NIH Public Access
Author Manuscript
Drug Alcohol Depend. Author manuscript; available in PMC 2013 January 03.

Published in final edited form as:
Drug Alcohol Depend. 2007 January 12; 86(2-3): 265–273. doi:10.1016/j.drugalcdep.2006.07.002.

"Not Getting Tanked:" Definitions of Moderate Drinking and Their Health Implications

Carla A. Green,
Center for Health Research, Kaiser Permanente Northwest, 3800 N. Interstate Avenue, Portland, OR 97227-1110, 503.335.2479 phone, 503.335.2424 fax

Michael R. Polen,
Center for Health Research, Kaiser Permanente Northwest, 3800 N. Interstate Avenue, Portland, OR 97227-1110, 503.335.6632 phone, 503.335.2424 fax

Shannon L. Janoff,
Center for Health Research, Kaiser Permanente Northwest, 3800 N. Interstate Avenue, Portland, OR 97227-1110, 503.335.6788 phone, 503.335.2424 fax

David K. Castleton, and
Center for Health Research, Kaiser Permanente Northwest, 3800 N. Interstate Avenue, Portland, OR 97227-1110, 503.335.6322 phone, 503.335.2424 fax

Nancy A. Perrin
School of Nursing, Oregon Health & Science University, 3181 S.W. Sam Jackson Park Rd., Portland, OR 97239-3098

Carla A. Green: carla.a.green@kpchr.org; Michael R. Polen: michael.polen@kpchr.org; Shannon L. Janoff: shannon.fulmer@kpchr.org; David K. Castleton: david.castleton@kpchr.org; Nancy A. Perrin: perrinn@ohsu.edu

Abstract

Background—People encounter large amounts of sometimes-inconsistent information about risks and benefits of alcohol consumption, and about what constitutes "low-risk" or "moderate" drinking.

Methods—We used 150 in-depth interviews linked to questionnaire data to learn how people define moderate drinking and to describe the relationships between definitions, attitudes, and beliefs about moderate drinking and individuals' drinking patterns.

Results—People adhere to definitions of moderate alcohol consumption that could put them, or others, at risk for short-or long-term negative consequences of drinking. Definitions that confused increased tolerance of alcohol with moderate drinking, and those that defined moderate drinking by the absence of short-term negative consequences or ability to maintain control over drinking, ignore long-term risks of heavy consumption. Individuals with risky attitudes were also more likely to report at-risk drinking practices.

Conclusions—Americans have complex beliefs about benefits and risks of alcohol consumption, and public health officials have not succeeded in conveying strong or clear messages about what constitutes low-risk drinking or about dose-response effects. Different (but more consistent) approaches to public education may be needed to increase knowledge about drinking-related risks. The prevalence of diverse norm-based definitions suggests that alternative normative information could help people reassess their own consumption.

Correspondence to: Carla A. Green, carla.a.green@kpchr.org.

$watermark-text
$watermark-text
$watermark-text

$watermark-text

$watermark-text

$watermark-text

Keywords

Alcohol Drinking; Moderate Drinking; Public Health Communications; Mixed-methods Research

1. INTRODUCTION

In recent years, many governments and national health organizations have sought to promote public guidelines for "low risk" or "sensible" drinking (Alcohol in Moderation, 2006b; Alcohol in Moderation, 2006a). "If you drink alcoholic beverages, do so in moderation," advises the USDA's *Dietary Guidelines for Americans*, which defines moderate alcohol consumption as no more than two drinks a day for men and no more than one drink a day for women (US Department of Health and Human Services & US Department of Agriculture, 2005). Other US public health bodies, such as the National Institute on Alcohol Abuse and Alcoholism (NIAAA), have adopted the USDA's guidelines as part of their definitions of low-risk drinking, but have added additional recommendations. These include weekly limits (no more than 7 drinks/week for women, 14/week for men), plus recommendations for individuals age 65 and over (not more than 1 drink/day) and to avoid binge drinking (defined as 5 or more drinks/day for men, 4 or more/day for women) (US Department of Health and Human Services & National Institute on Alcohol Abuse and Alcoholism (NIAAA), 2005). While the US guidelines are reasonably consistent with those suggested in other countries, some interesting variations exist. For example, some countries' recommended "sensible" levels (e.g., France, United Kingdom) are higher than those in the US, while other countries make recommendations for particular beverage types (e.g., Portugal's recommendations address only wine consumption, Japan's only sake) (Alcohol in Moderation, 2006b; Alcohol in Moderation, 2006a). As in other countries, these US low-risk drinking guidelines derive from research showing increased risk of negative health-related outcomes of various types, including mortality, from long-term heavier alcohol use (above 1 drink/day for women and 2 drinks/day for men) (Gunzerath et al., 2004) and from risky single occasion or heavy episodic drinking (Murgraff et al., 1999; Gunzerath et al., 2004; Dawson et al., 2005).

At the same time, researchers who study the health effects of alcohol consumption have not used consistent definitions of moderate or heavy drinking (Gunzerath et al., 2004), and these inconsistencies, in combination with media attention to both risks and benefits of alcohol consumption, can present a confusing and complicated message. Public understanding of alcohol-related risks may also be affected by underestimations of the volume of alcohol included in standard drinks (White et al., 2005) and inconsistencies in research reports about the relative benefits and harms of different types of alcoholic beverages (e.g., wine vs. spirits) (Klatsky et al., 1997; Malarcher et al., 2001; Mukamal et al., 2003; Petri et al., 2004; Theobald et al., 2000) reported by the media. Such media reports are much more likely to be in the public view than are the aforementioned government-sponsored guidelines.

