

PUBLIC AWARENESS OF ALCOHOL-ATTRIBUTABLE CANCER IN POLAND

STAN WIEDZY POLAKÓW NA TEMAT NOWOTWORÓW ZWIĄZANYCH Z ALKOHOLEM

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Abstract

Introduction: This study investigates the prevalence of alcohol cancer awareness and examines the impact of drinking and sociodemographic variables on alcohol-attributable cancer awareness among the adult population in Poland.

Material and methods: The representative sample consists of 2000 adults (aged 18-64) who were asked to identify whether four types of cancer (breast, larynx, oesophagus, colon known as alcohol-attributable) can be, in their opinion, caused by alcohol drinking. Multiple logistic regression models were developed to identify the impact of respondents' sociodemographic variables and alcohol use on the awareness of alcohol-attributable cancer.

Results: Overall, 67% of respondents indicated at least one from four alcohol-attributable cancer types in prompted responses. The highest percentage of respondents indicated the colon can-

Streszczenie

Wprowadzenie: Celem niniejszego badania było poznanie stanu wiedzy dorosłej populacji Polski na temat nowotworów związanych z alkoholem oraz ocena wpływu spożywania alkoholu i zmiennych społeczno-demograficznych na stan tej wiedzy.

Materiał i metody: Reprezentatywną badaną próbę stanowiło 2000 dorosłych osób w wieku 18–64 lat. Pytano je, czy picie alkoholu może przyczynić się do powstania nowotworów piersi, krtani, przełyku i jelita grubego. W celu określenia wpływu zmiennych społeczno-demograficznych badanych osób i wielkości konsumpcji alkoholu na wiedzę o alkoholowej genezie wymienionych nowotworów wykorzystano modele wieloczynnikowej regresji logistycznej.

Wyniki: Ogółem 67% respondentów wskazało co najmniej jeden z czterech nowotworów, których powstanie można przypisać spożyciu alkoholu. Najwięcej ankietowanych wymieniło raka jelita grubego (57%), podczas gdy niewielu z nich – raka

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cer (57%). However, only minority found breast cancer to be alcohol attributable (15%). Drinker category, gender, age and incomes were a significant predictors of alcohol origin cancer awareness, however their impact differed between cancer types.

Discussion: This study confirmed there are considerable differences in cancer awareness regarding different types of alcohol-attributable cancer. The findings suggest that more than half of the Polish adult population is aware that alcohol may affect the aerodigestive tract, while the awareness of alcohol impact on breast cancer is much lower.

Conclusions: There is a vital need to implement public awareness campaigns on cancer and alcohol with particular attention to breast cancer.

Keywords: Alcohol, Cancer, Public health, Public opinion.

piersi (15%). Kategoria pijącego (wg wielkości spożycia), płeć, wiek i dochody były istotnymi predyktorami postrzegania ryzyka alkoholowego pochodzenia nowotworów, jednak ich wpływ różnił się w zależności od rodzaju nowotworu.

Omówienie: Badanie potwierdziło znaczne różnice w postrzeganiu związku między nowotworami a alkoholem, zależne od typu nowotworu. Wyniki sugerują, że więcej niż połowa dorosłych mieszkańców Polski zdaje sobie sprawę, iż alkohol może wpływać na powstawanie nowotworów układu oddechowego i pokarmowego, podczas gdy świadomość wpływu alkoholu na ryzyko rozwoju nowotworu piersi jest znacznie mniejsza.

Wnioski: Istnieje pilna potrzeba wdrożenia kampanii społecznych, których celem byłoby informowanie na temat ryzyka rozwoju nowotworów związanych z alkoholem, ze szczególnym uwzględnieniem nowotworu piersi.

Słowa kluczowe: alkohol, nowotwory, zdrowie publiczne, opinia publiczna.

