Received: 30 July 2021 | Accepted: 8 May 2022

DOI: 10.1111/add.15960

RESEARCH REPORT

ADDICTION SSA

Prevalence and self-rated health and depression of family members affected by addictive disorders: results of a nation-wide cross-sectional study

Gallus Bischof[1] | Anja Bischof[1] | Richard Velleman[2,3] | Jim Orford[4] | Ronny Kuhnert[5] | Jennifer Allen[5] | Stefan Borgward[1] | Hans-Jürgen Rumpf[1]

[1]Department of Psychiatry and Psychotherapy, University of Lübeck, Lübeck, Germany

[2]Department of Psychology, University of Bath, Bath, UK

[3]Sangath Community Health, Goa, India

[4]School of Psychology, University of Birmingham, Birmingham, UK

[5]Department of Epidemiology and Health Monitoring, Robert Koch Institute, Berlin, Germany

Correspondence
Gallus Bischof, Department of Psychiatry and Psychotherapy, University of Lübeck, Lübeck, Germany.
Email: gallus.bischof@uksh.de

Funding information
Bundesministerium für Gesundheit, Grant/Award Number: ZMVI1-2518DSM209

Abstract

Aims: To estimate the prevalence of family members affected by addictive disorders (FMA) with regard to various types of addictive disorders, and self-rated health and depression in the general population.

Design: Cross-sectional general population survey.

Setting: The German Health Update study (GEDA) 2014/2015, a nationally representative panel of German residents aged 15 years or older.

Participants: A total of 24 824 residents aged 15 years or older.

Measurements: Participants were asked if they had a family member with current or past addictive disorder, the type of addiction and the relationship status. In addition, self-rated health and depression were assessed using standardized questionnaires.

Findings: Of the respondents, 9.5% [95% confidence interval (CI) = 9.0–10.0] reported being affected by a current addictive disorder of a relative (cFMA), with a further 4.5% (95% CI = 4.2–4.9) reported having been affected by the addictive disorders of a relative in the past but not within the last 12 months (pFMA). Most FMAs reported having been affected by disorders due to alcohol, followed by cannabis and other drugs. Compared with life-time non-FMAs, FMAs reported significantly ($P < 0.001$) higher odds ratios for depression (cFM = 2.437; 95% CI = 2.082–2.853; pFMA = 1.850; 95% CI = 1.519–2.253) and ill-health (cFMA = 1.574; 95% CI = 1.374–1.805; pFMA = 1.297; 95% CI = 1.082–1.555).

Conclusions: In Germany, family members affected by addictive disorder are a substantial group within the general population. This group is characterized by ill-health and has not yet been adequately addressed by the addiction treatment system.

KEYWORDS
alcohol, cannabis, depression, family, gambling, general population, public health

INTRODUCTION

Substance misuse and substance-related disorders affect not only consumers, but also their social environment. It is assumed that, depending upon the specific addictive behaviour, the overall societal costs incurred, such as the damage to third parties, may be considerable [1]. In some instances the damage to third parties may be comparable in size or even greater than the damage to the user. While negative effects of parental—especially maternal—substance abuse on children has been well researched [2, 3], effects on adolescent and adult others have been studied less extensively.

There are two empirical research paradigms within which the effects of addictive disorders or problematic substance use on others have been examined, but both suffer from major restrictions: one looks at representative samples but mainly looks at the range of negative experiences and not at the severity of their effects; the other looks at the specific case of family members affected by addictive disorders (FMAs), but has tended to look at selected and not representative samples.

The first paradigm is the growing field of research into harm to others (HTO). This paradigm tends to examine large and often representative samples, and tends to ask mainly about a wide range of possible immediate consequences such as substance-associated traffic accidents, substance-induced violence or the effects of parental addictive disorders on children [4, 5]. Such population-based measures of HTO have been increasingly used in population-based studies for more than 10 years [6–10], and were endorsed by the World Health Organization (WHO) in 2010 as a priority component of the global strategy to reduce the harmful use of alcohol [11]. For other substances and gambling, initial findings on HTO are also available (e.g. [12–16]), also indicating that the numbers affected by HTO are substantial.

These studies are extremely useful in identifying the range of negative experiences within a population due to substance use, with items such as noise pollution, fear of physical harm or insult, as well as destruction of property by intoxicated people, all being commonly reported [17]. These studies also often show a high incidence of such experiences, e.g. for alcohol alone, between 25 and 53% [18], with most studies consistently showing that people reporting these experiences are more likely to be younger, more often single and are more likely to report risky consumption patterns of alcohol or other intoxicants themselves [9, 19–22].

Within subjects experiencing HTO, effects on self-rated health increased with the number and severity of problems and proximity of the known substance user [23, 24]. However, while most studies assessed only a self-rated degree of impact on personal wellbeing and compared subgroups of individuals reporting HTO, only a few studies compared health-related variables in individuals experiencing HTO to individuals reporting no HTO, and all these studies were restricted to alcohol-related harm. In general, knowing that heavy drinking was related to lower self-rated health [23, 25] and lower quality of life and/or wellbeing [25–29], increasing with the number of known heavy drinkers, the number of types of harm were more pronounced in more closely associated relationships or individuals living in one household with the heavy-drinking person.