Confusion may also arise from differences in the way self-reported "drinks" are defined across different countries, within countries, and between different beverage types and in different drinking settings (Lemmens, 1994). Efforts in the UK to promote sensible drinking guidelines, for example, have resulted in 80% of the public recognizing the concept of a "unit" (8 grams) of ethnaol consumed, but only half of beer or fortified wine drinkers and 61% of wine or spirits drinkers could accurately describe a unit of their preferred beverage (Lader & Meltzer, 2002). In Holland, drinks people pour at home contain higher alcohol content than the national "standard drink" (10 grams ethanol), with greater discrepancy associated with stronger beverages (Lemmens, 1994). Similarly, US college student drinkers are frequently unaware of the alcohol content of standard drinks, and also tend to pour

$watermark-text

$watermark-text

$watermark-text

drinks that exceed the size of standard US drinks (White et al., 2005). Young adults also tend to be less likely to perceive health risks associated with heavy per occasion drinking (Murgraff et al., 1999).

Raising public awareness and understanding of national drinking guidelines requires sustained public health information campaigns. The difficulty of this task is illustrated by results of a UK survey reporting that whereas 60% of respondents had heard of the guidelines, 41% of those who had heard of the guidelines could not explain what they were, and only about one-third described daily amounts that were within the guideline's recommended limits (<3–4 drinks/day for men, <2–3 drinks/day for women) (Lader & Meltzer, 2002). Yet, despite inconsistencies in information about alcohol-related risks, content of drinks, recommended drinking guidelines, and beneficial or harmful amounts of alcohol, many people report that moderate alcohol consumption has health benefits. A Canadian national survey, for example, found that 57% believed that moderate drinking could be good for one's health, and 47% or respondents defined "moderate drinking" conservatively, as less than one drink per day (Ogborne & Smart, 2001).

It is in this context that patients are asking physicians and other health care professionals about whether they should initiate or increase alcohol consumption to improve their health (Bradley & Merrill, 1999; Klatsky, 2001). Public health advocates are also urging clinicians to assess patients' drinking patterns and intervene when such patterns put individuals at risk for negative consequences of alcohol use (Whitlock et al., 2004). Yet, health care professionals may, like their patients, have misconceptions about moderate drinking. Abel and colleagues (Abel et al., 1998) found that US physicians characterized moderate drinking at levels above those suggested by the USDA for men, and did not define moderate drinking levels differently based on gender or age as suggested by the NIAAA guidelines. In contrast to US physicians, general practitioners in Finland reported *lower* thresholds (by about one-third) of consumption that would trigger their advice to reduce drinking, compared to "heavy drinking" thresholds recommended by Finnish national guidelines (Aalto & Seppa, 2001).

Given these complexities, understanding how people think about and define "moderate drinking" should help health policy-makers, clinicians, and educators frame guidelines to facilitate accurate communications about risks and benefits of alcohol consumption. Such understanding is important because inconsistencies in communication could result in the scientific community "conveying a meaningless message with respect to risk drinking (p. 1024)" (Abel & Kruger, 1995). In addition, the failure to address differences in the ways that scientists and the general public define low- vs. high-risk drinking could lead to increased cynicism and reduced adherence to low-risk drinking guidelines (Abel & Kruger, 1995). The public health importance of these issues is underscored by the large numbers of people affected: in the US in 2001–2002, despite a small decline over the previous decade, nearly 30% of the adult population reported drinking in excess of either the weekly or daily recommended limits (Dawson et al., 2004).

This paper reports results of qualitative and mixed-methods analyses identifying common themes in the ways people define and think about moderate drinking. We use questionnaire and interview data, obtained as part of a larger study of the interactions of gender, alcohol consumption, and health care service use, to learn about how people define moderate drinking, and to examine associations between drinking-related attitudes and beliefs and drinking patterns.

$watermark-text

$watermark-text

$watermark-text

2. METHODS

2.1 Study Setting

The study setting is Kaiser Permanente Northwest (KPNW), a large not-for-profit group model HMO. The HMO provides comprehensive medical, mental health, and addiction services to about 480,000 people in northwest Oregon and southwest Washington State. The demographic and health characteristics of the population in the health plan correspond closely to the characteristics of the Pacific Northwest population it serves. The study was approved by the KPNW Institutional Review Board.

2.2 Sampling And Recruitment

We interviewed 150 KPNW members who had responded to a membership survey assessing health-related practices (overall N = 7884; response rate = 54%; 4477 respondents indicated that they would be interested in participating in an interview). The interview sample was selected using survey and health plan data to represent a range of ages, drinking statuses, and health care usage patterns, and to represent women and men equally. Interview participants were recruited in this way to increase heterogeneity in the sample across these dimensions. Deliberate sampling for heterogeneity is useful when the purpose of the sampling is to identify a sample that represents a full range of responses and opinions rather than a representative sample (Blankertz, 1998). Thus, although the results reported here are not generalizable to larger populations, they should represent a wide range of existing opinions and beliefs across gender, drinking pattern, and likelihood of being present in the healthcare settings where brief interventions to reduce risky drinking have been recommended (Whitlock et al., 2004).

From April 28, 2003, through November 25, 2003, we mailed recruitment letters to 316 of the 4,477 survey respondents who agreed to be contacted for an interview. Potential participants were selected based on gender (50% women), pattern of alcohol use (5 categories), and pattern of health service use (4 categories). Letters provided information about the study and offered a $50 gift card to a local one-stop shopping center chain as reimbursement for participating in a one-hour interview. We were unable to contact 85 individuals (27%) of the 316 participants to whom we mailed letters. Of those contacted, 81 of 231 refused to complete the interview. Thus, the participation rate was 65% among contacted individuals, while overall, 47% of those we attempted to contact (150/316) gave informed consent for the interview portion of the study and participated.

2.3 Participants

Interview participants (75 women, 75 men) ranged in age from 21 to 64, with an average age of 46.2 and standard deviation of 12.4 years. As is true of the HMO's service area, the majority of interview participants were white (90%); 2% reported mixed racial heritage, 3.3% indicated that they were black or African American, 0.07% indicated that they were Asian/Pacific Islanders, and 0.07% indicated being of American Indian/Alaska Native heritage. Across reported races, 1.3% reported Hispanic ethnicity. All participants had at least 12 months of membership in the health plan prior to study inclusion.