■ INTRODUCTION

More than 30 years ago alcohol was classified as a carcinogen by the International Agency for Research on Cancer and the World Health Organization [1]. There is strong evidence to support a causal association between alcohol and cancer of the mouth, throat, oesophagus, breast, liver and colon [2]. The risk of alcohol-attributable cancer is currently growing [3, 4] as, in 2016, there were about 80 000 alcohol-attributable cancer deaths in the EU [5]. The recent data shows that in the WHO European Region, the most common cancer due to alcohol consumption is breast cancer in women and colorectum cancer in men [6].

Alcohol causes cancer in multiple ways, including impairing DNA repair, dysregulation of sex hormones and increasing absorption of carcinogens from tobacco [7]. For alcohol-attributable cancer, there is a dose-response relationship meaning the higher the alcohol consumption, the higher the risk of cancer incidence [5]. Several meta-analyses show that alcohol consumption is a significant risk factor for upper and lower digestive tract cancer. In a study by Pelucchi *et al.* [8], heavy alcohol consumption was significantly associated with

a 5-fold increase in the risk of oral and pharyngeal cancer and oesophageal squamous cell carcinoma, a 2.5-fold increase for laryngeal cancer, a 50% increase for colorectal and breast cancer and 30% for pancreatic cancer. Authors stressed that at low doses of alcohol consumption (less than 1 drink per day) the risk for oral and pharyngeal cancer also increased by about 20% and 30% for oesophageal carcinoma. Other meta-analyses confirmed that even light and moderate drinking increases the risk of oral cavity, pharynx, oesophagus and breast cancer as carcinogenesis can be enhanced with relatively low daily doses of ethanol [9-11]. A systematic review of 15 meta-analyses proved the existence of a dose-response relationship between alcohol consumption and the risk of breast cancer even at low levels of consumption. Women who were light alcohol consumers made up 19% of alcohol-attributable breast cancer cases and 17.5% of breast cancer related deaths [11].

The evidence on alcohol-cancer link derives also from cohort and modelling studies. In a cohort study by Schütze *et al.* [12] 10% and 3% of the incidence of total cancer was attributable to alcohol consumption (former and current) among men and women respectively, whereas for selected

cancer the figures were much higher at 44% and 25% for upper aerodigestive tract, 33% and 18% for liver and 17% and 4% for colorectal cancer for men and women respectively. The recent modelling study published in *Lancet Oncology* shows that 4.1% (more than 740 000 cases) of all new cancer cases globally in 2020 were attributable to alcohol use. The authors noted that the highest risk of alcohol-attributable cancer occurs in Eastern Asia (5.7%) and Eastern Europe (5.6%). Although the largest burden of alcohol-attributable cancer was represented by heavy alcohol use (47%), the incidence of cancer among moderate drinkers reached 14% [13]. While the proportion of specific alcohol-attributable cancer may not seem large at a first glance even a small increase can be of great importance considering the high prevalence of this kind of cancer in the population [9].

Although the link between alcohol and cancer has been established on the vast amount of scientific evidence, there is still a gap in research on the public awareness of alcohol-attributable cancer. In a French study, 60% respondents acknowledged the existence of a link between alcohol use and cancer. However, beliefs denying cancer risk from drinking were frequent among men, older respondents and those with low incomes [14]. Studies among Australian drinkers found that cancer was the least recognised detrimental effect of alcohol consumption [15, 16]. The same was confirmed in the studies from US, Canada and EU, leading to the conclusion that the risk from alcohol–cancer link might be not fully understood by the general public [17]. Research also shows that although people can be aware of carcinogenic effects of alcohol use, they have several misconceptions about the risks associated with alcohol drinking, including the most common belief about the beneficial effects of wine consumption [18]. Some of these misconceptions can be attributed to the activities of alcohol producers who downplay or deny the existence of an association between alcohol drinking and cancer [19].

The gap in knowledge on public perception of cancer risk associated with alcohol use is also a problem in Poland where cancer incidence, despite some recent improvements, is still relatively high [20]. Therefore the objective of the present study was to examine sociodemographic and alcohol use variables in relation to alcohol cancer risk awareness in the Polish adult population. We

sought to investigate the perception of the alcohol–cancer link and examine the impact of socio-demographic variables in order to improve cancer prevention and inform public health professionals and decision makers.

