinker. This is consistent with the literature suggesting that a younger age and male gender are risk factors for excessive alcohol use (Hasin et al., 2007; Moos et al., 2004). Regarding education level, a higher education level was related to an increased OR of at-risk drinking among OA. Our findings align with prior research suggesting OA with higher socioeconomic statuses, including education levels were more likely to be at-risk drinkers (Iparraguirre, 2015). Finally, in both age groups, we found that the presence of a past year anxiety disorder was significantly related to higher risk of at-risk drinking. Previous studies also indicate high comorbidity between anxiety disorders and alcohol abuse (Ivan et al., 2014; Wolitzky-Taylor, Castriotta, Lenze, Stanley, & Craske, 2010).

Implications

Understanding the relationship between social networks and alcohol use is important for developing interventions for unhealthy alcohol use. Literature shows the effectiveness of social network-based interventions in decreasing alcohol use among mixed-age populations (Copello et al., 2002; Litt, Kadden, Kabela-Cormier, & Petry, 2007). Our study suggests that targeting the diversity of social networks may be promising approach to reduce alcohol use among MA. For example, a recent study has found that a pilot test of a computer-assisted motivational social network intervention targeting the diversity of social contacts enhanced motivation to reduce future high-risk alcohol use (Kennedy et al., 2016). Few structural aspects of social relationships were associated with at-risk drinking among OA, suggesting a need to examine other aspects of social relationships that may influence alcohol consumption among this population. Examination of social integration (e.g. frequency of contact with network members) or the quality of relationships (e.g. conflict, support) may provide a better understanding of the association between social networks and alcohol use among OA. Moreover, alcohol consumption among OA might be explained significantly better by other factors controlled for in the analysis. Therefore, exploring the association between social networks and alcohol use with these other factors would afford a more nuanced representation of the association between social networks and alcohol use among OA. Finally, the current study suggests that the size and diversity of social networks need to be differentiated in social networks research (Erosheva et al., 2015).

Limitations

When interpreting these findings, there are some limitations to consider. First, this study is limited by its cross-sectional design, which does not allow one to address causal relations. For instance, the current study was unable to assess whether social networks alter alcohol use or vice versa. Longitudinal research may help to shed light on relationships between social networks and alcohol consumption among OA. In addition, the measurement of alcohol use did not assess other alcohol use-related information such as duration of drinking or change in drinking behavior that may be related to social networks and age. The study could be strengthened if more information related to alcohol use were included. Finally, this study did not reflect the heterogeneity of the elderly population. Given continuous changes

in social networks and alcohol use in later life (Wiscott, Kopera-Frye, & Begovic, 2002), future studies need to distinguish cohorts of older adults, such as young–old and old–old groups.

Conclusions

This study revealed that the association between the diversity of social networks and alcohol consumption (at-risk drinking) varies according to age, and the structural aspect of social networks (size and diversity) plays a somewhat modest role in at-risk drinking among older adults once socio-demographic, mental, and physical health factors are considered. In the future, research should consider a more in-depth exploration of the nature of social networks and alcohol consumption over time. Sophisticated methods of exploring drinking networks, such as social network analysis may present a more nuanced picture than survey methods. Similarly, longitudinal studies should consider both alcohol use and social network characteristics as time varying and reciprocal. The current study provides a foundation for further work on social networks and alcohol consumption, an understudied area of research in older adults compared to younger age groups.

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Figure 1.
Probability of at-risk drinking according to age group and the size of social networks.

Figure 2.
Probability of at-risk drinking according to age group and the diversity of social networks.

Socio-demographics, clinical characteristics, and social networks, stratified by drinking groups among middle-aged adults.

Table 1

	Middle-aged adults (50–64 years, <i>n</i> = 5214)					
	Low-risk drinkers (63.52%)			At-risk drinkers (36.48%)		
	<i>n</i>	Weighted %	<i>n</i>	Weighted %	<i>F</i>	
Age in years (<i>M</i> , <i>SD</i>)	56.24	4.13	55.61	4.16	18.97 ^{**}	
Gender					60.61 ^{**}	
Male	1416	47.96	1125	62.01		
Female	1865	52.04	808	37.99		
Race/ethnicity					3.52 [*]	
White	2203	79.37	1343	81.34		
Black	544	8.47	296	8.39		
American Indian/Alaska Native	58	2.33	33	1.94		
Asian/Pacific Islander	76	3.49	20	1.54		
Hispanic	400	6.31	241	6.78		
Household income					3.69 [*]	
\$0–19,999	434	9.79	297	11.69		
\$20,000–39,999	685	17.46	385	15.85		
\$40,000–69,999	953	29.44	489	25.88		
\$70,000 and over	1209	43.31	762	46.58		
Education					3.58 ^{**}	
<Some high school	289	7.51	214	8.95		
Completed high school	693	20.88	436	22.38		
<Completed college	1576	48.37	919	49.62		
>Graduate studies	723	23.24	364	19.04		
Marital status					8.75 ^{**}	
Married	2067	76.20	1128	70.36		
Widowed	192	3.64	77	3.17		
Divorced/Separated	718	14.27	540	20.03		

Middle-aged adults (50–64 years, <i>n</i> = 5214)						
Low-risk drinkers (63.52%)			At-risk drinkers (36.48%)			<i>F</i>
	<i>n</i>	Weighted %		<i>n</i>	Weighted %	
Never married	304	5.88		188	6.43	
Employment status						0.57
Retired	533	16.41		301	15.48	
Employed	2748	83.59		1632	84.52	
Past year major depressive disorder	267	7.67		169	7.67	0.00
Past year anxiety disorder	199	5.45		155	7.15	5.32*
Self-rated health (<i>M</i> , <i>SD</i>)	2.37	1.07		2.35	1.11	0.23
Social networks size (<i>M</i> , <i>SD</i>)	30.23	27.08		28.30	25.54	4.31*
Social networks diversity (<i>M</i> , <i>SD</i>)	6.32	1.83		6.08	1.82	15.90**

Notes: *M* = mean; *SD* = standard deviation.

