

# Over-the-counter (OTC) drug advertising: informative or harmful? – Analysis based on Polish research

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**Abstract. – OBJECTIVE:** Drug sales in Poland have been growing for several years, and the rapid increase in the purchase of OTC drugs can be linked to various advertising measures taken by drug manufacturers. The aim of the study was to assess the effect of over-the-counter drug advertising (OTCA) on preferences and attitudes.

**MATERIALS AND METHODS:** An online survey involving 833 residents was conducted in Poland. The mean age of the participants was 27.97 years (SD = 11.15). The research tool was custom-made.

**RESULTS:** The decision to purchase an OTC drug under the influence of OTCA was made only by 12.4% of the respondents, and familiarity with OTCA inspired confidence among 9.3% of the respondents. However, more people do not even know if the advertising is related to their purchases (19.1%) or is related to trust in the particular drugs (20.3%). OTCA often misleads consumers when it comes to the self-assessment of their own health (18.7%), the therapeutic properties of drugs, and their side effects (22.4%). OTCA caused anxiety in 24.3% of the respondents, 25.2% felt that not taking the drug could worsen their health and 31.8% that it could improve the condition of a healthy person.

**CONCLUSIONS:** This advertisement does not comply with Polish regulations because they mislead consumers, make them anxious, and give the impression that they have to take the drug to stay healthy. In Poland, control over OTCA broadcast in the mass media should therefore be increased.

*Key Words:*

Non-prescription drug, Over-the-counter drug, OTC drug, Over-the-counter drug advertising, Medical advertising, Unfair or false or misleading advertising, Poland, Law.

## Introduction

Poland is the sixth largest market for medicines in Europe. In terms of the number of packages per capita, it is in the second rank<sup>1</sup>. Drug sales in Poland have been growing for several years<sup>1</sup>, and the rapid increase in the purchase of OTC drugs can be linked to various advertising measures taken by drug manufacturers<sup>2</sup>. Medicines are one of the most advertised products in Poland<sup>3</sup>. Intensive advertising of OTC products influences purchasing decisions and can lead to excessive use of these products or addiction<sup>1</sup>. Misuse of OTC drugs has become a global public health problem<sup>4</sup>. Therefore, an important aspect is the reliability of the advertising message and legal regulations concerning this subject<sup>5</sup>. Medical policies should be designed to ensure the widest possible compliance with the human right to treatment<sup>6</sup>, in line with international recommendations (Directive 2001/83/EC of the European Parliament and of the Council of 6 November 2001 on the Community Code Relating to Medicinal Products for Human Use<sup>7</sup>), including health promotion and self-care<sup>8</sup>. At the same time, the policies should ensure protection of the health of patients/consumers through access to reliable information on medicines, enabling a person without medical training to use them properly<sup>9</sup>. OTC drugs, just like prescription drugs (Rx), have specific indications for use and side effects, so their use requires adequate information. Directive 2001/83/EC of the European Parliament<sup>7</sup> prohibits the advertising of Rx drugs, called ‘direct-to-consumer’ (DTC) advertising of prescription pharmaceuticals (DTCA), and those

containing psychotropic substances, but allows the advertising of OTC drugs, i.e., over-the-counter drug advertising (OTCA), which cannot be completely prohibited in EU Member States. In contrast, in the United States of America (USA), New Zealand (NZ), and to a narrow extent in Canada, DTCA is also allowed, which is sought by lobbyists and the EU pharmaceutical industries<sup>10-12</sup>.