■ MATERIAL AND METHODS

Study design and research sample

A questionnaire examining alcohol origin cancer risk perception was administered through face-to-face interviews ($N = 2000$). We gathered a nationally representative sample of households in a two-stage sampling process. In the first stage, proportional stratified sampling was prepared on the basis of the national register of the territorial division of the country. The stratification was made in relation to the size of the population in voivodships and municipality size. During the second stage, random sampling with replacement was used for sampling municipalities, accounting for probabilities proportional to the number of municipality inhabitants. In the sampled households, the last birthday method was used to select the respondent among household residents between 18 and 64 years of age. Among them, 50.1% were women and 25% had a university degree. The majority of the survey respondents (87%) reported alcohol drinking in the past 12 months. The study was conducted between August and September 2019 with an overall response rate of 58%. The sample sociodemographic characteristics are presented in detail in Table I. The Research Ethics Board of Institute of Psychiatry and Neurology approved the study protocol.

Measures

Perceived cancer risk awareness was assessed by the question *Which of the health disorders below do you think can be caused by alcohol use?* Respondents selected from a list of nine items covering the following health problems: stroke, breast cancer, larynx cancer, oesophagus cancer, colon cancer, dependence, poisoning, liver cirrhosis and injuries. The responses to this question included: *yes*, *no*, and *don't know*. For purposes of the current analysis, only the issue of alcohol-attributable cancer is investigated.

Data on age, gender, education and monthly household income were obtained from respondents during interviews. Monthly household income per capita was calculated by summing up

Table I. Research sample drinker category and sociodemographic characteristics

Factor	n	%
Drinker category		
Abstainers	238	13
Moderate drinkers	1159	61
Risky drinkers	349	18
Harmful drinkers	145	8
Gender		
Men	998	50
Women	1002	50
Age		
18-29	447	22
30-39	504	25
40-49	435	22
50-64	614	31
Education		
Primary	294	15
Vocational	482	24
Secondary	720	36
University	504	25
Monthly household income per capita*		
< 1000 PLN	341	17
1000-2000 PLN	737	27
2000-3000 PLN	395	20
> 3000 PLN	339	17

*1 PLN (Polish Zloty) = 0.22 EUR

the monthly net income of all members of household and then divided by the number of household members. Moreover, each respondent was asked to provide information on alcohol consumption. The volume of alcohol consumption was assessed using beverage-specific quantity-frequency (BSQF) and risky single occasion drinking (RSOD) method. This method is based on the aggregation of average consumption of three alcoholic beverage types (spirits, wine, beer) combined with risky drinking occasions during past 12 months (drinking more than 60 grams of ethanol in a single occasion for men and more than 40 grams for women). Reported annual volume of consumed alcohol (BSQF) was corrected for larger quantities consumed on single occasions (RSOD), which allowed us to estimate total alcohol consumption effectively [21]. After calculating the volume of pure alcohol consumed during past 12 months, respondents were divided into four groups according to

number of alcohol units (10 grams of ethanol per unit) consumed per week: abstainers (no alcohol during past 12 months), moderate drinkers (up to 14 units of alcohol per week), risky drinkers (15-35 units of alcohol per week for women and 15-50 units for men) and harmful drinkers (more than 35 units of alcohol per week for women and more than 50 units for men). The data set was weighted based on the Statistics Poland data on voivodships, age and gender totals.

Analysis

We performed four separate multiple logistic regression models to explore the impact of sociodemographic variables and alcohol use on the awareness of four specific alcohol-attributable cancer. Each of the investigated cancer (breast, larynx, oesophagus, colon) was regressed against drinker category, gender, age group, level of education and household income per capita. The awareness of alcohol-induced cancer was the outcome variable recoded to binary numbers (yes = 1; other = 0). For logistic regression analyses, we reported odds ratios (ORs) and their 95% confidence interval (95% CI). All correlation coefficients were below 0.3.

