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Preference weights for the spectrum of alcohol use in the U.S. Population

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ABSTRACT

Background: Little is known about the cost-utility of population-based alcohol interventions. One barrier to research has been the lack of preference weights needed to calculate Quality Adjusted Life Years (QALYs). Preference weights can be estimated from measures of health-related quality of life (HRQOL). The objective of this study was to describe preference weights for the full spectrum of alcohol use.
Methods: This cross-sectional study included participants in both the National Health Interview Survey (NHIS; 1999–2002) and the Medical Expenditure Panel Survey (MEPS; 2000–2003). The AUDIT-C alcohol screen was derived from NHIS with scores categorized into 6 groups (0,1–3, 4–5, 6–7, 8–9, 10–12 points), ranging from nondrinking (0) to very severe unhealthy alcohol use (10–12). AUDIT-C scores were mapped to EQ-5D and SF-6D preference weights using the linked datasets and analyses adjusted for demographics.
Results: Among 17,440 participants, mean EQ-5D and SF-6D preference weights were 0.82 (95% CI 0.82–0.83) and 0.79 (95% CI 0.79–0.80), respectively. Adjusted EQ-5D preference weights for nondrinking (0.80; 95% CI 0.79–0.81) and moderate unhealthy drinking (0.85; 95% CI 0.84–0.86) were significantly different from low-risk drinking (0.83; 95% CI 0.83–0.84), but no other differences were significant. Results for the SF-6D were similar.
Conclusions: This study provides EQ-5D and SF-6D preference weights for various alcohol use categories in a representative U.S. adult sample. However, neither measure suggested meaningful differences in HRQOL based on AUDIT-C categories. Self-reported alcohol consumption may not be associated with preference weights or generic instruments may not capture alcohol-related differences in HRQOL.

1. Introduction

Unhealthy alcohol use, which ranges from drinking above recommended limits to meeting criteria for alcohol use disorders (AUD; Saitz, 2005), is a leading preventable cause of morbidity and mortality (Rehm et al., 2010; US Burden of Disease Collaborators, 2013). The societal costs of unhealthy alcohol use were over $200 billion in the U.S. in 2006, due to lost productivity, health care costs, and criminal justice costs (Bouchery et al., 2011). Routine screening for alcohol misuse in general medical settings and repeated brief alcohol counseling for patients who screen positive is effective for reducing drinking (Jonas et al., 2012; Kaner et al., 2009). However, it is difficult to determine how to prioritize investment in alcohol prevention efforts compared to other prevention priorities.

Cost utility analyses (CUA) allow comparison of the cost-effectiveness of interventions for different conditions with a common metric—the quality adjusted life year (QALY). QALYs are

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calculated by multiplying a preference weight for a particular health state by time spent in that health state. Preference weights incorporate a health state's desirability into the QALY and range from 0 for states valued equal to "death," to 1 for "perfect health" (Gold et al., 1996). Preference weights can be obtained from generic multi-attribute health-related quality of life (HRQOL) measures, such as the EuroQoL (EQ)-5D and Short Form (SF)-6D. These generic measures can be collected on large, population-based surveys and preference weights can be indirectly assigned to health states using published algorithms. The use of generic systems for classifying health states was recommended by the U.S. Panel on Cost Effectiveness because it yields QALYs that are more comparable across health conditions (Gold et al., 1996). Developing preference weights for different health states also allows researchers to conduct CUAs for health interventions or policies when information on HRQOL was not directly assessed.

Patient-reported drinking based on alcohol screening results is becoming increasingly available in electronic medical records, creating new opportunities to evaluate the cost-effectiveness of interventions designed to address unhealthy alcohol use in medical settings. However, evaluations of interventions incorporating impacts on QALYs would require either direct measurement of HRQOL for all screened patients—which may be infeasible—or using existing preference weights from prior studies. The EQ-5D and SF-6D are widely used generic HRQOL measures for deriving preference weights for physical and mental health conditions (Roberts et al., 2014; Sullivan et al., 2005), but few population-based studies have used them to report preference weights for differing levels of alcohol consumption. EQ-5D preference weights have been reported for alcohol use categories among study samples from rural Australia (Petrie et al., 2008), England (Essex et al., 2014; Maheswaran et al., 2013), and Finland (Saarni et al., 2008). In these studies, associations between EQ-5D preference weights and alcohol use were mixed—two studies found high-risk drinking was associated with lower preference weights (Essex et al., 2014; Petrie et al., 2008), while others did not (Maheswaran et al., 2013; Saarni et al., 2008).