While controlling for the participant's own frequency or quantity of alcohol intake did not account for the association of HTO and health in most studies [25, 27, 29, 30], three studies that measured problematic alcohol use (signs of dependence, harmful consumption) by individuals affected by HTO found significant associations between severity of own alcohol use and degree of HTO [10, 31, 32].

The findings noted above suggest two things. The first is that studies of HTO often capture somewhat immediate experiences, often from individuals who are themselves risky users of substances. The second is that items used for assessing HTO in surveys typically measure type of harm, not severity. A recently published analysis based on a survey of leaders of national alcohol surveys suggested that further studies should focus in more detail on the harms with a perceived high severity [33].

The second empirical research paradigm, instead of looking generally at a cross-section of the population, looks more specifically at the effects of addictive disorders or problematic substance use on family members, and examines not only immediate harms but the severity of those, and the more complex social impacts, such as consequences for the social environment over a long period of time that typically are associated with substance use disorders [34]. Such studies (which usually do not use representative samples) have shown that family members are often severely affected by a relative's addictive disorders or problematic substance use [35]. Qualitative studies indicate that other interpersonal factors, such as concerns about relatives, are additional sources of stress [36] which can also contribute to chronic stress and depressive developments, especially when levels of human resources and resilience factors are low [37]. Therefore, analysing the impact of addiction on health of family members might complement research on HTO in order to determine the public health impact of substances upon third parties.

Negative effects of addictive disorders on the health of relatives have been consistently demonstrated. In FMAs, increased rates of victimization, injuries, mood disorders and anxiety disorders, a reduced overall health status, significantly increased health-care utilization, medical treatment costs and productivity losses have all been demonstrated, compared to people with comparable life situations without a relative suffering from addictive disorders [35, 38–40].

Furthermore, insurance data from the United States also show that the general medical treatment costs of FMAs compared to individuals not affected by addictive disorders in the family (nFMAs) are associated with drinking status of the reference population; i.e. evidence suggests that increased morbidity and treatment needs for FMAs are a direct consequence of the addictive disorder present in the family and are reduced once abstinence of the relative has been achieved [41, 42].

These data suggest that the impact on FMAs is severe; but unlike the HTO paradigm, no population-based representative samples have been examined to understand the true prevalence or seriousness of the situation. Because of this, the overall social health effects on relatives cannot yet be assessed satisfactorily, as there are no

representative figures regarding the number of relatives of individuals with addictive disorders and their health impairments, which is the starting-point for the research presented in this paper. Data from a German study using a primary health-care sample indicate substantial rates of FMAs and significantly elevated depression scores in this group [43]; however, the representativeness of these findings remains unclear. To date, no epidemiological data are available that have specifically assessed the proportion of individuals faced with a relative suffering from addiction, nor their level of harm.

Accordingly, within the framework of the representative German Health Update survey (GEDA; in cooperation with the Robert Koch Institute), this study has two aims: (1) estimating the prevalence of people who have family members affected by current or past addictive disorders in Germany; and (2) estimating differences in self-rated health and depression between those with current, past or no family members affected by addictive disorders, accounting for their own substance use and socio-demographic characteristics.

MATERIALS AND METHODS

Study design and participants

Data were obtained from the cross-sectional GEDA study, which is part of the nation-wide health monitoring system administered by the Robert Koch Institute. GEDA is a national health survey based on a resident's registration office sample among individuals aged 15 years and older living in Germany, that aims to provide data on population health, health determinants and the use of health services for national and European health reporting systems, health policies and public health research. In our analysis, data were used from the GEDA 2014/2015 study, conducted from November 2014 to July 2015. Detailed information on the design, contents, survey metrics and results of the GEDA study can be found elsewhere [44]. The achieved sample distribution comparing the crude sample with the reference population has been shown to be satisfactory in relation to sex, age and federal state distribution. In addition, a weighing factor that targets the total study population aged 15 years and older was provided by the Robert Koch Institute. The weighing factor is the product of a design weight and an adjustment weight. The design weight considers the sampling design; the adjustment weight considers the age and sex distribution, as well as the structure of federal states and community and population size structure between urban and rural areas (region) according to the population projection of the Federal Statistical Office [44].

Within the scope of this survey, a representative sample of 24 824 participants in two waves were comprehensively questioned by means of standardized questionnaires on health impairments, health behaviour and utilization of medical services. The response rates were calculated according to the standards of the American Association of Public Opinion Research (AAPOR, 2016). The response rate 1 ('minimum response rate'; number of completed questionnaires divided by all contacted individuals, including those with unknown availability) was 27.6% and the refusal rate was 6.7%. The refusal rate results from the number of individuals who did not respond, refused to participate or who stopped answering the questionnaires. A detailed description of response rates by age group and gender can be found in Lange et al. [44]

The study was approved by the Federal Commissioner for Data Protection and Freedom of Information, and informed consent was obtained from all participants in advance.