RESULTS

Overall, 67% of respondents indicated at least one of the four alcohol-attributable cancer types. The highest percentage of respondents indicated cancer of the colon (57%), oesophagus (52%) and larynx (44%). However, only a minority found breast cancer to be alcohol attributable (15%). As Table II shows, abstainers, moderate drinkers and risky drinkers more often indicated alcohol-attributable cancer awareness than harmful drinkers. Women more often than men reported awareness with exception of breast cancer. Older respondents were more aware of larynx cancer and less aware of breast cancer while the awareness of oesophagus and colon cancer were similar across age categories.

The education level did not greatly differentiate the awareness with exception of colon cancer. The awareness of breast cancer increased with monthly household per capita income. The awareness of larynx and oesophagus cancer was the same or almost the same among the lowest and highest household incomes. Those with the lowest household incomes were also least aware of colon cancer. The differences in indication of any cancer were

Table II. The awareness of four types of alcohol-attributable cancer in Poland (in thousand)*

Factor	Breast cancer		Larynx cancer		Oesophagus cancer		Colon cancer		Any of the listed cancers	
	N (95% CI)	%	N (95% CI)	%	N (95% CI)	%	N (95% CI)	%	N (95% CI)	%
Drinker category										
Abstainers	509.1 (341.4-676.8)	17	1353.9 (1081-1626.7)	46	1538.1 (1231-1845.1)	52	1517 (1223.4-1810.5)	52	1917.3 (1576.2-2258.4)	65
Moderate drinkers	1940.7 (1631.8-2249.6)	14	6521.3 (5832.9-7209.7)	46	7716.5 (6925.8-8507.2)	54	8583.1 (7744.1-9422.2)	60	9876 (8952.4-10799.5)	69
Hazardous drinkers	645.4 (451.4-839.5)	15	1887.6 (1559-2216.3)	44	2154.3 (1785.6-2523)	50	2583.9 (2191.9-2976)	60	2991.6 (2556.8-3426.3)	69
Harmful drinkers	245.6 (121.8-369.5)	14	481.9 (325.2-638.7)	27	740.3 (541.2-939.4)	41	854.6 (660.5-1048.7)	48	1005.7 (792.2-1219.3)	56
Gender										
Men	2017.6 (1696.5-2338.7)	16	5141.9 (4521-5762.9)	42	6020.7 (5314.6-6726.8)	49	6721.4 (5971.5-7471.3)	54	7957.1 (7127.9-8786.2)	64
Women	1647.6 (1334.8-1960.4)	13	5732.1 (5016.7-6447.5)	46	6843.2 (5964.5-7721.8)	55	7478.9 (6560-8397.8)	60	8686 (7641.5-9730.6)	70
Age										
18-29	875.8 (663.1-1088.5)	16	2355.9 (1993.8-2718)	43	2846.3 (2448.9-3243.7)	51	3222.6 (2806.1-3639.2)	58	3919.5 (3431-4408)	71
30-39	1004.9 (782.1-1227.7)	16	2543.3 (2149.9-2936.7)	41	3116 (2632.6-3599.5)	50	3541.7 (3043.6-4039.7)	57	4124.8 (3555.2-4694.5)	66
40-49	788.9 (586-991.8)	15	2401.6 (2012-2791.2)	45	2854.1 (2414.9-3293.3)	53	3193.7 (2758.7-3628.8)	59	3638.4 (3171.2-4105.6)	68
50-64	995.7 (758.5-1232.9)	13	3573.3 (3112.4-4034.1)	47	4047.4 (3549.2-4545.7)	53	4242.3 (3735-4749.6)	56	4960.3 (4413-5507.7)	65
Education										
Primary	568.8 (415.9-721.8)	16	1611 (1325.4-1896.6)	44	1942.6 (1610.4-2274.9)	53	2059.8 (1706.4-2413.3)	57	2514.7 (2122.5-2906.8)	69
Vocational	867.2 (655.1-1079.3)	15	2696.1 (2261.1-3131.1)	45	3025 (2565.3-3484.7)	51	3173.8 (2708.7-3638.9)	53	3899.3 (3389.3-4409.3)	66
Secondary	1277.2 (1036.2-1518.3)	14	3725.6 (3248.1-4203.1)	42	4560.9 (3986.9-5134.9)	51	5171.4 (4563.4-5779.4)	58	5946.9 (5259.6-6634.1)	67
University	952 (747.8-1156.1)	15	2841.4 (2443.4-3239.3)	46	3335.4 (2912-3758.8)	54	3795.3 (3314-4276.6)	61	4282.3 (3780.2-4784.3)	69
Monthly household income per capita										
< 1000 PLN	552.7 (389.6-715.8)	13	1778 (1465.6-2090.5)	42	2048.4 (1699-2397.7)	49	2118.9 (1749.2-2488.5)	50	2672.7 (2264.9-3080.6)	64
1000-2000 PLN	1125.4 (889.7-1361)	12	4046 (3560.6-4531.5)	44	4943.6 (4341.4-5545.8)	54	5528.3 (4925.7-6131)	61	6327.4 (5638.6-7016.3)	69
2000-3000 PLN	837.2 (640.7-1033.8)	17	2171.3 (1812.2-2530.4)	45	2472.7 (2071.1-2874.3)	51	2895 (2482.6-3307.4)	59	3351.5 (2896.6-3806.3)	69
> 3000 PLN	768.4 (565.2-971.6)	18	1751.9 (1439.6-2064.3)	42	2147.1 (1789-2505.2)	51	2421.3 (2028.5-2814.2)	58	2776 (2367.4-3184.7)	66