In Poland, the advertising of a medicinal product (or drug) is regulated by the Act of 6 September 2001 Pharmaceutical Law (PF) Articles 52-64 and 128-129<sup>13</sup>, and the provisions of the Regulation of the Minister of Health of 21 November 2008 on the advertising of medicinal products<sup>14</sup>, which will be further developed. Within the meaning of the Polish law, the advertising of a medicine is an activity consisting in providing information or encouraging the use of a given medicine with the aim of increasing: the number of issued prescriptions, the supply, sale, or consumption of medicinal products [Article 52(1) of PF]. Thus, the statutory definition assumes that the provision of information is not aimed at protecting the health of consumers but at selling the product. Given this fact, the Polish legislator has not given full freedom to advertisers with regard to the advertising of medicines, by introducing numerous restrictions depending on the type of advertising and its form in order to prevent health damage resulting from the unlawful pursuit of this aim. First of all, they concern the concretization of the prohibition on misleading (the prohibition on lies) resulting from the principles of social coexistence established by the law. The legislator has introduced various types of advertising – in our analysis, we take into account advertising addressed to the public, i.e., directly to the consumer, which in Polish law may only concern OTC drugs – thus constituting OTCA. In Poland, OTCA can take one of the following three forms – audiovisual, visual and audio (§3)<sup>14</sup>. A medicine advertisement, as mentioned above, cannot be misleading and should inform about its rational use, and the advertised medicinal product should be presented objectively [Article 53(1) of PF]<sup>13</sup>. A very important restriction on the advertising of medicines is that it “cannot consist of offering or promising any advantage, whether directly or indirectly, in return for purchasing the medicinal product or providing evidence that it has been purchased”. The advertised product cannot be presented by famous people or people with a medical or phar-

maceutical background or by people who suggest having such a background. If the advertisement involves a doctor or a person who gives the impression of having a medical degree, consumer confidence in the presented medicine increases. Another prohibition expressed by the legislator<sup>13</sup> suggests that a healthy person can improve his or her health condition after taking a given medicine, or vice versa – thus suggesting that a healthy person may experience a worsening of his or her health condition if he or she does not take the medicine. It is also prohibited to ensure that one does not have to consult a doctor to take the medicine or that the medicine has no side effects. Indicating that the use of a given medicine will bring better results than other treatment methods or other medicines is also prohibited by the Polish law<sup>13</sup>.

The aim of the conducted research was to assess the effect of OTC drug advertising on the preferences and attitudes of the respondents, which should be understood as thoughts and beliefs, feelings and behaviors that were caused by the advertising. The following specific aims were adopted in the paper:

1. Analysis of the frequency of purchasing OTC drugs.
2. Analysis of attitudes and preferences toward the advertised drugs.
3. Assessment of whether the drug advertisements contain illegal messages.
4. Identification of sociodemographic groups particularly vulnerable to an illegal message in drug advertising.

## Materials and Methods

### *Procedure and Tools*

The study group consisted of 833 individuals. The only criterion for inclusion to the study was the age above 16 years. There were no other inclusion or exclusion criteria, especially related to participants' gender, education, marital and property status. In Poland, adolescents can express valid declarations of intent in the field of health from the age of 16, so we assumed that they could express their opinions. Detailed data on the study group will be further examined in the Results section.

The survey was conducted using the CAWI (Computer Assisted Web Interview) technique. It was available on Facebook during the autumn-winter period of 2018. This study is exempt

from the regulation of human subjects. We conducted a survey on the website of one of the social networks. The survey was fully voluntary and anonymous. It does not include questions that go into the mental or sexual sphere. No personal data was collected.

The research tool was custom-made questionnaire consisting of 12 independent questions. The survey contained 1 open and 11 closed questions, with the answers being used to achieve the aim of the study. The questions were then aggregated from 1 to 12 in order to develop findings (Table I, Table II – questions). In question 1 on the frequency of use of OTC drugs, the respondents could choose one of four answers: ‘at least once per week,’ ‘once or several times per month,’ ‘once or several times per year,’ ‘less than once per year.’ In the next questions (2-10), they had a choice of five answers: ‘definitely yes,’ ‘rather yes,’ ‘neither yes nor no,’ ‘rather no,’ ‘definitely no.’ In question 11, the respondents had the same set of answers except that ‘neither yes nor no’ was replaced by

‘hard to say.’ Question 12 was an open-ended question and concerned the number of advertisements that was acceptable to the respondents. The survey also included sociodemographic questions (gender, age, education level, self-assessment of one’s own financial situation) to examine the relationship between the respondents’ attitudes and preferences and their sociodemographic characteristics.

