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Alcohol consumption, at-risk and heavy episodic drinking with consideration of injuries and alcohol-specific medical advice

Results of the German Health Interview and Examination Survey for Adults (DEGS1)

Background and purpose

With a per capita consumption of 9.6 l of pure alcohol, Germany ranks among the countries with the highest alcohol consumption [1]. In men, 12.8% of disability adjusted life years are caused by alcohol consumption [2]. The economic cost of alcohol-associated diseases is estimated at 26.7 billion € for the year 2007 [3]. Whereas at-risk drinking over the course of many years is associated with the development of chronic diseases, such as liver disorders and pancreatitis, the risk of injury is higher throughout the entire drinking life among individuals with hazardous consumption, in particular, heavy episodic drinking [4, 5, 6, 7]. At-risk drinking is defined as a daily average consumption of 10–12 g or more of pure alcohol for women and 20–24 g or more of pure alcohol for men [8], whereas heavy episodic drinking refers to occasional excessive drinking [9]. The World Health Organization (WHO) estimates that half of all alcohol-related deaths are as a result of injuries [10]. Alcohol-specific medical advice in the context of primary health care plays an important role in the early detection and intervention of hazardous consumption [5, 6].

In addition to the per capita alcohol consumption, regular data collection on different drinking patterns in the German population is an important part of the continuous health monitoring carried out on behalf of the Federal Ministry of Health. This data is collected partly in the context of specialised surveys of substance abuse [11] and partly through the health monitoring system at the Robert Koch Institute (RKI) [12]. As part of this system, alcohol consumption is assessed in the regular German Health Update (GEDA) surveys [13]. In addition, the German Health Interview and Examination Survey for Adults (DEGS) offers the possibility of examining more closely the link between alcohol consumption and health problems.

The prevalence of at-risk drinking and heavy episodic drinking recorded in DEGS1 is reported in this article. Due to the important public health relevance of alcohol-attributable injuries in countries with high per capita alcohol consumption such as Germany, associations with injuries and poisoning incidents are also analysed [2]. As the primary health care sector offers the possibility of secondary prevention of alcohol use disorders [5, 14], information is provided on how often advice on alcohol consumption is provided during visits to general practitioners/specialists and outpatient departments.

Methods

The German Health Interview and Examination Survey for Adults ("Studie zur Gesundheit Erwachsener in Deutschland", DEGS) is part of the health monitoring system at the Robert Koch Institute (RKI). The concept and design of DEGS are described in detail elsewhere [12, 15, 16, 17, 18]. The first wave (DEGS1) was conducted from 2008–2011 and comprised interviews, examinations and tests [19, 20]. The target population comprises the residents of Germany aged 18–79 years. DEGS1 has a mixed design which permits both cross-sectional and longitudinal analyses. For this purpose, a random sample from local population registries was drawn to complete the participants of the "German National Health Interview and Examination Survey 1998" (GNHIES98). A total of 8,152 individuals participated, including 4,193 first-time participants (response rate 42%) and 3,959 revisiting participants of GNHIES98 (response rate 62%). In all 7,238 individuals attended one of the 180 examination centres, and 914 were interviewed only. The net sample (n=7,988) permits representative cross-sectional and time trend analyses for the age range of 18–79 years in comparison with GNHIES98 (n=7,124) [21]. The data of the revisiting participants can be used for longitudinal analyses.