We defined six mutually exclusive drinking status categories based on survey responses and used these categories to select interview participants. These included: 1) Lifelong abstainers (persons who had consumed fewer than 12 drinks in their lifetime); 2) Former drinkers (persons indicating that they used to drink, but no longer drink); 3) Low-risk drinkers (current drinkers who scored less than 8 on the Alcohol Use Disorders Identification Test (AUDIT) (Babor et al., 2001); averaged 1 drink or fewer per day for women and 2 drinks per day or fewer for men; and if they drank heavily at times [4 or more drinks per occasion

$watermark-text

$watermark-text

$watermark-text

for women, 5 or more drinks per occasion for men], it was less than monthly); 4) Hazardous/harmful drinkers (individuals who scored 8 or above on the AUDIT); 5) Immoderate drinkers (for women, average consumption > 7 drinks/week; for men, average consumption > 14 drinks/week; but scored below 8 on the AUDIT); and 6) Heavy episodic drinkers (response of "monthly" or "greater than monthly" on the frequency of heavy episodic drinking question [4 or more drinks per occasion for women, 5 or more drinks per occasion for men], but scored below 8 on the AUDIT and did not qualify in the category of immoderate drinkers).

Among current drinkers, these drinking categories were created to reflect the two primary dimensions of drinking-related risks addressed by NIAAA's low-risk drinking guidelines (US Department of Health and Human Services & National Institute on Alcohol Abuse and Alcoholism (NIAAA), 2005; Dawson et al., 2005). Hazardous/harmful drinking was assessed using the AUDIT—a well-established international screening tool; scores of 8 or higher indicate elevated risk for negative health and social consequences of drinking (Babor et al., 2001). Immoderate drinkers were those whose regular weekly consumption exceeded the US weekly drinking limits but who reported no other indicators of hazardous drinking (such as an AUDIT score of 8 or above). Heavy episodic (binge) drinking was defined according to the US daily drinking limits (4 or more/occasion for women, 5 or more/occasion for men); those who reported drinking in this way at least monthly were considered frequent heavy episodic drinkers. Definitions of lifelong abstainers and former drinkers were based on the definitions used in US national surveys (US Department of Health and Human Services, 1998).

Participants were also selected to represent four health care use categories, defined based on health plan records of outpatient service use in the year prior to the date the survey sample was identified. These categories included: 1) No visits (zero visits in the year prior), 2) Low use (1–9 visits in the year prior), 3) Moderate use (10–15 visits in the year prior), and 4) High use (16+ visits in the year prior). We derived these categories empirically by examining the distribution of service use among the 7884 survey respondents and looking for natural cut points in the distribution of use.

The combination of the six drinking variables and four service use variables created 24 potential pools from which we tried to recruit six participants each, balanced on gender (3 men, 3 women). We were generally successful, although some cells had fewer than six available people. When individuals in particular pools were exhausted, we sampled from the closest available pool (based on service use or drinking category, as necessary). Among men, we interviewed 11 lifelong abstainers, 16 former drinkers, 12 low-risk drinkers, 15 hazardous/harmful drinkers, 9 immoderate drinkers, and 12 heavy episodic drinkers. Among women, we interviewed 10 lifelong abstainers, 15 former drinkers, 10 low-risk drinkers, 19 hazardous/harmful drinkers, 19 immoderate drinkers, and 3 heavy episodic drinkers. Eighteen male interviewees had no health service use in the prior 12 months, 27 had low use, 18 had moderate use, and 12 had high use. Among women, 15 had no service use, 25 had low use, 15 had moderate use, and 20 had high use in the past 12 months.

2.4 Interviews

Interviews lasted an average of about 60 minutes and were conducted by trained study interviewers using a semi-structured interview guide. The interview guide contained up to 74 open-ended questions addressing a number of health-related practices (alcohol consumption, smoking, diet/weight management, and exercise). The number of questions asked depended on participants' responses and on their alcohol consumption (e.g., lifelong abstainers were not asked about current or past drinking practices). Interviewers confirmed current drinking status as part of the interview (lifelong abstainer, current drinker, former

drinker). Participants were asked what the term “moderate drinking” meant to them and also whether or not they believed moderate drinking was different for men and women. Interviews were audiotaped and transcribed.

2.5 Qualitative Analyses

We used Atlas.ti software (versions 4.2 and 5.0) (Muhr, 2004) to code transcribed versions of all interviews. The study team (including the two study interviewers) developed an initial descriptive coding scheme following review of text from multiple interviews. Once the preliminary coding scheme was developed and defined, the codes were applied, discussed, and modified. Once finalized, all codes were explicitly defined and we held weekly reliability sessions. Prior to each session each coder coded the same pre-assigned section of an interview. During sessions we discussed this text line by line to identify and resolve discrepancies. Four of the authors (CG, MP, DC, SF) and the two study interviewers coded the 150 transcripts. Intercoder reliabilities were calculated for 9 primary codes in 10% of the transcripts. Two hundred eight passages of text were reviewed; primary coders were judged to have applied codes accurately 92.8% of the time.

Once transcripts were coded, we used Atlas.ti queries to create reports of text addressing moderate drinking. We reviewed this text and developed a detailed secondary coding scheme that could be used to identify descriptive, interpretive, and pattern codes (Luborsky, 1994; Lofland & Lofland, 1995). We then generated separate queries for each new code, reviewed those reports, and abstracted themes from, and across, these codes. We identified four primary themes that we believed had important individual or public health consequences and then coded relevant text a final time for the presence or absence of each of those themes.