### Statistical Analysis

The collected data were subjected to a quantitative and statistical analysis using IBM SPSS Statistics v. 25 (IBM Corp. SPSS Statistics for Windows, Armonk, NY, USA). The methods used to compare independent groups were the non-parametric Mann-Whitney U test, Pearson’s chi-square test and Spearman’s rank correlation coefficient, to verify the links between continuous sociodemographic variables and the answers given to the questions in the survey. A value of  $p < 0.05$  was adopted as an indicator of statistical

**Table I.** Quantitative and percentage distribution of responses to the survey questions concerning attitudes toward drugs and OTC drug advertising, N = 833.

Survey question	Responses, N (%)				
	Definitely yes	Rather yes	Neither yes nor no	Rather no	Definitely no
2. Does over-the-counter drug advertising have an effect on your decision to purchase a drug?	14 (1.7)	89 (10.7)	159 (19.1)	290 (34.8)	281 (33.7)
3. Do you have more confidence in advertised drugs than in unadvertised drugs?	12 (1.4)	66 (7.9)	169 (20.3)	294 (35.3)	292 (35.1)
4. Have you ever been misled by a drug advertisement about its therapeutic properties or possible side effects?	78 (9.4)	108 (13.0)	186 (22.3)	370 (44.4)	91 (10.9)
5. Has a drug advertisement ever led you to make an inaccurate self-assessment of your health because of the inaccurate disease symptoms mentioned in the advertisement?	49 (5.9)	107 (12.8)	155 (18.6)	349 (41.9)	173 (20.8)
6. Have you ever purchased drugs under the influence of a drug advertisement, which resulted in cancellation of a medical visit and deterioration of health?	23 (2.8)	53 (6.4)	57 (6.8)	263 (31.6)	437 (52.5)
7. Have you ever been anxious because a drug advertisement was presented in a form that raised concerns?	56 (6.7)	147 (17.6)	76 (9.1)	268 (32.2)	286 (34.3)
8. Have you ever had the impression that failure to use the advertised drug by a healthy person may lead to deterioration of his/her health?	76 (9.1)	134 (16.1)	109 (13.1)	249 (29.9)	265 (31.8)
9. Have you ever had the impression, after watching or listening to an advertisement, that the drug can even improve the health of healthy people?	88 (10.6)	177 (21.2)	120 (14.4)	221 (26.5)	227 (27.3)
10. Do you consider advertising a good source of information about a given drug?	2 (0.2)	33 (4.0)	96 (11.5)	252 (30.3)	450 (54.0)
11. Do you think that there are too many drug advertisements in the media (TV, radio)?	614 (73.7)	142 (17.0)	41 (4.9)*	35 (4.2)	1 (0.1)

\*Answer ‘hard to say’ – question 11. Source: own research.

**Table II.** Analysis of Spearman's correlation between the responses to the survey questions concerning the attitude to drugs and OTC drug advertising and selected sociodemographic characteristics.

Indicators represented by survey questions	Age	Education level	Self assessment of one's own financial situation	Self-assessment of one's own health
1. Frequency of use of over-the-counter drugs.	0.033	0.009	-0.053	-0.254***
2. Decision to purchase the drug due to advertising.	0.029	0.061	-0.032	-0.071*
3. Greater confidence in advertised drugs than in unadvertised ones.	0.105**	0.078*	0.070	-0.105**
4. Misleading information about therapeutic properties or possible side effects of the drug.	-0.034	-0.004	-0.030	-0.071*
5. Erroneous self-assessment of one's own health due to inaccurate disease symptoms mentioned in the advertisement.	0.033	0.005	-0.055	-0.077*
6. Cancellation of a medical visit and deterioration of health as a result of purchasing the advertised drug.	-0.079*	-0.082*	-0.079*	-0.144***
7. Anxiety as a result of exposure to advertisements in a form that raises concerns.	0.006	-0.046	-0.032	-0.105**
8. Believing that failure to use the advertised drug by a healthy person may lead to a deterioration of his/her health.	0.001	-0.065	-0.018	-0.009
9. Having the impression that the advertised drug even improves the health of healthy people.	0.107**	-0.052	0.014	0.024
10. Believing that the advertisement is a good source of information about the drug.	0.095**	0.059	-0.093**	-0.080*
11. Believing that too many drug advertisements are broadcast in the media (TV, radio).	-0.034	-0.093*	0.095*	0.074*
12. Preference on the maximum number of advertisements in one advertising block: from 0 to 10.	-0.233***	-0.086*	-0.017	0.082*

\*Answer 'hard to say' – question 11. Source: own research.

significance and a value of  $p < 0.1$  was adopted as an indicator of a not fully significant statistical tendency.

