The effect of retirement on alcohol consumption: results from the US Health and Retirement Study

Xu Wang1, Jessica B. Steier2, William T. Gallo1,3

1 Department of Economics, The Graduate Center of the City University of New York, New York, NY 10016, USA
2 Department of Public Health, The Graduate Center of the City University of New York, New York, NY 10016, USA
3 School of Public Health, City University of New York, New York, NY 10035, USA

Correspondence: William T. Gallo, School of Public Health, City University of New York, 2180 3rd Avenue, New York, NY 10035, USA, Tel: +1 212 817 7986, Fax: +1 212 817 1683, e-mail: william.gallo@hunter.cuny.edu

Background: Prior research examining the association between retirement and alcohol consumption is inconsistent with respect to salience and magnitude. Reasonable conceptual arguments for both positive (e.g. coping, introduction of leisure time) and negative (e.g. severance of work-related social relationships) changes further complicate investigations of this critical association, as do differences in study design, national setting and measurement of alcohol use. Methods: This prospective longitudinal study analyses 2-year wave-pairs drawn from seven waves (14 years) of data from the US Health and Retirement Study to assess the effect of complete retirement on weekly alcohol consumption (n = 9979 observations; 4674 unique participants). We use multiple regression analysis in a two-period follow-up design and account for potential selection bias and reverse causality not addressed in prior research on this topic. Results: We find that retirement is positively associated with subsequent weekly alcohol consumption for men who reported drinking at both follow-up and the prior study wave (β = 1.9, 95% confidence interval = 0.43–3.36). No association was observed among women. Conclusion: Our results suggest that health care professionals should monitor the drinking habits of retired men, as older individuals are particularly susceptible to the adverse effects of heavy alcohol use.

Introduction

Despite garnering much recent attention as a protective factor against ischaemic heart disease,1–4 alcohol use has been found to be related to more than 60 different medical conditions, including neuropsychiatric disorders, certain cardiovascular problems, gasto-intestinal diseases and cancers, particularly liver, mouth and oropharynx and oesophageal cancers.5 Drinking also raises the risk of both intentional and unintentional accidents. Twenty percent of motor vehicle accidents, 10% of drownings, 7% of falls, 18% of poisonings, 11% of self-inflicted injuries and 24% of homicides have been ascribed to drinking. Overall, alcohol accounts for as much of the global burden of disease as tobacco and hypertension.6 Age-related changes—among them declines in body fluid, increased sensitivity and decreased tolerance to alcohol and compromised metabolism of alcohol in the gastrointestinal tract—make older individuals more vulnerable to the adverse effects of alcohol consumption,7–8 and attendant effects have been documented. For example, research9–10 has shown that 14% of people aged ≥65 years who had hospital emergency visits had a history of problem drinking, and among those referred for in-home psychiatric assessment, 10% had severe alcohol-related problems.11 About one-third of older adults with drinking problems are late onset abusers.12 Theoretical research in social gerontology suggests that retirement is a life transition whose significance may provoke lifestyle and health behavioural alterations, among which are changes in alcohol consumption.13 As such, retirement has been investigated in relation to changes in alcohol use and onset of alcohol abuse. However, evidence on the effects of retirement on alcohol use is inconclusive. Several studies have suggested that retirement leads to increased drinking or problem drinking,9,13–17 while others have found declines or no retirement-related change.18–23 Research in this area is nevertheless limited; a somewhat small assemblage of studies...
that differ substantially across samples and in measurement comprises the corpus of research.

The contradictory findings align, moreover, with conceptual justification for both positive and negative changes in alcohol consumption. Support for increased drinking after retirement derives from two somewhat disparate themes: loss and leisure. 24 The first idea posits that retirement produces stress 25 that is occasioned by loss of status, professional position, workplace identity and role and employment-based social support. Increased use of alcohol in retirement is therefore used as a means of coping with, or buffering against, the stress. The second idea suggests that retirement introduces unstructured leisure time and wider social liberties—with fewer consequences—which may encourage greater alcohol use. On the other hand, conceptual arguments for decreased alcohol use following retirement primarily relate to the severance of social ties with colleagues who encourage drinking, and to relief from work-related stress. 24 Skeptics of the retirement–health association suggest that withdrawal from the labour force simply represents continuation of pre-retirement trajectories of behaviour, 26,27 which supports studies that have found a null association.