2.6 Exploratory Mixed-methods Analyses

Following completion of qualitative data analyses, we used Atlas.ti’s export capacity to create an SPSS dataset with binary indicators of the presence/absence of each of the four primary themes for each interview participant. We then used Chi-square tests to explore associations between drinking patterns (from the survey) and endorsement of the four primary moderate drinking themes (each Chi-square test examines one binary theme-derived variable across the six drinking categories). Because these analyses were exploratory and our power limited, we have reported both statistically significant and marginally significant results (Cohen, 1994). The following primary themes were used in Chi-square analyses as binary variables: a) moderate drinking is individually determined, b) moderate drinking equals not getting drunk, c) drinking is moderate if there are no negative consequences, and d) control over drinking equals moderate drinking. We describe and discuss these four themes in-depth, as well as sub-themes and a subset of other findings with health or public health education relevance.

3. RESULTS

Our first and most general observation was that participants voiced a very wide range of beliefs and opinions. The diversity of the themes we found suggested a widespread lack of knowledge regarding the short- and long-term health-related risks associated with drinking, and indicated that many people have not integrated information about low-risk drinking guidelines into the ways they think about and define moderate drinking. Specifics follow:

3.1 Primary Theme 1: “It’s Individually Determined”

One of our earliest observations was the pervasiveness of definitions indicating that moderate drinking varies with the individual and that determinations can, and often should,

$watermark-text $watermark-text $watermark-text

$watermark-text

$watermark-text

$watermark-text

be based on a variety of factors ranging from belief systems and family history of alcohol problems to body size and the setting in which alcohol is consumed. For example, one participant said:

> I don't listen to the media really. This just all goes back to my personal belief… [Chuckles] …but I just think that moderate means a different thing to every single person. It's all relative and it's retarded. I think in our society people don't have appropriate… Well, I just think the boundaries are different wherever you go, from belief system to belief system.

Many participants (78/150) provided definitions of moderate drinking that could be grossly categorized as "individually determined." These definitions often came up in discussions of differences in moderate drinking based on gender, and frequently addressed the size or weight of the drinker, frequently concluding that moderate drinking limits were lower for women than for men because women are smaller than men. Although such conclusions are generally correct, they were not typically paired with knowledge of low-risk consumption guidelines. For example:

> I've seen some women that could drink me under the table and keep on going, so I don't know. But, on an average, I think a man can drink more than a woman. Just because, mainly, of their size.

Chi-square analyses showed an association between respondents' drinking pattern and their beliefs that moderate drinking must be determined individually, χ^2 (5, N = 150) = 11.90, p = .04. This result appears to be driven by immoderate drinkers (those exceeding weekly drinking guidelines) who were more likely to endorse this theme than individuals with other drinking statuses.

3.2 Primary Theme 2: Moderate Drinking Equals "Not Getting Drunk"

Another important theme was a focus on the short-term consequences and physical effects of drinking, without consideration of long-term health risks. For example, 31/150 participants indicated that moderate drinking could be defined as "not getting drunk," irrespective of amount consumed:

> Men can generally handle their alcohol a little bit better. I think the same thing. If you are a guy and you go get drunk, then that's not drinking moderately. I guess moderate would be not getting tanked.

Exploratory chi-square analyses suggest that drinking status might be associated with endorsement of the theme that drinking is moderate if it does not result in drunkenness, χ^2 (5, N = 150) = 8.88, p = .11). The largest difference in these analyses was for immoderate drinkers, who were again more likely than individuals with other drinking statuses to put forth this definition.

A particularly worrisome version of this theme is illustrated in the quote below. This respondent, as well as several others, interpreted increased tolerance of alcohol (a symptom of alcohol dependence [(American Psychiatric Association, 2000)]) to indicate that a great deal could be consumed and still fit the definition of "moderate."

> They [acquaintances] were drinking so much, and what I saw them drink, I considered a lot, but they were still carrying on conversations. They weren't slurring their words. They were walking fine. Their alcohol tolerance was SO FAR up there that what's moderate for them definitely is not moderate for me. That is where I would almost have to consider it to be a gauge of how drunk you are or how drunk you get.

3.3 Primary Theme 3: Drinking is Moderate If there Are No Negative Consequences

Another common way of focusing on short-term effects was discussed by 36/150 participants. These discussions generally revolved around having no negative consequences associated with having consumed alcohol, and maintaining the ability to continue to function and act responsibly, regardless of the amount consumed. For example:

> The fact that you can still function, consciously function in whatever it is. My drinking usually involves something else that I'm doing. Whether it's dancing, bowling, whatever. …If I can continue to do what I'm there to do in the first place —whether bowling or something like that, and you're drinking at the same time—if I get to the point where I can't continue to bowl, then you've stepped over the moderate drinking. [Chuckles] You're there to drink now. You're not bowling.

Another example of the focus on short-term functional consequences illustrates lack of concern about intoxication in and of itself, and does not consider either the short-term risks (such as injuries) or the long-term effects of such patterns of drinking:

> Hmm…It is so subjective. [Pause] I guess I'd have to say a moderate drinker would be somebody who goes out occasionally on the weekends and gets intoxicated to the point where it does not interfere with their life for the rest of the weekend. So they don't get intoxicated to the point Friday night that Saturday they're completely hung over; so that they're still productive Saturday.

Chi-square analyses suggest that there may be a relationship between respondents' drinking patterns and endorsements of moderate drinking as defined by the absence of negative consequences, χ^2 (5, N = 150) = 9.11, p = .11. Frequent heavy episodic drinkers appear to be more likely to endorse this theme than other individuals.

3.4 Primary Theme 4: Control Over Drinking Equals Moderate Drinking

Our data also suggest that a subset of people know little about alcohol dependence or alcohol-related problems, particularly in comparison to low-risk drinking. These beliefs raise concerns when moderate drinking is defined as consumption that is not associated with alcohol-related problems or symptoms of alcohol dependence. For example, a number of participants (n = 19) described moderate consumption in reference to loss of control over drinking:

> I think moderate drinking means what's practiced by people that can control it; that can have a beer with supper, or whatever, and stop.