Tab. 1 Prevalence of at-risk drinking according to AUDIT-C by sex, age group and socioeconomicstatus (***SES***). n=7,591 [unweighted]

Age group	18–29 years	30–44 years	45–64 years	65–79 years	Total
Women	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Low SES	29.4 (21.6–38.7)	15.2 (8.3–26.2)	19.3 (13.9–26.0)	10.8 (6.6–17.2)	18.5 (15.2–22.4)
Middle SES	41.0 (34.8–47.4)	24.4 (20.0–29.4)	23.9 (20.7–27.5)	18.9 (15.1–23.5)	26.3 (23.9–28.8)
High SES	26.5 (17.4–38.2)	28.8 (22.3–36.3)	32.8 (27.2–38.9)	32.8 (24.4–42.5)	30.5 (26.8–34.5)
Total	36.0 (31.8–40.5)	24.6 (21.0–28.5)	25.0 (22.4–27.7)	18.0 (15.1–21.4)	25.6 (23.8–27.5)
Men					
Low SES	49.7 (37.5–61.9)	28.7 (20.4–38.7)	36.9 (28.7–45.9)	31.6 (22.5–42.4)	37.3 (32.5–42.3)
Middle SES	55.3 (49.1–61.4)	43.1 (37.3–49.1)	40.1 (35.1–45.3)	34.9 (29.9–40.2)	43.2 (40.4–46.1)
High SES	56.9 (43.1–69.7)	36.6 (29.4–44.4)	42.5 (36.6–48.5)	35.8 (28.0–44.4)	41.2 (36.7–45.9)
Total	54.2 (49.4–58.9)	38.8 (34.9–42.9)	40.0 (36.6–43.5)	34.4 (30.4–38.7)	41.6 (39.5–43.6)

Tab. 2 Prevalence of heavy episodic drinking[a] by sex, age group and socioeconomic status (***SES***). n=7,675 [unweighted]

Age group	18–29 years	30–44 years	45–64 years	65–79 years	Total
Women	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Low SES	22.5 (15.5–31.5)	7.1 (2.9–16.2)	8.0 (4.8–12.8)	6.3 (3.3–11.8)	10.7 (8.2–14.0)
Middle SES	22.5 (17.8–28.2)	10.9 (8.4–14.1)	7.6 (5.8–9.9)	8.1 (5.6–11.7)	11.3 (9.6–13.1)
High SES	10.3 (5.5–18.3)	7.9 (5.1–11.9)	9.0 (6.0–13.4)	7.6 (3.9–14.5)	8.7 (6.7–11.2)
Total	20.7 (17.3–24.7)	10.1 (8.0–12.6)	7.9 (6.5–9.6)	7.5 (5.5–10.3)	10.8 (9.6–12.2)
Men					
Low SES	43.0 (32.3–54.5)	30.1 (20.6–41.7)	30.4 (22.5–39.6)	21.0 (13.4–31.3)	31.5 (26.8–36.5)
Middle SES	47.9 (41.3–54.6)	33.7 (28.3–39.6)	27.1 (22.3–32.5)	24.9 (19.9–30.6)	32.8 (29.9–35.9)
High SES	54.3 (40.7–67.3)	24.4 (18.1–32.0)	22.4 (17.8–27.9)	17.2 (12.0–23.9)	26.2 (22.5–30.3)
Total	47.7 (42.7–52.7)	30.2 (26.4–34.4)	26.6 (23.2–30.2)	22.5 (18.9–26.6)	31.0 (28.9–33.2)

[a]At least once per month.

The cross-sectional and trend analyses are conducted with a weighting factor which corrects deviations in the sample from the population structure (as of 31 Dec 2010) with regard to age, sex, region and nationality, as well as community type and education [16]. A separate weighting factor was prepared for the examination part. Calculation of the weighting factor also considered re-participation probability of GNHIES98 participants, based on a logistic regression model. For the purpose of conducting trend analyses, the data from the GNHIES98 were age-adjusted to the population level as of 31 Dec 2010. A non-response analysis and a comparison of selected indicators with data from census statistics indicate a high level of representativity of the net random sample for the residential population aged 18–79 years of Germany [21]. To take into account the weighting as well as the correlation of participants within community, the confidence intervals were determined with SPSS-20 procedures for complex samples. Differences are regarded as statistically significant if the respective 95% confidence intervals do not overlap.