*Population estimates (aged 18-64).

Table III. Multiple logistic regression models for alcohol-attributable cancer awareness regressed on drinker category and sociodemographic variables (N = 2000)

Factor	Breast cancer		Larynx cancer		Oesophagus cancer		Colon cancer		Any of the listed cancers	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Drinker category										
Abstainers	1.421	0.762-2.650	2.319***	1.442-3.730	1.600*	1.024-2.500	1.296	0.831-2.023	1.497	0.947-2.365
Moderate drinkers	1.067	0.631-1.805	2.165***	1.451-3.229	1.594*	1.107-2.296	1.618**	1.126-2.325	1.677**	1.156-2.413
Risky drinkers	1.119	0.627-1.998	2.049***	1.322-3.174	1.414	0.942-2.120	1.685*	1.123-2.528	1.766**	1.166-2.676
Harmful drinkers (Ref.)	-	-	-	-	-	-	-	-	-	-
Gender										
Women	0.939	0.711-1.238	1.174	0.965-1.428	1.227*	1.010-1.490	1.260*	1.033-1.536	1.276*	1.035-1.573
Men (Ref.)	-	-	-	-	-	-	-	-	-	-
Age										
18-29	1.546*	1.046-2.283	0.926	0.704-1.219	1.015	0.773-1.332	1.244	0.942-1.644	1.48**	1.099-1.992
30-39	1.412	0.974-2.047	0.851	0.656-1.104	0.982	0.759-1.270	1.055	0.813-1.368	1.099	0.838-1.442
40-49	1.31	0.886-1.937	0.968	0.741-1.265	1.029	0.789-1.343	1.286	0.98-1.688	1.213	0.913-1.614
50-64 (Ref.)	-	-	-	-	-	-	-	-	-	-
Education										
Primary	1.124	0.712-1.773	1.018	0.736-1.406	1.145	0.83-1.581	0.859	0.619-1.191	1.174	0.827-1.667
Vocational	1.107	0.749-1.635	1.087	0.825-1.432	1.027	0.781-1.352	0.837	0.633-1.107	1.05	0.782-1.409
Secondary	1.041	0.729-1.488	0.89	0.691-1.147	0.968	0.754-1.243	0.962	0.745-1.244	0.979	0.748-1.280
University (Ref.)	-	-	-	-	-	-	-	-	-	-
Monthly household income per capita										
< 1000 PLN	0.612*	0.390-0.962	1.047	0.753-1.454	0.892	0.645-1.234	0.719*	0.518-0.999	0.821	0.582-1.158
1000-2000 PLN	0.600**	0.415-0.869	1.127	0.857-1.483	1.111	0.848-1.457	1.083	0.822-1.428	1.086	0.812-1.451
2000-3000 PLN	0.819	0.549-1.223	1.132	0.833-1.539	0.975	0.72-1.320	1.014	0.745-1.379	1.031	0.746-1.426
> 3000 PLN (Ref.)	-	-	-	-	-	-	-	-	-	-
Nagelkerke R ²	0.016		0.020		0.013		0.024		0.020	