Others suggested that drinking that is not associated with problems is therefore moderate:

> When I think of moderate drinking, I think of a person who drinks, but doesn't have problems of any sort. I guess I would consider myself a moderate drinker. Yes, I drink regularly, but I don't have problems related to it. It's not like I'm an excessive drinker or an alcoholic type person where I have to drink everyday…

Similarly, the following definition first suggests a pattern of drinking that would fall within current low-risk guidelines, but then goes on to indicate that moderate drinking is also defined in relationship to a pattern more consistent with alcohol dependence:

> Moderate drinking to me means go out to dinner and have a drink with dinner or have a drink before bedtime. Once in a while, to me is moderate. When you have to start the day with a drink, and you have to have a drink with dinner, and you've got to have a drink with lunch and you have to function by drinking, that becomes a problem. That is more than moderate.

$watermark-text $watermark-text $watermark-text

$watermark-text

$watermark-text

$watermark-text

Other participants (n = 12) suggested that moderate drinking does not exist and that any drinking leads to dependence. Although such beliefs are unlikely to lead to risky drinking, they speak to a lack of knowledge about the effects of alcohol consumption, about alcohol abuse, and about alcohol dependence. For example:

> I don't believe there is moderate drinking. I don't believe it. I believe that a person could have a few drinks occasionally for a while, but it is always going to get the better of them. Maybe they could stop drinking, but I don't believe that. I don't believe the term "moderate drinking." I don't believe it should be done.

Chi-square analyses examining the relationship between drinking pattern and endorsing the idea that having control over drinking equals moderate drinking found no indications of group differences, χ^2 (5, N = 150) = 4.27, p = .51.

3.5 Other Themes with Health or Public-health Education Relevance

3.5.1 Focusing on the Long-term Benefits of Alcohol Consumption—When participants focused on long-rather than short-term outcomes of alcohol consumption, they were more likely to focus on the *benefits* of moderate drinking. If they addressed risks, they tended to discuss risks related to alcoholism rather than other long-term risks. The following quote clearly illustrates one participant's thinking about the long-term benefits of moderate drinking, but also addresses the "slippery slope" dilemma of possible negative effects of increased moderate consumption at the population level.

> It has been my observation—and I don't know if it's a medical factor or not—but there are people who have either personalities or genetic codes that the addiction process…What starts out as just a glass of wine with dinner for some people they might succeed famously for a lifetime and maybe reap the medical benefits of the one. But for other people that may be just the first step. Then it is two, then three, and then it's before dinner and after dinner.

3.1.2 Focus on Frequency Irrespective of Quantity Consumed—Although the majority of respondents (n = 103/150) included some combination of quantity of alcohol consumed and frequency of consumption in their definitions of moderate drinking, a few people were concerned only with frequency, irrespective of quantity consumed. This belief, if paired with similar behavior (as below), could have important acute and long-term health implications, including alcohol dependence. For example:

> I feel like I've seen those questionnaires like "Are you an alcoholic?" And so a lot of it is based on that for me. I think it really depends on the person. I know there are people that every day get home from work and have a beer or a glass of wine with dinner. That might work for them, but for me I binge drink occasionally but I don't drink daily. I think it just depends on the person and what works for them.

3.1.3 Extreme Anchors for Moderate and Non-Moderate Drinking—Another important facet of the way in which some people discussed alcohol consumption relates to the relatively extreme examples they provided as part of their definitions. In addition, a number of participants did not appear to understand alcohol-related risk as a dose-response relationship, but rather saw risk as related to exceeding a threshold. The following example illustrates both the "threshold" theme and an example of the extremes used to describe risks:

> Respondent: I think if somebody, especially some older people, if they had three ounces of wine or something it might actually be good for them.
>
> Interviewer: Is that per day or per week?

$watermark-text

$watermark-text

$watermark-text

> Respondent: Like in the evening with their meals, because it is good for your blood in a strange way. It can help some people rest, but if you're drinking thirty ounces then you're getting into a trouble spot.

Such threshold-based viewpoints may be unintended consequences of threshold-based legal blood alcohol limits for driving and operating other machinery. General discussions of dose-response related risk or a dose-response continuum were rare.

3.1.5 Normative Definitions—Another theme we encountered was the use of some kind of normative definition to situate, understand, and define acceptable moderate alcohol consumption. Normative explanations sometimes included definitions tied to an appropriate type of drink (e.g., wine is OK, spirits are not), irrespective of alcohol content. They also were tied to situations or settings in which people drink (social drinking is OK, drinking alone is not), irrespective of amount consumed, and to notions about acceptable reasons for drinking (drinking just to drink is OK, drinking because you need to relax is not OK). Other participants cited their own drinking pattern, their friends' drinking patterns, or consuming less than they had consumed earlier in their lives as their definitions of moderate drinking again, these references often appear to be unrelated to actual amount of alcohol consumed. Another interesting normative aspect of participants' definitions arose in discussions regarding gender differences in definitions of moderate drinking. A small subset of people indicated that women drinking beer or spirits were not drinking moderately. There was an interesting additional dimension in this gender-based theme—a few participants indicated that because women should be considered men's equals, definitions about moderate drinking *should* be the same for both genders. Examples of a few of these normative themes follow:

> Interviewer: What does the term "moderate drinking" mean to you?
>
> Respondent: Less than I drink. Moderate drinking is more like social drinking. That is where you don't drink just because you're stressed. You don't drink just because it's a nice day and you're finally off work. You drink because you're at a gathering and people are drinking and wanting to have a fun time maybe once a month…

The following illustrates comparisons to prior behavior for a participant whose personal comparison consumption norm is very high:

> I suppose that depends on the person. For me, instead of buying a case of 24, going to a 6-pack or a 12-pack could be moderate if it were a weekend or a day off.