Measures

Addictive disorders in the family

Participants were asked: 'Do you have a family member suffering from an addictive disorder (except tobacco)?' ['Haben Sie einen Angehörigen, bei dem eine Suchterkrankung (ausser Tabak) vorliegt?']. Answer formats were yes, problem persisted in the last 12 months; yes, but problem resolved more than 12 months ago; no. If participants had more than one such relative, they answered this question in relation to the more recent, i.e. ticked 'last 12 months' if at least one was current in the past 12 months. If participants signified having a family member with an addictive disorder irrespective of persistence, a next question asked: 'what type of addictive disorder is it' ['Um welche Suchtform handelt es sich']. Answer formats were alcohol, cannabis, other drugs, prescription drugs, pathological gambling and other; multiple entries were possible. A third question asked: 'What is your relation to the affected individual ['In welchem Verhältnis stehen Sie zu dem Betroffenen?']. Answer formats were partner, parent, child, sibling, other; multiple entries were possible where someone had more than one such relative). Addictive disorders were not otherwise specified.

Socio-demographic assessment included sex, marital status and level of education. Level of education was assessed according to the International Standard Classification of Education and grouped into three categories from 'low' (maximum initial vocational education) to 'high' (minimum specialized vocational education [45]).

Alcohol consumption during the past 12 months was measured based on the Alcohol Use Disorders Identification Test–Consumption questions (AUDIT-C) [46]. This information was ascertained according to the number of standard drinks consumed on weekdays (Monday–Thursday) and weekends (Friday–Sunday). The amount of pure alcohol consumed per day was calculated and categorized according to risky consumption (defined as consumption of more than 10 g of pure alcohol daily for women and more than 20 g for men) [47].

Heavy episodic drinking (HED) was assessed by asking: 'In the past 12 months, how often have you had six or more drinks containing alcohol on one occasion? For instance, during a party, a meal, an evening out with friends, alone at home, …'. Participants reporting consuming six drinks or more on at least one occasion per month were classified as HED.

Smoking status was measured with the item: 'Do you smoke?' (answer categories: 'yes, daily', 'yes, occasionally', 'no, not any more',

'I have never smoked'). Participants reporting daily smoking were classified as smokers.

Depression in the last 2 weeks was assessed using the eight-item patient health questionnaire (PHQ-8) [48], that covers eight of the nine diagnostic criteria for major depression according to DSM-IV: depressed mood, anhedonia, significant change in weight or appetite, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness or guilt and diminished ability to think or concentrate. The criterion regarding thoughts of death and suicidality was not assessed. The German translation of the items was retrieved from Löwe et al. [49]. Items were assessed on a four-point Likert scale (0 'not at all'; 1 'on several days'; 2 'more than half of the days'; 3 'nearly every day'). We used a cut-off score of 10 points or more, which has been shown to classify individuals with clinical depression with high diagnostic accuracy [48].

Self-rated health (SRH) was assessed in accordance with WHO recommendations by asking participants: 'How is your health in general' on a five-point Likert scale (0 'very good' to 4 'very poor') [50]. For the present study, response categories were collapsed and dichotomized: the response categories 'fair', 'poor' and 'very poor' were coded as 'poor SRH' with a value of 1; all other categories were coded as 0.

Analysis

All analyses were carried out using SPSS version 28.0, using the SPSS module Complex Samples to be able to take weightings into account (see Study design). First, groups were compared regarding categorical socio-demographic variables and substance use (using χ^2 tests) and age (using general linear models). Then blockwise logistic regressions were conducted to analyse the predictive value of group membership on self-rated-health and depression, controlling for socio-demographic variables and substance use. The variance inflation factor (VIF) method was used to test the possible collinearity between variables before establishing the model. Because adjusted odds ratios (ORs) in common outcomes (< 10%) overestimate the risk ratio, we also calculated the relative risk (RR) using the formula $RR = OR/(1-P_0) + (P_0 \times OR)$ [51]. The analysis presented in this paper was not pre-registered and is considered exploratory.

RESULTS

A total of 24 450 participants provided valid data on the question of whether they had a family member with an addictive disorder; 284 participants did not answer this question. Among these, 23 participants provided valid data regarding the relationship to the individual with addictive disorders and two more specified the type of addictive disorders without indicating the type of relationship, indicating that although at least one addictive disorder was present in the family, the latency of addiction could not be specified by the participants. These 25 cases were conservatively classified as family members affected by an addictive disorder that was not ongoing during the last 12 months. The remaining 259 participants without valid data were omitted from the analysis.

Among the 24 475 respondents included in the analysis, a total of 9.5% (95% CI = 9.0–10.0) of all respondents self-reported as FMAs of a relative with an ongoing addiction (current FMAs, cFMA) and additionally 4.5% (95% CI = 4.2–4.9) of the total sample self-reported as FMAs of a relative with a past addictive disorder (i.e. no longer active in the previous 12 months; past FMAs, pFMA). Overall, 79.3% (95% CI = 77.2–81.2) reported to have one relative with one or more addictive disorder, 14.1% (95% CI = 12.5–15.7) named two relatives and another 4.6% (95% CI = 3.7–5.6) identified three relatives. Fewer than 2% of the sample reported to have four or more relatives with addictive disorders.