Ambiguity in the salience, direction and magnitude of the relationship between retirement and alcohol use is, at least partially, explained by design and measurement variation across studies. While some of the studies are based on fairly small selected regional samples, others use national data. Moreover, while virtually all of the studies use two-period panel designs, study frames differ considerably, so that any behavioural changes associated with retirement may not yet accrue (in short panels) or may dissipate (in long panels), reducing the comparability of the findings. Outcomes also vary, from self-reports of daily use (e.g. ‘How many alcoholic drinks do you consume per day, on days when you drink?’) and problem drinking to simple measures of change (e.g. ‘Has your alcohol use increased, decreased or stayed the same since we last interviewed you?’). In addition, the various countries studied have different social norms around alcohol, labour market structures and retirement policies. The assumption that retirement would lead to analogous effects is likely naïve.

A more general limitation of the extant research is that it has not accounted for selection. Two forms of selection are relevant to our study. One type relates to the proclivity to consume alcohol. More specifically, if drinkers are systematically different from non-drinkers, then estimates of the effect of retirement that do not take account of such differences will be biased. The second type derives from reverse causality. That is, if pre-retirement alcohol use is associated with higher risk of retirement, then causal inference of retirement on subsequent alcohol use will be weakened. What is unclear is the direction of the average effect of prior alcohol use on retirement. Alcohol-related problems may adversely affect productivity and raise the risk of chronic diseases and accidental injuries, which may force individuals to retire early. Economists have addressed this type of endogeneity in retirement studies that were focused on other outcomes. 28 Nevertheless, there is competing evidence that alcohol-related health decrements may increase personal medical costs, whose payment may necessitate a longer period in the labour force, thereby delaying retirement. 29–31

The goal of our research is to assess the relationship of full retirement to weekly alcohol use. Our study will address gaps in the research in the following ways. First, we use seven waves (14 years) of data, with two observations per participant, spanning from 1995 through 2008, from a national longitudinal survey—the US Health and Retirement Study (HRS). Our ultimate analysis sample has a size of nearly 10,000 person–wave observations, the statistical power of which permits analysis of both secular (time) effects and gender strata. Second, our outcome variable, average weekly alcohol consumption, is constructed by combining information on drinking frequency and intensity. This provides a more accurate measurement of drinking outcome than those of many previous studies. Third, we have carefully addressed selection bias and reverse causality in an effort to obtain a less contaminated effect of retirement on follow-up alcohol consumption.

**Methods**

**Study design and data**

Our investigation is a longitudinal analysis of data from the HRS. The HRS is a national representative, US panel survey that was created with the support from National Institute on Aging and the Social Security Administration. It was developed primarily to study health and economic well-being among individuals transitioning to retirement in the USA. The survey provides rich information about demographics, health status, health behaviour, job status and history and income for individuals aged >50 years and their spouses. The HRS consists of five age cohorts, which together include individuals who were born between 1924 and 1953. Following a baseline assessment, whose timing varied by cohort, subsequent interviews take place every 2 years. The initial interview of the HRS cohort (born 1931–1941) took place in 1992, which is the earliest wave in the HRS file. The addition of the remaining four cohorts was staggered. The oldest old (AHEAD; born before 1924) were first interviewed in 1993; children of the depression (CODA; born between 1924 and 1930) and war babies (WB; born between 1942 and 1947) were added in 1998; and early baby boomers (EBB; born between 1948 and 1953) were initially surveyed in 2004. There were nine waves of data released when our study was undertaken.

The analysis sample comprises respondents aged >50 years who participated in at least two surveys and provided valid data for working status. Our data are arrayed in multiple data records based on wave-pair, where each wave-pair combines data from adjacent survey waves. In this way, all data records contain pre-retirement data and a follow-up outcome assessment. We excluded respondents who were not working at the pre-retirement wave (baseline wave) of each wave-pair, as these respondents were not at risk for the retirement exposure.

We used seven of the nine waves of HRS data for our study, spanning from 1995 to 2008. Because the alcohol consumption measure in the first two waves is different from those in all later waves, we excluded the first two waves of data from the analysis sample to maintain a consistent measurement of alcohol consumption. Our eligible sample—which was limited to participants aged >50 years who were working at the first wave of each wave-pair—comprised 12,488 observations. Individuals who had missing information on relevant variables were excluded from the analysis sample. Exclusions (n = 2509) were largely due to missing data on the depression measure (n = 2220); other variables with missing data were race (n = 5), education (n = 45), marital status (n = 37), weekly alcohol consumption (n = 201) and medical conditions (n = 1). The final sample (n = 9,979 observations; 4674 unique participants) includes 5540 men (2561 unique participants) and 4439 women (2113 unique participants).