Similarly, the following quote illustrates both the normative comparison and the individually determined definitions of moderate drinking:

> So when you hear moderate, if you're a drinker, moderate to you doesn't mean the same thing as moderate to somebody else [laughs] …And so to me that's not a good phrase…you have to be more specific and tell people a little bit better what that really means, because people that are lonely or people that are alcoholics, they don't see moderate in the same way that I would see moderate.

The following passage illustrates how norms related to gender and equality can come into play in definitions of moderate drinking.

> Interviewer: Do you see any difference between moderate drinking for men and women?
>
> Respondent: No. I think a woman should be treated equal. I think they should be paid equal…I think a woman should be your friend. I think they should be treated equal and it just PISSES me off - excuse me. It makes me very upset when people treat women less than what they should be.

$watermark-text

$watermark-text

$watermark-text

> Interviewer: So you don't see a difference in terms of moderate drinking for men or women? That's sort of how we got on that subject.
>
> Respondent: No. I mean, if a woman wants to stop and have a couple of beers and go home, two beers is not gonna mess you up or affect your driving. What's the difference for a man or a woman? Exactly the same thing.

This participant illustrates confusion about social equality and physiological equality. In fact, research suggests that the effect of two drinks *is* different for men and women, including for acute, injury-related consequences (Stockwell et al., 2002).

3.1.6 Complex Responses—Finally, a number of participants also reported more complex ways of thinking about moderate drinking, some of which were very sophisticated. For example, some indicated that risks were a function of height and weight, genetics, familial history of alcohol problems, or a combination of these factors. Those who endorsed these kinds of definitions tended to discount or ignore simple recommendations.

> Interviewer: Do you see a difference when it comes to men and women moderate drinking for men versus moderate drinking for women?
>
> Respondent: No. Why? [Chuckles.] I mean, people are different. I've seen some women who can handle it and probably have had more than they should, in my opinion, but they have it together. Versus the guy sitting on the other side of the table has just had a glass and he's an ass; and vice versa. It's body weight; it's a whole lot of things. Frame of mind. Everything can affect your reaction to alcohol. It isn't just a matter of I am 220 pounds and that means I can have this much to drink, because one day you might have half that amount and be on your you know what. So, no.

4. DISCUSSION

We found evidence suggesting that a wide range of people adhere to definitions of moderate alcohol consumption that could put them, or others, at risk for short- or long-term negative consequences of drinking. In particular, definitions that confused increased tolerance of alcohol with moderate drinking, and those that defined moderate drinking as the absence of short-term negative consequences or upon the ability to maintain control over drinking, have important health implications because they ignore long-term risks associated with heavy consumption (US Department of Health and Human Services & National institute on Alcohol Abuse and Alcoholism, 2000). These results raise particular concerns because exploratory analyses suggest that some of these risky beliefs may be associated with risky patterns of alcohol consumption.

We were also struck by the commonalities of our findings and those of Midanik's study of definitions of drunkenness (Midanik, 2003). Significant numbers of our respondents defined moderate drinking as *not* experiencing what Midanik's participants described as drunkenness. This illustrates the relatively black-and-white ways people think about drinking—as non-problematic or problematic—without attending to the increased risk associated with higher consumption that does not result in short-term negative consequences or drunkenness.

Our results also suggest that people have complex beliefs about the benefits and risks of alcohol consumption, and that public health officials in the US have not yet succeeded in conveying strong or clear messages about what constitutes low- vs. high-risk drinking or about dose-response effects. Unlike knowledge about tobacco-related risks, information about alcohol-related risks and benefits appears to have become muddled for many people.

$watermark-text

$watermark-text

$watermark-text

This confusion may be a result of hearing about risks *and* benefits, or because the messages Americans have received about risky drinking are inconsistent. A decade ago, Abel and Kruger (Abel & Kruger, 1995) warned that inconsistencies in public health messages could produce this kind of confusion.

Similarly, although more than 50% of American adults have a close family member who is struggling with or has had alcoholism in the past (Dawson & Grant, 1998), we found few people who appeared to understand the symptoms of alcohol dependence. More importantly, significant numbers of people suggested that increased tolerance had changed their definitions of moderate drinking to include much higher levels of consumption.

At the same time, frequent “it’s individually determined” answers may indicate that, for many people, more complicated guidelines may not only be understandable, but may also be less likely to be brushed off as too simplistic. Finally, the prevalence of diverse norm-based definitions of moderate drinking suggests that providing people with alternative normative information could help them reinterpret their own patterns of consumption.

Taken together, this preliminary work suggests that there may be significant need for additional public education about the health effects of alcohol consumption and about the signs and symptoms of alcohol-related disorders. If our findings are replicated in larger samples, public health educators might address some of the risky beliefs and misinformation we found in our interviews, and work to provide more detailed information about risks associated with different patterns of alcohol consumption. In particular, no one in our sample discussed gender differences in susceptibility to the negative consequences of drinking that result from differences in the ways that women metabolize alcohol, or talked about the relatively higher blood alcohol levels found among women, compared to similarly sized men, when equal amounts of alcohol are consumed (c.f., (Baraona et al., 2001); (Dawson & Archer, 1993); (Lieber, 1997), and (Graham et al., 1998)). Rather, participants tended to focus on size or weight, irrespective of gender. Although such a focus is partially warranted, these definitions present an incomplete picture of actual risk. In combination with research suggesting that individuals strongly underestimate their own alcohol-related risks, particularly women (Sjoberg, 1998), this apparent lack of understanding of gender differences in dose-related risk, and of dose-related risk more generally, further raises concerns. Given the relatively complex ways that many people defined moderate drinking and tendencies to discount simple answers, providing clear and more complete information may produce better understanding of alcohol-related risks.

In sum, these results raise concerns regarding how the US public thinks about and defines moderate drinking. Different approaches to public education campaigns may be needed to increase knowledge about drinking-related risks.