At-risk drinking was assessed in the self-administered questionnaire with the three questions of the German adaption of the Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) [22]. Based on a comprehensive review, the conclusion of the Primary Health Care European Project on Alcohol (PHEPA, http://www.phepa.net) is that AUDIT-C is the most suitable tool for identifying hazardous alcohol consumption. The maximum total score of the AUDIT-C is 12. A score of >3 for women and >4 for men were considered as at-risk drinking [23, 24]. Heavy episodic drinking was assessed with the third question. Those who responded to drink six or more alcoholic standard drinks on a single occasion at least once a month were considered heavy episodic drinkers.

Socioeconomic status (SES) was determined using an index which includes information on school education and vocational training, professional status and net household income (weighted by household needs) and which enables classification into low, middle and high status groups [25].

Injuries were assessed in the self-administered questionnaire with the question: "Have you had any injuries or poisoning incidents requiring medical treatment in the last 12 months?"

Medical advice, together with a list of reasons for advice, was assessed with the question: "Have you received advice on your health behaviour during a visit to a general practitioner/specialist or outpatient department in the last 12 months?" If this question was answered with yes, the participant was asked what the reason for the advice was, with alcohol consumption being one of the possible reasons.

Results

The prevalence of at-risk drinking according to AUDIT-C is shown in **Tab. 1**. At-risk drinking is most common among young individuals aged from

19–29 years, and least common in the age group from 65–79 years. At-risk drinking occurs more often in men than women. In women, at-risk drinking is associated with higher SES.

Heavy episodic drinking is three times more common in men than in women (**Tab. 2**). In both men and women, heavy episodic drinking is most common in the age group from 18–29 years and is less common with age after this time. In contrast to at-risk drinking, heavy episodic drinking in women is not associated with higher SES.

Men with at-risk or heavy episodic drinking have a significant higher risk of injuries in the 12 months prior to the survey (**Tab. 3**). A similar non-significant trend is apparent in women. The risk of injury is highest in the age group from 18–29 years in combination with at-risk or heavy episodic drinking and then decreases with age. The risk of injury in combination with at-risk and heavy episodic drinking does not vary considerably according to SES. However, heavy episodic drinkers with a high SES have more frequent injuries. Particularly, as individuals with a high SES and without heavy episodic drinking have a relatively low risk of injury.

Individuals with at-risk or heavy episodic drinking were given advice on their alcohol consumption during visits to general practitioners/specialists or outpatient departments in the last 12 months more frequently than individuals without these drinking patterns (**Tab. 4**). The chance of receiving an alcohol-specific medical advice is approximately three times as high in men and twice as high in women with these drinking patterns than in those without these drinking patterns. At-risk drinkers receive advice significantly more frequently in the age group from 45–64 years. In the age group from 30–44 years, medical advice is more common only for heavy episodic drinkers, not for at-risk drinkers. Advice on alcohol consumption is given less frequently to those in the age group from 18–29 years than in the other age groups. In the age group from 65 years, the figures relating to medical advice were too low to allow a meaningful interpretation. The higher the SES, the less frequently he or she is to receive medical advice on alcohol consumption.

Abstract · Zusammenfassung

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Alcohol consumption, at-risk and heavy episodic drinking with consideration of injuries and alcohol-specific medical advice. Results of the German Health Interview and Examination Survey for Adults (DEGS1)

Abstract

The German Health Interview and Examination Survey for Adults (DEGS1) was conducted from 2008–2011 and comprised interviews, examinations and tests. The target population was the resident population of Germany aged from 18–79 years (n=8,152). Data on alcohol consumption, at-risk drinking and heavy episodic drinking was collected in a self-administered questionnaire with the Alcohol Use Disorders Identification Test–Consumption (AUDIT-C). At-risk drinking is most common among young individuals aged from 19–29 years (men 54.9%; women 36%), becoming less common from an age of 65 years. With 41.6%, at-risk drinking is more prevalent in men than in women (25.6%). Men are three times more likely to be heavy episodic drinkers than women. Injuries are more common among individuals with at-risk or heavy episodic drinking. They receive advice on alcohol consumption during visits to general practitioners/specialists or outpatient departments more often than individuals without these drinking patterns.