For type of addictive disorder(s) (multiple entries possible), most FMAs reported alcohol (80.5%, 95% CI = 78.8–82.2), followed by cannabis (16.5%; 95% CI = 14.8–18.5) and other illicit drugs (12.2%; 95% CI = 10.9–13.7). All other substances and pathological gambling were mentioned by fewer than 10% of FMAs.

Regarding the type of relationship they had with their relative (multiple entries possible), most participants mentioned that their relative was from outside the nuclear family (i.e. 'other'; 37.9%; 95% CI = 36.0–39.9), followed by the FMA being a child (28.7%; 95% CI = 26.9–30.5), sibling (19.4%; 95% CI = 17.9–21.0), partner (13.4%; 95% CI = 12.0–14.9) and parent (10.3%; 95% CI = 9.1–11.6).

Univariate group differences according to FMA status are shown in Table 1. Compared to participants with no family member suffering from addictive disorders (nFMA), FMAs are significantly younger, more often female, were less often married, less often had a high level of education, were more often smokers and reported higher alcohol consumption in terms of binge drinking, as well as at-risk drinking and higher rates of depression. Differences were more pronounced in cFMAs than in pFMAs. No differences between FMAs and nFMAs could be identified regarding low self-rated health. As significant group differences in terms of socio-demographic and substance use characteristics are known to be associated with depression and self-rated health, multivariate analyses were conducted controlling for age, gender, being married, high formal education and substance use.

Table 2 shows the multivariate logistic regression for predicting low self-rated health. The multicollinearity test showed that the value of variance inflation factor VIF between explanatory variables was between 1.03 and 1.17, indicating that there was no multicollinearity between explanatory variables. Most socio-demographic variables were significantly associated with SRH, and there was also a significant association between all risky drinking, binge drinking and smoking and low self-rated health categories. Compared to nFMAs, FMA group membership predicted low SRH. Compared to nFMAs, cFMSs had a relative risk of low self-rated health of 1.339 (95% CI = 1233–1448), with pFMAs relative risk being 1189 (95% CI = 1056–1329).

Table 3 shows the multivariate logistic regression for predicting depression. The multicollinearity test showed that the value of variance expansion factor VIF between explanatory variables was

TABLE 1 Socio-demographic factors, substance use and self-rated health and depression according to recency of addictive disorders

	cFMA (*n* = 2286)	pFMA (*n* = 1116)	nFMA (*n* = 21 163)	*P*
Age (SE)	39.8 (0.39)	44.7 (0.63)	50.0 (0.15)	< 0.001
Female % (SE)	56.9 (1.4)	54.3 (2.0)	50.1 (0.4)	< 0.001
Level of education %				< 0.001
Low (SE)	21.2 (1.1)	21.1 (1.6)	21.5 (0.5)	
Medium (SE)	61.2 (1.3)	58.3 (1.9)	56.2 (0.5)	
High (SE)	17.6 (0.8)	20.5 (1.3)	22.3 (0.5)	
Family status %				< 0.001
Unmarried (SE)	43.0 (1.4)	35.8 (1.9)	29.5 (0.5)	
Married (SE)	46.6 (1.4)	49.2 (1.9)	56.6 (0.5)	
Widowed (SE)	2.1 (0.4)	4.2 (0.7)	6.7 (0.2)	
Separated (SE)	8.2 (0.7)	10.7 (1.2)	7.2 (0.2)	
Smoking (%)	31.1 (1.3)	25.5 (1.9)	16.0 (0.3)	< 0.001
% At-risk drinking (SE)	20.2 (1.1)	16.0 (1.5)	15.8 (0.3)	< 0.001
% Binge drinking (SE)	37.4 (1.4)	33.3 (1.7)	32.5 (0.5)	< 0.001
% SRH low[a] (SE)	31.9 (1.3)	31.3 (1.8)	30.6 (0.4)	0.560
% Depression (SE)	20.9 (1.2)	16.3 (1.3)	8.6 (0.3)	< 0.001

cFMA = family member of a relative with current addictive disorder(s); pFMA = family member of a relative with past addictive disorder(s); nFMA = family member with no relative with addictive disorder(s); SE = standard error.
[a]self-rated health\.

TABLE 2 Ordinal regression for predicting low self-rated health (Ref.: high SRH)

	aOR	Wald	*P*	95% CI
Female	0.992	0.038	0.846	0.919–1.072
Age	1.045	1217.389	< 0.001	1.042–1.048
Education low	1.796	208.419	< 0.001	1.658–1.945
At-risk drinking	0.845	9.709	0.002	0.818–0.971
Not married	1.172	15.008	< 0.001	1.081–1.271
Binge drinking	0.891	7.049	0.008	0.818–0.971
Smoking	1.687	105.297	< 0.001	1.526–1.865
FMA		23.822	< 0.001	
cFMA	1.574			1.374–1.805
pFMA	1.297			1.082–1.555

aOR = adjusted odds ratio; cFMA = family member of a relative with current addictive disorder(s); pFMA = family member of a relative with past addictive disorder(s). Ref.: family member with no relative with addictive disorder(s) (nFMA).