However, no study has described the associations of EQ-5D or SF-6D preference weights with alcohol consumption categories based on alcohol screening results in the U.S. general population. It remains unclear whether these generic HRQOL measures vary across differing levels of alcohol consumption in a population-based sample. If unhealthy alcohol use is associated with poorer HRQOL, these decrements could translate to lower preference weights and may suggest an adverse effect on QALYs and potential cost-effectiveness of interventions that reduce drinking. The present study utilized data from two nationally representative surveys in the U.S. to estimate mean preference weights for the spectrum of alcohol use—from no alcohol use to very severe unhealthy alcohol use—using the EQ-5D and SF-6D. Mean preference weights were also estimated for the frequency of binge drinking among past-year drinkers and analyses evaluated evidence of differences in associations by age and gender.

2. Methods

2.1. Data sources and sample

This study utilized the National Health Interview Survey (NHIS; 1999–2002), linked to the Medical Expenditure Panel Survey (MEPS; 2000–2003). Alcohol consumption measures were obtained from NHIS and HRQOL measures from MEPS. The NHIS is a nationally representative survey of the civilian, non-institutionalized, U.S. population conducted by the National Center for Health Statistics. One adult from each sampled household is randomly selected to complete the adult questionnaire, which includes questions on health behaviors including alcohol use, health status, and health services used. The NHIS provides a sampling frame for the subsequent year's MEPS; approximately three-eighths of NHIS respondents are made available for MEPS recruitment. MEPS response rates averaged approximately 65%.

Respondents were eligible for the present study if they were age 18 or older, completed the adult questionnaire on NHIS and MEPS the subsequent year. Adults were included in the study sample if they completed measures of alcohol use on NHIS, HRQOL on MEPS, and other covariates. Among 127,545 adults who responded to the NHIS adult questionnaire over the study period, 19,364 participated in MEPS and 17,440 of MEPS participants (90.1%) completed all measures needed. The University of Washington Institutional Review Board considered this study exempt from human subjects review because data were publicly available and de-identified.

2.2. Measures

2.2.1. Alcohol use categories. Individuals' alcohol consumption was based on a derived AUDIT-C score, grouped into 6 categories. Derived AUDIT-C scores reflect average alcohol consumption and probability of AUD (Dawson et al., 2005; Rubinsky et al., 2013). Following methods validated previously (Dawson et al., 2005), AUDIT-C scores were generated based on individuals' responses to three NHIS alcohol consumption questions: (1) frequency of past-year drinking, (2) usual quantity of drinking on drinking days, and 3) frequency of binge drinking (≥5 drinks per day). Following Dawson et al., AUDIT-C scoring conventions were followed to assign 0–4 points to each item based on quantity/frequency, yielding a total score of 0–12 points (Table S1[1]). Derived AUDIT-C scores were assigned to 1 of 6 groups reflecting increasing severity of unhealthy alcohol use: 0 (*nondrinking*), 1–3 (*low-risk drinking*), 4–5 (*mild unhealthy alcohol use*), 6–7 (*moderate unhealthy alcohol use*), 8–9 (*severe unhealthy alcohol use*), and 10–12 (*very severe unhealthy alcohol use*). These groups were selected based on previous research finding scores ≥6 points were associated with increased risk for hospitalizations for gastrointestinal conditions, scores ≥8 points with trauma-related hospitalizations, and risks for both types of hospitalizations increased further at ≥10 points (Au et al., 2007; Williams et al., 2012). In addition, using 6 groups took into account differences in alcohol consumption for AUDIT-C scores—mean daily drinking and maximum drinks increase with increasing scores (Rubinsky et al., 2013). Respondents who were nondrinkers were also separated into *lifetime abstainers* and *former drinkers* based on the NHIS question, "In your entire life, have you had at least 12 drinks of any type of alcoholic beverage?" Those who responded "no," were classified as *lifetime abstainers* and those who responded "yes," but reported no past-year alcohol use were classified as *former drinkers*.

2.2.2. Binge drinking. A measure of binge drinking was based on the scoring algorithm of the third AUDIT-C question. Responses were categorized as no binge drinking, less than monthly, monthly, weekly, and daily or almost daily.

2.2.3. EQ-5D. The EQ-5D captures HRQOL in five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Respondents reported how much of a problem they experience in each domain—no problem, mild problem, or extreme problem. EQ-5D response combinations identify 243

[1] Supplementary material can be found by accessing the online version of this paper at http://dx.doi.org and by entering doi:...