Keywords

Alcohol consumption · At-risk drinking · Heavy episodic drinking · General population · Health survey

Riskanter Alkoholkonsum und Rauschtrinken unter Berücksichtigung von Verletzungen und der Inanspruchnahme alkoholspezifischer medizinischer Beratung. Ergebnisse der Studie zur Gesundheit Erwachsener in Deutschland (DEGS1)

Zusammenfassung

Die Studie zur Gesundheit Erwachsener in Deutschland (DEGS1) wurde von 2008 bis 2011 durchgeführt und umfasste Befragungen, Untersuchungen und Tests. Zielpopulation war die in Deutschland lebende Bevölkerung im Alter von 18 bis 79 Jahren (N=8152). Daten zum Alkoholkonsum, Risikokonsum und Rauschtrinken wurden im Selbstausfüllfragebogen mit dem Alcohol Use Disorder Identification Test – Consumption (AUDIT-C) erhoben. Am häufigsten ist der Risikokonsum bei jüngeren Menschen im Alter von 19 bis 29 Jahren (Männer 54,9%; Frauen 36%). Im Alter ab 65 Jahren nimmt die Häufigkeit ab. Bei Männern ist der Risikokonsum mit 41,6% häufiger als bei Frauen (25,6%). Das Rauschtrinken ist bei Männern dreimal so häufig wie bei Frauen. Verletzungen sind bei Personen mit Risikokonsum und Rauschtrinken häufiger. Sie werden bei Arztpraxis- oder Ambulanzbesuchen häufiger zum Alkoholkonsum beraten als Personen ohne diese Trinkmuster.

Schlüsselwörter

Alkoholkonsum · Riskanter Alkoholkonsum · Rauschtrinken · Allgemeinbevölkerung · Gesundheitssurvey

Discussion

Initial results on alcohol consumption, at-risk and heavy episodic drinking from DEGS1 are reported in this contribution. The results confirm that at-risk and heavy episodic drinking are very common in the German population. The results are consistent with the results of previous population-based studies on alcohol consumption. It is interesting to note that a higher prevalence of at-risk drinking across all subgroups is apparent in comparison with the German Health Update (GEDA), although the same measurement was used (AUDIT-C) [26]. The differences in prevalence (comparison between DEGS1 and GEDA 2010) exist for both men and women. For women, the difference amounts to 4% in the age groups from 18–64 years, while there is no difference in the age group from 65 years. For men, the difference is high-

Tab. 3 Prevalence of injuries in combination with at-risk or heavy episodic drinking[a] by sex, age group and socioeconomic status (*SES*)

	At-risk drinking n=7,569 (unweighted)		Heavy episodic drinking n=7,649 (unweighted)	
	Yes	No	Yes	No
Sex	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Women	9.8 (7.7–12.5)	8.4 (7.3–9.6)	12.3 (8.6–17.3)	8.5 (10.9–14.3)
Men	16.5 (14.3–19.0)	12.3 (10.6–14.2)	17.2 (14.6–20.2)	12.5 (10.9–14.3)
Age group				
18–29 years	22.5 (18.1–27.5)	14.7 (11.8–18.1)	23.4 (18.6–29.1)	15.4 (12.7–18.6)
30–44 years	13.4 (10.2–17.5)	10.0 (8.1–12.4)	15.7 (11.5–21.1)	10.1 (8.3–12.4)
45–64 years	9.9 (7.7–12.7)	10.3 (8.8–12.0)	12.1 (8.8–16.4)	9.7 (8.4–11.1)
65–79 years	9.1 (6.5–12.6)	6.1 (4.7–7.9)	7.0 (4.1–11.7)	7.2 (5.8–9.0)
Socioeconomic status	n=7,539 (unweighted)		n=7,619 (unweighted)	
Low SES	14.3 (9.9–20.1)	9.4 (7.0–12.4)	15.6 (10.8–22.1)	9.4 (7.2–12.2)
Middle SES	14.5 (12.3–16.9)	11.0 (9.8–12.4)	15.6 (12.9–18.8)	11.3 (10.2–12.6)
High SES	12.4 (9.5–16.1)	8.1 (6.5–10.1)	17.7 (13.0–23.7)	7.9 (6.5–9.7)
Total	14.0 (12.3–15.8)	10.1 (9.2–11.1)	15.9 (13.6–18.5)	10.2 (9.4–11.1)

[a]At least once per month.