*p < 0.05, **p < 0.01, and ***p < 0.001

less pronounced in most of analysed variables comparing to specific cancer categories. Table II also provides population estimates of alcohol-attributable cancer awareness in Poland.

Table III reports the odd ratios for binary logistic regression in which we investigated four types of alcohol-attributable cancer. Data shows that an increase in total alcohol consumption (as it determines the drinker category) was predictive for larynx cancer awareness. However, on the basis of our data, we cannot conclude there is a dose-response relationship. It seems that harmful drinkers are generally less aware of alcohol-attributable cancer risk. Some exceptions to this rule were found between risky and harmful drinkers in case of oesophagus cancer and between abstainers and harmful drinkers in case of colon cancer awareness. From the set of sociodemographic variables, only gender and to some extent age were correlated with increased awareness of some of alcohol cancer while income category was correlated negatively. No statistically significant effects on cancer awareness were found for education level. Women were more likely than men to report oesophagus and colon cancer awareness. Respondents' age in general did not affect the outcome variable with exception of the youngest age group (18-29) more likely to report breast cancer awareness. Respondents from the two lowest household income categories were less likely to report concerns about the link between alcohol use and breast cancer. Similarly, those from the lowest income category were also less likely to acknowledge the link between alcohol use and colon cancer. Regarding the awareness of any cancer, the odds significantly increased among moderate and risky users, women and the youngest respondents. Overall, the analysed models explained only small amount of the variance (Nagelkerke R^2 ranging from 0.016 to 0.024).

■ DISCUSSION

The present study provides an insight into the awareness of alcohol-attributable cancer in Poland. The results may contribute to the literature on alcohol risk perception and improve alcohol prevention and public health measures in the face of the growing burden of alcohol-related harm in Poland [22, 23]. Our findings suggest that the degree of alcohol contribution to cancer is clearly underestimated especially regarding breast cancer.

The results confirm the study findings in other countries that show considerable differences in cancer awareness observed between different types of cancer, including limited awareness of the link between alcohol and breast cancer [24, 25]. Although we found some sociodemographic differences in alcohol-attributable cancer awareness, education and age (with the exception of breast cancer) did not affect the outcome variables in tested regression models.

Harmful drinkers were less likely to be aware of the link between alcohol consumption and larynx, oesophagus and colon cancer. Although abstainers, moderate drinkers and even risky drinkers seem to be more concerned about the presented cancer issues, in the case of colon (and any cancer category) there was no differences between abstainers and harmful drinkers. This is to some extent consistent with the data on alcohol risk perception showing that increased alcohol use is commonly associated with risk denial, with the exception of abstainers having similar risk judgements as harmful drinkers [16, 21].

Women tend to be more aware of alcohol-attributable cancer in case of oesophagus and colon cancer which is consistent with results of the studies on alcohol risk perception and risk perception in general, showing that women are generally more concerned about health risks than men [16, 21, 26-28]. Interestingly, no gender differences were noted for breast cancer, which highlights the need to make the link between breast cancer and alcohol use more salient. The above findings concerning gender differences are in line with studies showing unrealistic perceptions of women's personal breast cancer risk linked to beliefs, cultural norms and socioeconomic factors [29-31]. What is noteworthy is that the awareness of breast cancer decreased with the household income per capita as individuals from the two lowest income categories were about 40% less likely to identify the link between drinking and breast cancer than those with the highest incomes. The question remains why a similar effect was noted for people from the lowest household income category in the case of colon cancer while none was found in case of larynx and oesophagus cancer awareness.

