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Is life satisfaction hump-shaped with alcohol consumption? Evidence from Russian panel data

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HIGHLIGHTS

- The shape of the relationship between alcohol use and well-being is still debated.
- Controlling for unobserved individual heterogeneity might be of importance.
- We used individual longitudinal data from Russia to investigate this issue.
- In fixed effect regressions, we found a hump-shaped relationship among men.
- We found no relationship between alcohol use and satisfaction among women.

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ABSTRACT

There has been a growing interest in the study of the shape of the relationship between alcohol consumption and psychological well-being in recent years. Overall, evidence is however still mixed and debated, the type of measures and methods of analysis having been emphasized as key elements in these studies. This paper contributes to this debate by providing new evidence relying on a large-scale population-based study. We used the Russia Longitudinal Monitoring Survey to build an unbalanced panel of 17,953 individuals providing 97,973 observations throughout 10 rounds. We studied the shape of the relationship between alcohol consumption (defined in grams of pure alcohol consumed in the last 30 days) and life satisfaction (measured by a five-item scale) by running a set of regressions. We successively introduced a large number of control variables (age, gender, marital status, occupation, income, health condition, education, living area, smoking status, and body mass index) and individual fixed effects in order to take both potential confounders and unobserved individual heterogeneity into account. Unadjusted analyses indicated a clear hump-shaped relationship between life satisfaction and alcohol use. The association was inverse J-shaped among men and inverse U-shaped among women. When control variables and individual fixed effects were introduced, the hump-shaped curve became increasingly flattened in all samples. Among women, all specifications (linear, quadratic and based on quartile dummies) turned non-significant. The quadratic specification for alcohol use remained however significant in the full sample and among men. In addition, in these two samples, being a fourth quartile drinker was negatively associated with satisfaction.

1. Introduction

There has been a growing interest in the study of the shape of the relationship between alcohol consumption and psychological well-being in recent years. A non-linear relationship between alcohol consumption and symptoms of depression has already been described, alternatively as a J-shaped and a U-shaped relationship (Alati et al., 2005; Lipton, 1994; Rodgers et al., 2000; Skogen, Harvey, Henderson, Stordal, & Mykletun, 2009). Overall, evidence is however still mixed and debated. Firstly, some authors have regarded some of these results as a statistical artifact due to study design and interpretation (Taylor & Rehm, 2005). Secondly, important gender differences have been underlined, with a number of studies suggesting a linear relationship among women (Alati et al., 2004; Caldwell et al., 2002; Zhan et al., 2012). Thirdly, the types of measures used for both alcohol consumption and well-being have been emphasized as being key issues, leading to inconsistent findings, in such studies (El-Guebaly, 2007; Graham, Massak, Demers, & Rehm, 2007).

For all these reasons, it seems important to accumulate new evidence about the shape of the relationship between alcohol consumption and well-being using various samples, various types of measures for the

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two variables of interest and various statistical methods. In this paper, we wish to contribute to this aim by studying the relationship between alcohol consumption and life satisfaction data using a large-scale population-based study. Existing evidence concerning the relationship between alcohol consumption and positive measures of well-being, such as life satisfaction or happiness scores, is very limited. Restricting ourselves to surveys in the adult population, we found five studies that addressed this issue, often as a secondary objective. They relied on quite heterogeneous measures of well-being: happiness categories (Brenner, 1967), a happiness score (Ventegodt, 1995; cited by Veenhoven, 2003), the Cantril Self Anchoring Striving Scale (Levy, Bell, & Lin, 1980), a life satisfaction score (Koivumaa-Honkanen et al., 2012) and the Personal Well-being Index (Cummins, 2008).

One of these studies (Levy et al., 1980) reported a U-shaped relationship: excluding heavy drinkers, a decreasing linear relationship was found between drinking and perceived satisfaction. Heavy drinkers however reported a higher satisfaction than moderate drinkers. A possible explanation, put forward by the authors, is that the levels of satisfaction reported by heavy drinkers might be inappropriate since alcohol abusers would be more susceptible to deny or fail to perceive or report their dissatisfaction.