* $p < .05$;

** $p < .001$.

Table 2
Socio-demographics, clinical characteristics, and social networks, stratified by drinking groups among older adults.

	Older adult (65 years and older, <i>n</i> = 3070)				
	Low-risk drinkers (72.7%)		At-risk drinkers (27.2%)		<i>F</i>
	<i>n</i>	Weighted %	<i>n</i>	Weighted %	
Age in years (<i>M</i> , <i>SD</i>)	74.49	6.65	72.73	6.03	38.45**
Gender					92.81**
Male	934	45.16	549	66.88	
Female	1297	54.58	290	33.12	
Race/ethnicity					1.03
White	1748	88.46	657	89.06	
Black	218	4.70	82	4.33	
American Indian/Alaska Native	23	1.26	12	1.80	23
Asian/Pacific Islander	18	1.16	4	0.47	
Hispanic	224	4.40	84	4.31	
Household income					9.91**
\$0–19,999	681	24.03	194	17.01	
\$20,000–39,999	760	35.24	258	29.42	
\$40,000–69,999	476	23.95	221	30.20	
\$70,000 and over	314	16.78	166	23.38	
Education					9.24**
<Some high school	387	15.24	134	10.81	
Completed high school	664	30.95	193	24.60	
<Completed college	892	40.05	358	44.60	
>Graduate studies	288	13.75	154	20.00	
Marital status					5.24*
Married	1132	62.52	451	66.74	
Widowed	735	25.15	200	19.33	
Divorced/separated	268	8.35	150	10.89	

Older adult (65 years and older, $n = 3070$)						
	Low-risk drinkers (72.7%)		At-risk drinkers (27.2%)		F	
	n	Weighted %	n	Weighted %		
Never married	96	2.97	38	3.03		
Employment status						0.19
Retired	1837	81.83	665	81.02		
Employed	394	18.17	174	18.98		
Past year major depressive disorder	92	4.01	30	3.11		1.24
Past year anxiety disorder	54	2.36	31	3.19		1.60
Self-rated health (M , SD)	2.59	1.04	2.47	1.05		5.95*
Social networks size (M , SD)	33.60	30.57	33.38	28.75		0.03
Social networks diversity (M , SD)	5.36	1.59	5.38	1.62		0.06

Note: M = mean; SD = standard deviation.

* $p < .05$;

** $p < .001$.

Table 3

Logistic regressions of social network size on at-risk drinking.

	Participants (<i>n</i> = 8194)			
	Model 1		Model 2	
	OR	95% CI	OR	95% CI
Age group	0.74	0.64–0.86	0.47**	0.30–0.72
Social network size	0.99	0.99–1.00	0.99	0.99–1.00
Social network diversity	0.96	0.92–0.99	0.94**	0.89–0.98
Network size × age group	–	–	0.99	0.99–1.00
Network diversity × age group	–	–	1.08**	1.00–1.18
Gender				
Male				
Female	0.49	0.43–0.55	0.49**	0.43–0.55
Race/ethnicity				
White				
Black	0.93	0.78–1.11	0.93	0.78–1.11
American Indian/Alaska Native	0.89	0.56–1.42	0.89	0.56–1.41
Asian/Pacific Islander	0.38	0.24–0.63	0.38**	0.24–0.64
Hispanic	1.01	0.82–1.24	1.01	0.83–1.24
Household income				
\$0–19,999				
\$20,000–39,999	0.98	0.81–1.16	0.97	0.81–1.15
\$40,000–69,999	1.13	0.93–1.37	1.12	0.92–1.36
\$70,000 and over	1.44	1.17–1.76	1.44	1.17–1.77
Education				
<Some high school				
Completed high school	1.10	0.90–1.33	1.08	0.89–1.31
<Completed college	1.10	0.91–1.33	1.09	0.90–1.32
>Graduate studies	0.95	0.77–1.18	0.94	0.75–1.17
Marital status				
Married				
Widowed	1.04	0.86–1.27	1.08	0.88–1.32
Divorced/separated	1.64**	1.40–1.91	1.64**	1.46–1.91
Never married	1.20	0.96–1.51	1.19	1.03–1.50
Employment status				
Retired				
Employed	1.06	0.91–1.24	1.05	0.90–1.23
Past year major depressive disorder	0.93	0.72–1.20	0.93	0.72–1.19
Past year anxiety disorder	1.51*	1.18–1.92	1.50*	1.17–1.91
Self-report health (<i>M</i> , <i>SE</i>)	0.94*	0.85–0.99	0.93*	0.87–0.98

Note: OR = odds ratio; CI = confidence interval; *M* = mean; *SD* = standard deviation.

*
 $p < .05$;

**
 $p < .001$.

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