TABLE 3 Logistic regression for predicting depression (PHQ8 sum score > 10; Ref.: no depression)

	aOR	Wald	*P*	95% CI
Female	1.333	25.568	< 0.001	1.184–1.500
Age	1.001	0.233	0.630	0.998–1.004
Education low	1.668	64.487	< 0.001	1.485–1.919
Not married	1.545	53.952	< 0.001	1.375–1.736
At-risk drinking	0.921	1.302	0.255	0.799–1.061
Binge drinking	0.803	12.611	< 0.001	0.711–0.907
Smoking	1.904	100.096	< 0.001	1.678–2.161
FMA		73.919	< 0.001	
cFMA	2.437			2.082–2.853
pFMA	1.850			1.519–2.253

aOR = adjusted odds ratio; cFMA = family member of a relative with current addictive disorder(s); pFMA = family member of a relative with past addictive disorder(s). Ref.: family member with no relative with addictive disorder(s) (nFMA).

between 1.03 and 1.7, indicating that there was no multicollinearity between explanatory variables. Again, most socio-demographic variables were significantly associated with depression, and again there was a significant association between binge drinking and smoking (but not at-risk drinking) and depression. Compared to nFMAs, FMA group membership predicted elevated depression rates. Compared to nFMAs, cFMSs had a relative risk of depression of 2.169 (95% CI = 1.905–2.461), with pFMAs relative risk being 1.724 (95% CI = 1.454–2.034).

DISCUSSION

The data from the GEDA study allow for the first time an estimate of the prevalence of family members affected by addictive disorders in the general population. Of the German general population aged 15 years and older, 9.5% reported having a relative with an ongoing addictive disorder problem within the past 12 months; another 4.5% reported they had a relative with a past dependency. Extrapolated to the total population aged 15 years and older of

71.3 million participants [52], this corresponds to approximately 6.8 million participants (95% CI = 6.94–7.13) affected by a current dependency and a further 3.2 million participants (95% CI = 2.9–3.5) affected by a past dependency.

As expected from previous survey data on harm from others substance use [20] and prevalence rates of alcohol and drug use in Germany [53], being affected by family members' alcohol use disorders was most prevalent, followed by family members use of cannabis and other illicit drugs. It can be assumed that the significantly lower mentioning of dependence on prescription drugs (PD) indicates that PD dependence is more likely to remain undetected by relatives, at least for longer periods, especially if the medication has been prescribed for a long time by a doctor because of existing medical conditions.

In accordance with previous findings [35, 37, 54], FMAs reported higher levels of depression and reduced self-rated health, with cFMAs reporting the highest burden, followed by pFMAs. Findings suggest a strong association between the recency of the addictive disorders and ill-health and depression and correspond to the results of analyses from the United States based on health insurance data, which suggest that the psychosocial burden on partners of males with an alcohol use disorder decreases after successful treatment [42]. There were also significant associations between binge- and risky drinking and smoking, with both depression and self-reported health; FMAs reported higher levels of all of binge- and risky drinking and smoking. Overall, findings are in line with studies on HTO that focused upon more severe experiences due to others' substance use [23, 30] and confirm the high public health relevance of the topic, especially with regard to depression [26, 30, 55]. Although an overlap between groups is to be expected, further research is needed to determine to what extent addiction in the family represents a measure of HTO that goes beyond immediate experiences due to others' drinking. It can be assumed that both approaches might complement each other. Restricting our approach to relatives with a recognized 'addictive disorder' as opposed to asking about the effects of alcohol or drug use, as is usually conducted in HTO studies, yielded lower prevalence rates. At the same time this analysis, by looking solely at depression and self-reported health, only covers a fraction of HTO due to problematic substance use and problematic gambling.

However, our results have important public health ramifications, especially regarding mental health. Controlling for confounders, the risk of clinical depression was more than doubled in cFMAs and elevated by 72% in pFMAs. Furthermore, the risk of low self-rated health was elevated by 34% in cFMAs and 19% in pFMAs. While the effect sizes on self-rated health are small, they still can have a considerable impact at the population level. Interestingly, even once the relative's addiction has ceased, FMAs still revealed lower levels of SRH and higher levels of depression, indicating that FMAs require support and further help for a considerable time after their relative has ceased their problematic use of alcohol, drugs or gambling. Because this study used a large sample, even small differences between groups can reach statistical significance. However, the prevalence rates and differences reported are quite large, and imply findings that are of major practical importance as opposed to signifying simply statistical significance.