**Outcome measure: weekly alcohol consumption**

We constructed average weekly alcohol consumption based on data from HRS wave 3 through wave 9. HRS respondents were first asked: ‘Do you ever drink alcoholic beverages?’ Those who responded yes were then asked two follow-up questions about the frequency and intensity of alcohol consumption. In wave 3 and later waves, the questions were ‘In the last three months, on average, how many days per week have you had any alcohol to drink?’ Participants who did not respond ‘none or less than one day’, were then asked ‘In the last three months, on the days you drink, about how many drinks do you have?’ We multiplied the weekly drinking frequency variable by the...
daily quantity to obtain an average weekly alcohol consumption measure. Once more, we excluded data from waves 1 and 2, which categorize daily alcohol consumption (<1 drink per day, 1–2 drinks per day, 3–4 drinks per day, or ≥5 drinks per day), to maintain continuous measurement of our outcome variable.

Independent variables

Exposure: retirement

Retirement is a dichotomous variable that indicates that a study participant who was working full-time or part-time at the baseline wave has retired completely from the labour force. It is assessed at the follow-up wave of each two-wave pair. Individuals who did not retire by follow-up comprise the comparison group, which includes full-time and part-time workers, the unemployed and workers who are partly-retired, disabled or not in the labour force for reasons other than retirement.

Other explanatory variables

Covariates included race/ethnicity, education, age, marital status, non-housing wealth, depressive symptoms score, number of medical conditions and alcohol consumption at baseline. All variables were lagged; that is, they were measured at the baseline wave in each wave-pair. Race/ethnicity was measured by three dummy variables [white (referent), black and other race]. Education was dummy coded into five categories: less than high school education (referent), General Education Diploma or high school equivalency, high school graduate, college degree and more than a college degree. Age is a continuous variable. Marital status was measured by a dichotomous variable that indicates whether married or partnered (versus other marital status). Non-housing wealth is a continuous variable, with millions of dollars as the measurement unit.

The depressive symptoms measure is a summary score that was derived from responses to eight statements from the Center for Epidemiologic Studies Depression Scale (CES-D). The eight items determine whether, in the past week, the respondent felt depressed, everything was an effort, sleep was restless, was happy, felt lonely, felt sad, could not get going and enjoyed life. After dichotomizing original Likert-scaled responses and reverse coding the positively framed statements, HRS summed item responses to create a summary score, where higher scores reflect worsening mental health. A number of medical conditions (range: 0–8) were measured as the doctor diagnosed health problems. It also has eight components and was constructed based on whether the doctor ever told the respondent that she/he has (i) high blood pressure or hypertension; (ii) diabetes or high blood sugar; (iii) cancer or a malignant tumour of any kind, except skin cancer; (iv) chronic lung disease, such as chronic bronchitis or emphysema; (v) heart attack, coronary heart disease, angina, congestive heart failure or other heart problem; (vi) stroke or transient ischaemic attack; (vii) emotional, nervous or psychiatric problem; and (viii) arthritis or rheumatism.

Analysis

Univariate statistics were used to describe the sample. Gender-stratified multivariate regression models were fitted to investigate the association between retirement and average weekly alcohol consumption, owing to gender differences in alcohol consumption, intensity, abuse and motivation. We estimated a single model specification for two nested gender-stratified subsamples. The first subsample (Sample 1) was limited to participants who reported some alcohol use at follow-up, so that the phenomenon of drinking initiation (i.e. onset among baseline non-drinkers) is captured in the retirement coefficient. The second subsample (Sample 2) included only participants who reported alcohol use at both baseline and follow-up. In this case, the retirement coefficient captures variation in drinking intensity only among baseline drinkers, omitting the influence of onset. All models were adjusted for HRS cohort, time (survey wave) and the interaction of time with retirement. The time variables account for secular trends in alcohol consumption, whereas the interaction of time with retirement accounts for heterogeneity in the effect of retirement on weekly alcohol consumption at different periods over the study period. Robust standard errors were used to adjust for intra-subject correlation resulting from repeated observations of study participants.

To address the matter of drinking-status selection, we fitted Heckman two-stage models (Heckman, 1979) on the gender-stratified subsamples. The results of these models indicated selection bias in the female stratum only. As such, we present selection-corrected results for females, but not for males. Logistic regression models were used to investigate the potential influence of baseline drinking intensity on retirement. Neither unadjusted nor adjusted regressions suggested evidence of reverse causality. Therefore, we made no attempt to account for reverse causality in our final models. We also performed two sensitivity checks related to the missing data on CES-D, a potential problem because of its correlation to alcohol use. First, we re-introduced the missing observations and fit our models with a dummy variable for the missing CES-D scores; we then estimated the models with mean imputed values. In both cases, the results were qualitatively similar to the reported results. Analyses were carried out using STATA 12.