4.1 Limitations

We selected our sample to increase heterogeneity among our participants. As such, our results should not be seen as representative of a population. Rather, they could be more reasonably interpreted as representing viewpoints from a wide variety of men and women with varying drinking patterns and patterns of health care service use. Similarly, we did not have large numbers of participants with different ethnic backgrounds, so our results may not apply to such individuals. We also had limited power to conduct statistical analyses. As such, we chose to report results that had marginal statistical significance. Future research efforts should assess the prevalence and correlates of the beliefs we found using larger samples; additional exploratory work is likely needed among individuals from different ethnic backgrounds.

$watermark-text

$watermark-text

$watermark-text

Finally, we did not attempt to assess the validity of US or other national guidelines for low-risk or moderate drinking, and did not attempt to compare the validity of participants' definitions of moderate drinking with the validity of the guidelines. Risks of developing alcohol use disorders in relation to the exceeding US drinking guidelines have been demonstrated by others (Dawson et al., 2005), and a recent comprehensive review of the potential health benefits of moderate drinking is available (Gunzerath et al., 2004). Conversely, investigations of alcohol consumption and health care use continue to report inconsistent associations between drinking patterns and short-term health care utilization and costs (Anzai et al., 2005; Zarkin et al., 2004; McMillan & Lapham, 2004; Polen et al., 2001; Terry et al., 1998; Rice et al., 2000; Hunkeler et al., 2001). Additional research addressing these inconsistencies would be useful.

Acknowledgments

The authors would like to thank interviewers Alison Firemark and Kevin Rogers for their contribution to the project, analyst Elizabeth Shuster for her analytic support, and Martha Swain for editing assistance. This work was supported by US National Institute on Alcohol Abuse and Alcoholism grant #R01 AA13167.

6. Reference List

Aalto M, Seppa K. At which drinking level to advise a patient? General practitioners' views. Alcohol Alcohol. 2001; 36:431–433. [PubMed: 11524310]

Abel EL, Kruger ML. Hon v. Stroh Brewery Company: what do we mean by "moderate" and "heavy" drinking? Alcoholism, Clinical and Experimental Research. 1995; 19:1024–1031.

Abel EL, Kruger ML, Friedl J. How do physicians define "light," "moderate," and "heavy" drinking? Alcohol Clin Exp Res. 1998; 22:979–984. [PubMed: 9726266]

Alcohol in Moderation. Drinking & You: Consumer sites about sensible drinking, national government guidelines and your health for the United Kingdom, United States of America, Canada, La France, Espana and Deutschland. 2006a. http://www.drinkingandyou.com/ [Online]. Available: http://www.drinkingandyou.com

Alcohol in Moderation. Drinking & You: Sensible drinking. 2006b. http://www.drinkingandyou.com/ [Online]. Available: http://www.drinkingandyou.com/site/uk/biggy.htm

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth edititon Text Revision (DSM-IV-TR). 1. Washington, DC: American Psychiatric Association; 2000.

Anzai Y, Kuriyama S, Nishino Y, Takahashi K, Ohkubo T, Ohmori K, et al. Impact of alcohol consumption upon medical care utilization and costs in men: 4-year observation of National Health Insurance beneficiaries in Japan. Addiction. 2005; 100:19–27. [PubMed: 15598185]

Babor, TF.; Higgins-Biddle, JC.; Saunders, JB.; Monteiro, MG. AUDIT: The Alcohol Use Disorders Identification Test. Guidelines for use in primary care. 2. World Health Organization; 2001. p. 1-40.Ref Type: Serial (Book,Monograph)

Baraona E, Abittan CS, Dohmen K, Moretti M, Pozzato G, Chayes ZW, et al. Gender differences in pharmacokinetics of alcohol. Alcoholism, Clinical and Experimental Research. 2001; 25:502–507.

Blankertz L. The value and practicality of deliberate sampling for heterogeneity: A critical multiplist perspective. American Journal of Evaluation. 1998; 19:307–324.

Bradley KA, Merrill JO. Doctor, is wine good for my heart? Lancet. 1999; 353:1815–1816. [PubMed: 10359402]

Cohen J. The earth is round ($p < .05$). American Psychologist. 1994; 49:997–1003.

Dawson DA, Archer LD. Relative frequency of heavy drinking and the risk of alcohol dependence. Addiction. 1993; 88:1509–1518. [PubMed: 8286996]

Dawson DA, Grant BF. Family history of alcoholism and gender: their combined effects on DSM-IV alcohol dependence and major depression. Journal of Studies on Alcohol. 1998; 59:97–106. [PubMed: 9498321]

Dawson DA, Grant BF, Li TK. Quantifying the risks associated with exceeding recommended drinking limits. Alcoholism, Clinical and Experimental Research. 2005; 29:902–908.

$watermark-text

$watermark-text

$watermark-text

Dawson DA, Grant BF, Stinson FS, Chou PS. Toward the attainment of low-risk drinking goals: a 10-year progress report. Alcoholism, Clinical and Experimental Research. 2004; 28:1371–1378.

Graham K, Wilsnack R, Dawson D, Vogeltanz N. Should alcohol consumption measures be adjusted for gender differences? Addiction. 1998; 93:1137–1147. [PubMed: 9813895]

Gunzerath L, Faden V, Zakhari S, Warren K. National Institute on Alcohol Abuse and Alcoholism report on moderate drinking. Alcoholism, Clinical and Experimental Research. 2004; 28:829–847.

Hunkeler EM, Hung YY, Rice DP, Weisner C, Hu T. Alcohol consumption patterns and health care costs in an HMO. Drug Alcohol Depend. 2001; 64:181–190. [PubMed: 11543988]

Klatsky AL. Should patients with heart disease drink alcohol? Journal of the American Medical Association. 2001; 285:2004–2006. [PubMed: 11308439]

Klatsky AL, Armstrong MA, Friedman GD. Red wine, white wine, liquor, beer, and risk for coronary artery disease hospitalization. American Journal of Cardiology. 1997; 80:416–420. [PubMed: 9285651]

Lader, D.; Meltzer, H. Drinking: Adult's behaviour and knowledge in 2002. London: Office for National Statistics; 2002.