Although our study, to our knowledge, is the first to give an estimation of the burden of disease associated with addictive disorders based on general population data, several limitations must be considered. Due to the cross-sectional data, no causal conclusions can be drawn. Although we controlled for several possible confounders, longitudinal data would be needed in order to prove the causal chain of the association between addictive disorders and strain in FMAs. Although there are associations between binge- and risky drinking and smoking with both our outcome variables, again no causal conclusions can be made. Furthermore, the definition of 'addictive disorders' in our assessment of FMA status relied upon subjective estimations of the participants and has not been clinically validated. Accordingly, they reflect the perception and knowledge of the participants, which is likely to be based upon what they were able to observe about the behaviour of their relative(s) and the attributions they were then able to make about the relationship between these observed behaviours and the relative's use of substances or gambling. However, this limitation also refers to other operationalizations of population-based estimates of the number of individuals associated with individuals with harmful alcohol use patterns (e.g. [56]). Furthermore, the response rate was modest, although the sample has been shown to match with the general population. Although the survey did not specifically label the topic of addiction and families it is possible that FMAs are less likely to participate in health-related surveys, which might lead to an underestimation of the true prevalence in the population. In addition, the GEDA data do not allow us to draw any conclusions regarding the working mechanism of addiction symptoms on psychological strain in FMAs. A more detailed assessment of characteristics of AFMs (e.g. coping mechanisms) and specific stressors due to the relative's addiction disorder was unfortunately not possible within the framework of the GEDA study. Recent studies focusing upon HTO have included a detailed and standardized assessment on experiences associated with substance use such as, for example, the alcohol HTO questionnaire [9] that might be expanded for addiction-related consequences in future studies. In addition, standardized questionnaires for assessing stressors and coping behaviours of FMAs are available and should be included in future studies [56]. Based upon findings from qualitative research, questions focusing upon the experience of FMAs should include more psychological stressors, such as worries for the wellbeing of the family member suffering from addictive disorders [36].

Accepting these limitations, our findings complement those from population-based studies on HTO. In addition, these findings reflect some of the elements of the Stress–Strain–Coping–Support Model [37] which was developed based both on qualitative and quantitative research with selected samples of FMAs. The findings of this survey suggest that the model should be examined using data from unselected FMAs, recruited from the general population.

ACKNOWLEDGEMENTS

The study was funded by the Bundesministerium für Gesundheit [German Ministry of Health] (ZMVI1-2518DSM209). The funder had no influence on the design, analysis and interpretation of this work. Open Access funding enabled and organized by Projekt DEAL.

DECLARATION OF INTERESTS

None.

AUTHOR CONTRIBUTIONS

Gallus Bischof: Formal analysis; funding acquisition; investigation; methodology; project administration. **Anja Bischof:** Conceptualization; formal analysis; methodology. **Richard Velleman:** Conceptualization. **Jim Orford:** Conceptualization. **Ronny Kuhnert:** Conceptualization; data curation; formal analysis; methodology; project administration. **Jennifer Allen:** Conceptualization; methodology; project administration. **Stefan Borgwardt:** Conceptualization; methodology. **Hans-Jüergen Rumpf:** Conceptualization; funding acquisition; resources.

ORCID

Gallus Bischof https://orcid.org/0000-0003-0432-5497
Anja Bischof https://orcid.org/0000-0003-3176-3329
Richard Velleman https://orcid.org/0000-0003-0012-9704
Jim Orford https://orcid.org/0000-0001-8316-4841
Ronny Kuhnert https://orcid.org/0000-0001-6617-8475
Stefan Borgward https://orcid.org/0000-0002-5792-3987
Hans-Jürgen Rumpf https://orcid.org/0000-0001-6848-920X