The findings reported above suggest that there is a more common belief in the Polish adult population that alcohol may potentially affect the digestive track compared to other parts of the human body, for example the breasts in women. This belief prevails among those of lower socioeconomic position while the awareness of breast cancer is rarely

reported by older people. Several possible explanations for this result are possible. First, the issue of alcohol-attributable breast cancer, along with other types of cancer, is absent from public debate and alcohol discourse. Therefore the general public lacks the knowledge on this specific risk. Second, our results suggest that health-consciousness can be found rather among individuals of higher socioeconomic position, which may translate into their higher awareness of alcohol-attributable cancer. Third, younger people are more familiar with the gender-related issues that may prompt specific female health problems. Surprisingly, the odds of alcohol-attributable cancer risk awareness were not affected by education, which reflects the relatively even knowledge gap across education levels. This finding however needs further in-depth inquiry on sociocultural determinants of perceived alcohol risks.

Health risks receiving small media coverage are less important to the general public so awareness of alcohol-attributable cancer can be increased through public and media campaigns [32, 33]. Efforts of this kind are particularly needed in the case of breast cancer and should target all drinkers regardless of gender, age and education in Poland. Future research could focus on more in-depth analyses of the alcohol–cancer link. More than four types of alcohol-attributable cancer ought to be investigated both prompted and unprompted responses on cancer risk compared to deliver more conservative estimations of cancer awareness. Finally, to provide further evidence on how people perceive cancer risk, research should employ both quantitative and qualitative approaches to explore complex issue of alcohol risk perception.

Study limitations

First, we used prompted responses in the question on alcohol-attributable cancer types. Prompted awareness in surveys is generally higher than

awareness measured by an open-ended question (unprompted awareness) as during interviews individuals may associate cancer responses with detrimental effects of drinking without fully understanding the link between alcohol consumption and cancer [24, 34]. This most probably resulted in a higher number of positive responses in our study. As we already emphasised above, the prevalence of awareness of the alcohol–cancer link in Poland should be therefore confirmed in future studies testing both prompted and unprompted responses. Moreover, awareness of cancer origin differs between various cancer types [24, 25], which could affect the outcomes in the context of alcohol consumption being most commonly associated with the aerodigestive track cancer. Second, our study may deliver a limited picture of cancer awareness as the survey covered only the working population (aged 18–64). When surveying older individuals, the results would surely differ as knowledge of cancer morbidity and mortality is generally higher in older than younger cohorts. Third, this study also has shortcomings resulting from a moderate response rate (58%) and therefore might include some response bias.

■ CONCLUSIONS

The results of current study emphasise the vital need to include the evidence on alcohol-attributable cancer in alcohol public awareness campaigns, with particular attention to breast cancer and the growing alcohol consumption among women. Apart of public risk messages, communication on alcohol-attributable cancer from medical professionals is essential and can be implemented in out-patient settings and during brief interventions. Moreover, the strong scientific evidence on the dose-response relationship between alcohol and various types of cancer shows the urgent need to strengthen alcohol-control policy measures.

Conflict of interest/Konflikt interesów

None declared./Nie występuje.

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Ethics/Etyka

The work described in this article has been carried out in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki) on medical research involving human subjects, Uniform Requirements for manuscripts submitted to biomedical journals and the ethical principles defined in the Farmington Consensus of 1997.

Treści przedstawione w pracy są zgodne z zasadami Deklaracji Helsińskiej odnoszącymi się do badań z udziałem ludzi, ujednoliconymi wymaganiami dla czasopism biomedycznych oraz z zasadami etycznymi określonymi w Porozumieniu z Farmington w 1997 roku.

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