The four other studies tended to confirm the plausibility of a hump-shaped relationship. First, Brenner (1967) indicated that light drinkers had a higher mean happiness score than abstainers and medium/large drinkers. Statistical significance was however not reached (results based on our own calculations using Brenner's data — see Appendix A). Second, Ventegodt (1995) (cited by Veenhoven, 2003) reported that correlations were low and not significant, but an inverse U-pattern seemed plausible: moderate drinkers tended to be happier than abstainers and heavy drinkers. The greatest satisfaction was reached at 3–4 glasses consumed the week prior. Third, Cummins (2008) noticed not only that drinking a small amount of alcohol each day was generally associated with high well-being, but also that important differences appeared when gender and age were taken into account. More precisely, he found that females who never drank and females who drank more than three drinks per session had below normal well-being, while males who drank every day had above normal well-being, with no systematic change in male well-being with the number of drinks consumed. In terms of age, not drinking alcohol disadvantaged well-being for the 36–65 year group, as well as drinking more than three drinks per session for the 46–55 year group. Fourth, Koivumaa-Honkanen et al. (2012) found an inverse J-shaped relationship between a life satisfaction score and alcohol consumption for both men and women in their cross-sectional unadjusted analysis.

All these studies relied on unadjusted analysis, i.e. did not control for confounding variables, except Cummins (2008) who used ANOVA analysis with covariates of gender, age and income. Maybe even more importantly, they did not use individual fixed effects, which have been emphasized as crucial in life satisfaction studies (Ferrer-i-Carbonell & Frijters, 2004). We overcame these limitations in our study.

2. Material and methods

Our study was based on data from the "Russia Longitudinal Monitoring Survey, RLMS-HSE", conducted by the Higher School of Economics and ZAO "Demoscope" together with the Carolina Population Center, the University of North Carolina at Chapel Hill and the Institute of Sociology RAS (RLMS-HSE sites: http://www.cpc.unc.edu/projects/rlms-hse, http://www.hse.ru/org/hse/rlms). This is a comprehensive survey carried out on a representative sample of Russian households and individuals, almost every year since 1992. It provides detailed information on demographics, education, income, health, occupation, consumption patterns and life satisfaction, among others. The survey consists of two phases. Since only phase II contains a panel component (the same households and individuals were re-interviewed in each round to the extent possible), we restricted our analysis to this phase. It has 14 rounds (rounds 5 through 19) running from 1994 to 2010.

2.1. Life satisfaction

The question was formulated this way: "To what extent are you satisfied with your life in general at the present time?", with the following possible answers: fully satisfied, rather satisfied, both yes and no, less than satisfied, not at all satisfied. We rated "fully satisfied" 5 and "not at all satisfied" 1.

2.2. Alcohol consumption

Respondents were asked whether they had consumed any alcohol during the last 30 days. Those who answered by the negative were considered as abstainers. Those who answered by the affirmative were then asked about the frequency of consumption (once in the last 30 days, 2–3 times in the last 30 days, once a week, 2–3 times a week, 4–6 times a week, every day), the types of beverage (beer, dry wine, fortified wine, home-made liquor, vodka and other hard liquor, anything else, with multiple answers being allowed) and the quantity usually consumed (in grams per day,[1] for each type of beverage).

In the first five rounds of phase II of the survey (rounds 5 to 9), what should be considered as an alcoholic beverage was not specified in the initial filter question about any alcohol consumption in the last 30 days. This should not be problematic if everyone agrees about what an alcoholic beverage is. This might however not be the case in Russia since until July 2011 beverages containing less than 10% alcohol were officially classified as foodstuff, with no restriction on sales. As a consequence, many Russians considered beer as a soft drink. This is why from the 6th round (round 10) on, a complementary filter question was added about any beer consumption in the last 30 days. Data indicated that about 10% of respondents who spontaneously declared being non-drinkers (i.e. responded by the negative to the first filter question) did in fact drink beer (i.e. responded by the affirmative to the second filter question). This means that in rounds 5 to 9, some respondents were inappropriately excluded from the sample of drinkers. For this reason, we decided to exclude the first five rounds (rounds 5 to 9) from our analysis.

By combining the frequency of consumption and the average daily consumption, we constructed an indicator measuring the monthly quantity of pure alcohol consumed. Since different types of beverages contain different percentages of ethanol (pure alcohol), the average daily consumption was calculated as a weighted average of the ethanol typically found in each beverage. Following Baltagi and Geishecker (2006), we assumed that the amount of ethanol is 5% in beer, 10% in dry wine, 19% in fortified wine, 45% in homemade liquor, 40% in vodka and 20% for other alcoholic beverages.

2.3. Control variables

We used standard socio-demographic variables as controls: age, gender, marital status, occupational status, real household income, health condition, education level (high school diploma), settlement type and geographical area of living, as well as smoking status and body mass index (BMI) as two other potentially important confounders. Since pregnancy is presumably related both to alcohol consumption and satisfaction in a very specific way, pregnant women were excluded from our sample.

[1] In Russia, it is common to measure alcohol consumption in grams instead of liters.