REFERENCES

1. Nutt DJ, King LA, Phillips LD. Drug harms in the UK: a multicriteria decision analysis. Lancet. 2010;376:1558–65.
2. Romanowicz M, Vande Voort JL, Shekunov J, Oesterle TS, Thusius NJ, Rummans TA, et al. The effects of parental opioid use on the parent–child relationship and children's developmental and behavioral outcomes: a systematic review of published reports. Child Adolesc Psychiatry Ment Health. 2019;13:5.
3. Oei JL. Alcohol use in pregnancy and its impact on the mother and child. Addiction. 2020;115:2148–63.
4. Bellis MA, Quigg Z, Hughes K, Ashton K, Ferris J, Winstock A. Harms from other people's drinking: an international survey of their occurrence, impacts on feeling safe and legislation relating to their control. BMJ Open. 2015;5:e010112.
5. Rossow I. How well do survey studies capture alcohol's harm to others? Subst Abuse Res Treat. 2015;9:99–106.
6. Casswell S, Harding JF, You RQ, Huckle T. Alcohol's harm to others: self-reports from a representative sample of new Zealanders. NZ Med J 2011;124:75–84.
7. Laslett AM, Rankin G, Waleewong O, Callinan S, Hoang HT, Florenzano R, et al. Multi-country study of harms to children because of others' drinking. J Stud Alcohol Drugs. 2017;78:195–202.
8. Laslett AM, Room R, Ferris J, Wilkinson C, Livingston M, Mugavin J. Surveying the range and magnitude of alcohol's harm to others in Australia. Addiction. 2011;106:1603–11.
9. Beynon C, Bayliss D, Mason J, Sweeney K, Perkins C, Henn C. Alcohol-related harm to others in England: a cross-sectional analysis of national survey data. BMJ Open. 2019;9:e021046.
10. Nayak MB, Patterson D, Wilsnack SC, Karriker-Jaffe KJ, Greenfield TK. Alcohol's secondhand harms in the United States: new data on prevalence and risk factors. J Stud Alcohol Drugs. 2019;80:273–81.
11. World Health Organization (WHO). Global Status Report on Alcohol and Health 2011. Geneva, Switzerland: WHO; 2011.
12. Lund IO, Sundin E, Konijnenberg C, Rognmo K, Martinez P, Fielder A. Harm to others from substance use and abuse. Subst Abuse Res Treat. 2015;9:119–24.
13. Svensson J, Romild U, Shepherdson E. The concerned significant others of people with gambling problems in a national representative sample in Sweden—a 1 year follow-up study. BMC Public Health. 2013;13:1087.
14. Taylor M, Mackay K, Murphy J, McIntosh A, McIntosh C, Anderson S, et al. Quantifying the RR of harm to self and others from substance misuse: results from a survey of clinical experts across Scotland. BMJ Open. 2012;2:e000774.
15. Tulloch C, Browne M, Hing N, Rockloff M. The relationship between family gambling problems, other family stressors, and health indicators in a large population-representative sample of Australian adults. J Gambl Stud. 2021;37:1139–62.
16. Melberg HO, Hakkarainen P, Houborg E, Jaaskelainen M, Skretting A, Ramstedt M, et al. Measuring the harm of illicit drug use on friends and family. Nordic Stud Alcohol Drugs. 2011;28:105–21.
17. Stanesby O, Callinan S, Graham K, Wilson IM, Greenfield TK, Wilsnack SC, et al. Harm from known others' drinking by relationship proximity to the harmful drinker and gender: a meta-analysis across 10 countries. Alcohol Clin Exp Res. 2018;42:1693–703.
18. Moan IS, Storvoll EE, Sundin E, Lund IO, Bloomfield K, Hope A, et al. Experienced harm from other people's drinking: a comparison of northern European countries. Subst Abuse Res Treat. 2015;9:45–57.
19. Seid AK, Grittner U, Greenfield TK, Bloomfield K. To cause harm and to be harmed by others: new perspectives on alcohol's harms to others. Subst Abuse Res Treat 2015;9:13–22.
20. Moan IS, Bye EK, Storvoll EE, Lund IO. Self-reported harm from others' alcohol, cigarette and illegal drug use in Norway. Nord Alkohol Narkotikatidskr 2019;36:413–429.
21. Sundin E, Galanti MR, Landberg J, Ramstedt M. Severe harm from others' drinking: a population-based study on sex differences and the role of one's own drinking habits. Drug Alcohol Rev. 2021;40:263–71.
22. Room R, Callinan S, Greenfield TK, Rekve D, Waleewong O, Stanesby O et al. The social location of harm from others' drinking in 10 societies. Addiction 2019;114:425–433.
23. Bloomfield K, Jensen HAR, Ekholm O. Alcohol's harms to others: the self-rated health of those with a heavy drinker in their lives. Eur J Public Health. 2019;29:1130–5.
24. Ferris JA, Laslett AM, Livingston M, Room R, Wilkinson C. The impacts of others' drinking on mental health. Med J Aust. 2011;195:S22–S26.
25. Eum MJ, Choi MJ. Association between exposure to alcohol's harm to others and health-related quality of life in Korean adults: a nationwide population-based study. Int J Environ Res Public Health. 2021;18(5):2714.
26. Casswell S, You RQ, Huckle T. Alcohol's harm to others: reduced wellbeing and health status for those with heavy drinkers in their lives. Addiction. 2011;106:1087–94.
27. Dussaillant F, Fernandez M. Alcohol's harm to others' well-being and health: a comparison between Chile and Australia. Alcohol Alcohol. 2015;50:346–51.
28. Lewis-Laietmark C, Wettlaufer A, Shield KD, Giesbrecht N, April N, Asbridge M, et al. The effects of alcohol-related harms to others on self-perceived mental well-being in a Canadian sample. Int J Public Health. 2017;62:669–78.