Tab. 4 Frequency of medical advice with and without at-risk or heavy episodic drinking[a] by sex, age group and socioeconomic status (*SES*)

	At-risk drinking n=1,233 (unweighted)		Heavy episodic drinking n=1,241 (unweighted)	
	Yes	No	Yes	No
Sex 1233/1241	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Women	5.5 (2.5–12.0)	3.6 (1.9–6.7)	8.4 (2.9–22.3)	3.6 (2.0–6.2)
Men	15.2 (9.9–22.6)	5.2 (3.1–8.5)	16.7 (10.5–25.6)	5.8 (3.7–9.0)
Age group				
18–29 years	7.4 (3.2–15.9)	4.8 (1.9–11.3)	8.2 (3.3–18.7)	4.7 (2.1–10.4)
30–44 years	12.8 (6.7–23.2)	3.9 (1.9–8.1)	18.3 (9.4–32.7)	3.6 (1.9–6.7)
45–64 years	14.5 (8.9–22.8)	4.5 (2.7–7.4)	19.6 (11.4–31.6)	5.1 (3.2–8.1)
65–79 years	n.a.	n.a.	n.a.	n.a.
Socioeconomic status	n=1230 (unweighted)		n=1238 (unweighted)	
Low SES	19.2 (9.4–35.2)	6.0 (2.3–14.8)	25.8 (13.0–44.7)	4.6 (1.8–11.3)
Middle SES	10.9 (6.5–17.5)	3.9 (2.3–6.5)	13.3 (7.5–22.4)	4.3 (2.7–6.7)
High SES	8.8 (4.5–16.7)	4.3 (2.0–8.8)	8.1 (3.5–17.8)	5.4 (2.9–9.6)
Total SES	11.8 (7.8–17.5)	4.4 (2.8–6.8)	14.9 (9.5–22.7)	4.6 (3.1–6.8)

n.a. not analysed. [a]At least once per month.

er (10%) and is apparent in all age groups. One possible reason for this could be the different modes of assessment. While telephone interviews were conducted in GEDA, self-administered questionnaires were used in DEGS1. In addition, standard drinks were illustrated with figures in the questionnaire. A study analysing different modes of assessment is currently being carried out on behalf of the RKI. We expect that the results of this study will allow us to better interpret these differences in the future. According to the literature it seems that conducting the AUDIT-C face-to-face reduces the willingness to participate [27].

The fact that at-risk drinking and heavy episodic drinking are extremely widespread among young individuals in general and men in particular, is highly relevant. There is a higher risk for alcohol-related illnesses, alcohol dependence and injury-related disability among individuals with these drinking patterns.

In future data analyses which take the data from GNHIES98 and the DEGS1 Mental Health module into account, we will analyse the long-term consequences resulting from hazardous alcohol consumption during younger years.

The finding that at-risk drinking is more common among women with higher socioeconomic status is consistent with results from addiction research specifically on women [28, 29].

With respect to medical advice given to individuals with at-risk or heavy episodic drinking, women and young individuals receive less often advice in the context of primary health care. Future data analyses aim to shed light on the reasons for this. While younger people may simply receive primary health care less frequently, the low frequency of receiving advice among women needs to be examined more closely by means of gender-specific analyses.

Conclusion

At-risk drinking and heavy episodic drinking represent a problem with high public health relevance in Germany. Longitudinal studies and further analyses on associations with health effects are necessary.

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