Lemmens PH. The alcohol content of self-report and 'standard' drinks. Addiction. 1994; 89:593–601. [PubMed: 8044126]

Lieber, CS. Gender differences in alcohol metabolism and susceptibility. In: Wilsnack, RW.; Wilsnack, SC., editors. Gender and Alcohol: Individual and Social Perspectives. New Brunswick, New Jersey: Rutgers Center of Alcohol Studies; 1997. p. 77-89.

Lofland, J.; Lofland, LH. Analyzing social settings: a guide to qualitative observation and analysis. 3. New York: Wadsworth Publishing; 1995.

Luborsky, MR. The identification and analysis of themes and patterns. In: Gubrium, J.; Sankar, A., editors. Qualitative methods in aging research. New York: Sage Publications; 1994. p. 189-210.

Malarcher AM, Giles WH, Croft JB, Wozniak MA, Wityk RJ, Stolley PD, et al. Alcohol intake, type of beverage, and the risk of cerebral infarction in young women. Stroke. 2001; 32:77–83. [PubMed: 11136918]

McMillan GP, Lapham SC. Does moderate alcohol use affect health-care costs? A propensity analysis of female health-care workers. Addiction. 2004; 99:612–620. [PubMed: 15078236]

Midanik LT. Definitions of drunkenness. Substance Use & Misuse. 2003; 38(9):1285–303. [PubMed: 12908812]

Muhr, T. User's Manual for ATLAS.ti 5.0 [Computer software]. Berlin: ATLAS.ti Scientific Software Development GmbH; 2004.

Mukamal KJ, Conigrave KM, Mittleman MA, Camargo CA Jr, Stampfer MJ, Willett WC, et al. Roles of drinking pattern and type of alcohol consumed in coronary heart disease in men. New England Journal of Medicine. 2003; 348:109–118. [PubMed: 12519921]

Murgraff V, Parrott A, Bennett P. Risky single-occasion drinking amongst young people--definition, correlates, policy, and intervention: a broad overview of research findings. Alcohol and Alcoholism. 1999; 34:3–14. [PubMed: 10075396]

Ogborne AC, Smart RG. Public opinion on the health benefits of moderate drinking: results from a Canadian National Population Health Survey. Addiction. 2001; 96:641–649. [PubMed: 11300968]

Petri AL, Tjonneland A, Gamborg M, Johansen D, Hoidrup S, Sorensen TI, et al. Alcohol intake, type of beverage, and risk of breast cancer in pre- and postmenopausal women. Alcoholism, Clinical and Experimental Research. 2004; 28:1084–1090.

Polen MR, Green CA, Freeborn DK, Mullooly JP, Lynch F. Drinking patterns, health care utilization, and costs among HMO primary care patients. Journal of Behavioral Health Services and Research. 2001; 28:378–399. [PubMed: 11732242]

Rice DP, Conell C, Weisner CM, Hunkeler EM, Fireman B, Hu TW. Alcohol drinking patterns and medical care use in an HMO setting. Journal of Behavioral Health Services and Research. 2000; 27:3–16. [PubMed: 10695237]

Sjoberg L. Risk perception of alcohol consumption. Alcoholism, Clinical and Experimental Research. 1998; 22:277S–284S.

Stockwell T, McLeod R, Stevens M, Phillips M, Webb M, Jelinek G. Alcohol consumption, setting, gender and activity as predictors of injury: A population-based case-control study. Journal of Studies on Alcohol. 2002; 63:372–379. [PubMed: 12086138]

Terry PE, Fowler EJ, Fowles JB. Are health risks related to medical care charges in the short-term? Challenging traditional assumptions. American Journal of Health Promotion. 1998; 12:340–347. [PubMed: 10181144]

Theobald H, Bygren LO, Carstensen J, Engfeldt P. A moderate intake of wine is associated with reduced total mortality and reduced mortality from cardiovascular disease. J Stud Alcohol. 2000; 61:652–656. [PubMed: 11022802]

US Department of Health and Human Services & National institute on Alcohol Abuse and Alcoholism. Tenth Special Report to the US Congress on Alcohol and Health. 2000. (Rep. No. NIH Publication No. 00-1583)

US Department of Health and Human Services & National Institute on Alcohol Abuse and Alcoholism (NIAAA). Helping patients who drink too much: A clinician's guide, 2005 Edition. 2005.

US Department of Health and Human Services & US Department of Agriculture. Dietary guidelines for Americans, 2005. 6. Washington, DC: US Government Printing Office; 2005.

US Department of Health and Human Services, N. I. o. H. N. I. o. A. A. a. A. Drinking in the United States: Main findings from the 1992 national longitudinal alcohol epidemiologic survey (NLAES). Bethesda, Maryland: National Institutes of Health; 1998.

White AM, Kraus CL, Flom JD, Kestenbaum LA, Mitchell JR, Shah K, et al. College students lack knowledge of standard drink volumes: implications for definitions of risky drinking based on survey data. Alcoholism, Clinical and Experimental Research. 2005; 29:631–638.

Whitlock EP, Polen MR, Green CA, Orleans T, Klein J. Behavioral counseling interventions in primary care to reduce risky/harmful alcohol use by adults: a summary of the evidence for the U.S. Preventive Services Task Force. Annals of Internal Medicine. 2004; 140:557–568. [PubMed: 15068985]

Zarkin GA, Bray JW, Babor TF, Higgins-Biddle JC. Alcohol drinking patterns and health care utilization in a managed care organization. Health Services Research. 2004; 39:553–570. [PubMed: 15149478]

$watermark-text

$watermark-text

$watermark-text