29. Livingston M, Wilkinson C, Laslett AM. Impact of heavy drinkers on others' health and well-being. J Stud Alcohol Drugs 2010;71:778–785.
30. Greenfield TK, Karriker-Jaffe KJ, Kerr WC, Ye Y, Kaplan LM. Those harmed by others' drinking in the US population are more depressed and distressed. Drug Alcohol Rev. 2016;35:22–9.
31. Karriker-Jaffe KJ, Greenfield TK, Kaplan LM. Distress and alcohol-related harms from intimates, friends, and strangers. J Subst Abuse. 2017;22:434–41.
32. Thompson K, Davis-MacNevin P, Teehan M, Stewart S, Caring Campus Research Team. The association between secondhand harms from alcohol and mental health outcomes among postsecondary students. J Stud Alcohol Drugs. 2017;78:70–8.
33. Stanesby O, Gmel G, Graham K, Greenfield TK, Waleewong O, Wilsnack SC. Improving measurement of harms from others' drinking: A key informant study on type and severity of harm. Nord Alkohol Narkotikatidskr 2020;37:122–140.
34. Orford J. Power, Powerlessness and Addiction New York, NY: Cambridge University Press; 2013.
35. Orford J, Velleman R, Natera G, Templeton L, Copello A. Addiction in the family is a major but neglected contributor to the global burden of adult ill-health. Soc Sci Med. 2013;78:70–7.
36. Orford J, Natera G, Copello A, Atkinson C, Mora J, Velleman R, et al. Coping With Alcohol and Drug Problems: The Experience of Family Members in Three Contrasting Cultures London, UK: Routledge; 2005.
37. Orford J, Velleman R, Copello A, Templeton L, Ibanga A. The experiences of affected family members: a summary of two decades of qualitative research. Drugs Educ Prev Policy. 2010;44–62.
38. Dawson D, Grant BF, Chou SP, Stinson FS. The impact of partner alcohol problems on women's physical and mental health. J Stud Alcohol Drugs. 2007;68:66–75.
39. Salize HJ, Jacke C, Kief S. Produktivitätsverluste, berufliche Einbußen und Unterstützungsleistungen von Angehörigen von Patienten mit Alkoholabhängigkeit vor und nach der Entzugsbehandlung [Loss of productivity, job losses, and family support of patients with alcohol dependence before and after withdrawal treatment]. Sucht. 2014;60:215–24.
40. Svenson LW, Forster DI, Woodhead SE, Platt GH. Individuals with a chemical-dependent family member—does their health-care use increase? Can Fam Physician. 1995;41:1488–93.
41. Ray GT, Mertens JR, Weisner C. Family members of people with alcohol or drug dependence: health problems and medical cost compared to family members of people with diabetes and asthma. Addiction. 2009;104:203–14.
42. Weisner C, Parthasarathy S, Moore C, Mertens JR. Individuals receiving addiction treatment: are medical costs of their family members reduced? Addiction. 2010;105:1226–34.
43. Bischof G, Meyer C, Batra A, Berndt J, Besser B, Bischof A, et al. Family members of individuals suffering from addiction: prevalence, health behavior and depressive mood. Sucht. 2018;64:63–72.
44. Lange C, Finger JD, Allen J, Born S, Hoebel J, Kuhnert R, et al. Implementation of the European health interview survey (EHIS) into the German health update (GEDA). Arch Public Health. 2017;75:40.
45. Schneider SL. The International Standard Classification of Education 2011. Comp Soc Res. 2013;30:365–739.
46. Bush K, Kivlahan DR, McDonell MB, Fihn SD, Bradley KA. The AUDIT alcohol consumption questions (AUDIT-C). An effective brief screening test for problem drinking. Arch Intern Med. 1998;158:1789–95.
47. Lange C, Manz K, Kuntz B. Alcohol consumption among adults in Germany: risky drinking levels J Health Monit. 2017;2:64–70.
48. Kroenke K, Strine TW, Spritzer RL, Williams JB, Berry JT, Mokdad AH. The PHQ-8 as a measure of current depression in the general population. J Affect Disord. 2009;114:163–73.
49. Löwe B, Spitzer RL, Zipfel S, Herzog W. PHQ-D. Gesundheitsfragebogen für Patienten. Manual und Testunterlagen [Health Questionnaire For Patients - Patient Health Questionnaire—German version (PHQ)] Karlsruhe, Germany: Pfizer; 2002.
50. De Bruin A, Picavet H, Nossikov A. Health Interview Surveys. Towards Harmonization of Methods and Instruments Copenhagen: WHO Regional Publications; 1996.
51. Zhang J, Yu KF. What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. JAMA. 1998;280:1690–1.
52. Statistisches Bundesamt [Federal Statistical Office]. Bevölkerung nach Altersgruppen: Ergebnisse des Zensus 2011 [Population according to age groups based on the 2011 Census] 2018. Available at: https://www.statistikportal.de/de/bevoelkerung/ergebnisse-des-zensus-2011/bevoelkerung-nach-altersgruppen. (accessed 6 January 2022)
53. Seitz NN, Lochbühler K, Atzendorf J, Rauschert C, Pfeiffer-Gerschel T, Kraus L. Trends in substance use and related disorders: Analysis of the epidemiological survey of substance abuse 1995 to 2018. Dtsch Arztebl Int. 2019;116:585–91.
54. Bischof G, Meyer C, Batra A, Berndt J, Besser B, Bischof A et al. Angehörige Suchtkranker: Prävalenz, Gesundheitsverhalten und Depressivität [Family members of individuals suffering from addiction: prevalence, health behavior and depressive mood]. Sucht 2018;64:63–72.
55. Karriker-Jaffe KJ, Li L, Greenfield TK. Estimating mental health impacts of alcohol's harms from other drinkers: using propensity scoring methods with national cross-sectional data from the United States. Addiction. 2018;113:1826–39.
56. Orford J, Templeton L, Velleman R, Copello A. Family members of relatives with alcohol, drug and gambling problems: a set of standardized questionnaires for assessing stress, coping and strain. Addiction. 2005;100:1611–24.

How to cite this article: Bischof G, Bischof A, Velleman R, Orford J, Kuhnert R, Allen J, et al. Prevalence and self-rated health and depression of family members affected by addictive disorders: results of a nation-wide cross-sectional study. Addiction. 2022;117(12):3140–7. https://doi.org/10.1111/add.15960