Results

Table 1 contains summary statistics for the gender-stratified sample by retirement status. Approximately 11% of men and 10% of women fully retired over the study frame. Male participants consumed more alcohol at both baseline and follow-up than female participants. Other relevant information may be obtained from table 1.

Table 2 contains gender-stratified results of regressions that estimated the association between retirement and average weekly alcohol consumption. Once more, the regression models were estimated both among participants who indicated alcohol consumption at follow-up (Sample 1), irrespective of baseline drinking status, and those who reported some alcohol consumption at baseline and follow-up (Sample 2). The motivation for differentiating the subsamples is to distinguish retirement’s influence on alcohol use with, and net of, onset (or resumption) of drinking among baseline non-drinkers.

Our findings indicate that retirement is associated with higher weekly alcohol consumption among men in Sample 2 (β = 1.9, 95% confidence interval = 0.43–3.36), but not within Sample 1. Taken together, these results imply that retirement affects the behaviour of stable drinkers more than baseline non-drinkers who either begin or resume consumption. Alcohol consumption at baseline is associated with higher weekly alcohol consumption across models, regardless of the gender. Significant effects of other control variables are noted in table 2.

Discussion

This study used a two-period follow-up design to examine the relationship between retirement and weekly alcohol consumption. The results of gender-stratified multivariate regression models indicated that retirement is positively associated with subsequent alcohol consumption among men who consumed alcohol at both follow-up and baseline (i.e. consistent drinkers). While potential mechanisms for increased drinking among retirees are not directly tested in this study, the findings may be motivated by transition-related stress or greater opportunity for alcohol consumption without occupational consequences. Nevertheless, health care professionals should monitor the drinking habits of retired men, as older individuals are
particularly susceptible to the adverse effects of heavy alcohol use. Pre-retirement planning projects should, moreover, include information about the potential dangers of alcohol consumption.

Our findings align with those of some earlier research, although differences in study frame, stratification and measurement of both retirement and alcohol use preclude direct comparison. 

This investigation builds on existing research in several notable ways. First, despite the two-period design, the use of 14 years of data allows us to circumvent the undue influence of discrete economic events, and generate sufficient person-wave observations to analyse gender strata. Second, our outcome variable, a continuous measure of average weekly alcohol consumption, provides a more comprehensive measurement of drinking than those of many earlier studies, which analysed categorical measures, including self-reported change. Third, our inclusion of age as a covariate allows for the potential impacts of reverse causality and differential selection into drinking, at least one of which (i.e. selection) we found to affect the relationship between retirement and alcohol consumption among women.
Several limitations should be noted. For example, although research has affirmed the reliability and validity of measuring alcohol use through self-report methods, our measure of alcohol use may be prone to downward bias, and therefore understates true alcohol use. In addition, because HRS interviewers do not explicitly define the term ‘standard drink’ when eliciting data on alcohol use, participants’ varying interpretation, if non-random, could introduce bias to the outcome measure. Our use of a weekly consumption measure may also mask differences in the patterns of consumption. The two-period design precludes observation of longer-term reversal of post-retirement changes, as has been documented. Inferring clinical significance in such a design is also difficult, requiring an exhaustive set of wave and wave*retirement to account for competing inter-period effects. The omission of potential participants based on missing CES-D scores may also introduce bias, although the direction is indeterminate.

Major life events may precipitate adverse changes in health behaviours that place individuals at elevated risk of chronic diseases. As the older individuals are particularly vulnerable to the physiological effects of alcohol, it is imperative to identify transitions, such as retirement, that lead to increased consumption. The demographic expansion of older individuals is projected to increase health care costs significantly. Thus, promoting healthy ageing is on the forefront of the US public health agenda. Understanding the role of retirement in subsequent behaviour is critical to identifying populations for intervention, so as to increase the overall health of older individuals.

Conflicts of interest: None declared.

Key points
- Fourteen years of data permit examination of retirement-related drinking changes by gender.
- Continuous measure of alcohol consumption is improvement over categorical measures of change in previous research.
- Age and trends in drinking over lengthy follow-up period are carefully controlled.
- Potential impacts of reverse causality and differential selection into drinking are incorporated into analyses.

References