## Results

The survey group comprised 833 people, of whom 90.4% were women and 9.6% were men, aged 16 to 80 years. Young people prevailed, with 67.8% of the group under 30 years old. Table III presents the group characteristics in terms of sociodemographic data, to be compared with selected attitudes and preferences toward OTC drug advertising. The test for gender differences showed the women were characterized by a slightly higher age ( $p < 0.05$ ) and education level ( $p < 0.05$ ). In contrast, the men and women shared a similar distribution of subjective assessment of their health and financial situation (Table III). Most of the respondents purchased OTC drugs at least once or several times per month (42.3%, 352 people) and once or several times per year (35.4%,

295 people). A significant number of respondents declared the very frequent purchase of OTC drugs – at least once per week (17.6%, 147 people). Only 39 people (4.7%) purchased drugs less than once per year.

Table I contains information on the frequency of answers to particular categories of questions 2-11. A total of 68.5% of the respondents declared that advertisements do not have an effect on their decision to purchase OTC drugs (question 2), and 70.4% do not trust advertised drugs more than unadvertised drugs (question 3). However, 22.4% of the respondents admitted that a drug advertisement misled them about the therapeutic properties of a drug or its side effects at least once (question 4). In addition, 18.7% of the participants declared that they made an incorrect self-assessment of their health at least once due to advertising of drugs (question 5). More than half (53.5%) stated that drug advertising definitely did not lead to a dangerous cancellation of a medical visit (question 6), although almost one in ten respondents (9.2%) admitted that such a situation

**Table III.** Sociodemographic characteristics of the studied group, including gender differences.

Sociodemographic variables				Mann-Whitney U/chi-squared		
	Whole group, N = 833	Women, N = 753	Men, N = 80	Z/X <sup>2</sup>	df	p-value
Age	29.12 (10.03)	29.25 (9.90)	27.97 (11.15)	-2.048	-	0.041
Education level				10.568	3	0.014
Basic	2 (0.2)	2 (0.3)	0 (0.0)			
Vocational	18 (2.2)	15 (2.0)	3 (3.8)			
Secondary	372 (44.7)	324 (43.0)	48 (60.0)			
Higher	441 (52.9)	412 (54.7)	29 (36.3)			
Self-assessment of one's own financial situation				2.912	4	0.573
Very good	134 (16.1)	121 (16.1)	13 (16.3)			
Good	534 (64.1)	487 (64.7)	47 (58.8)			
Hard to say	137 (16.4)	122 (16.2)	15 (18.8)			
Bad	23 (2.8)	19 (2.5)	4 (5.0)			
Very bad	5 (0.6)	4 (0.5)	1 (1.3)			
Self-assessment of one's own health				3.624	4	0.459
Very good	187 (22.4)	163 (21.6)	24 (30.0)			
Good	449 (53.9)	408 (54.2)	41 (51.2)			
Sufficient	144 (17.3)	133 (17.7)	11 (13.8)			
Poor	48 (5.8)	44 (5.8)	4 (5.0)			
Very poor	5 (0.6)	5 (0.7)	0 (0.4)			

had occurred and led to a deterioration in their health. Drug advertising caused anxiety in almost a quarter of the respondents (24.3%; question 7). 25.2% had the impression at least once that not taking the drug may worsen their health (question 8), and 31.8% that it may improve the condition even of a healthy person (question 9). At the same time, only 4.2% of the respondents declared that advertising is a good source of information about drugs (question 10), and as many as 90.7% said that too many OTC drug advertisements are broadcast in the media (answers – ‘definitely yes’ and ‘rather yes’; question 11).

Considering the fact that a significant majority of the respondents were women, it is difficult to reliably compare the survey responses between the men and women. Therefore, Table II presents the results of an analysis of the correlation between the main questions and linear sociodemographic variables. Several significant correlations were observed between the selected variables, although these were very weak. The confidence of the respondents in OTC drugs decreased ( $\rho = 0.105$ ;  $p = 0.002$ ) with age, and older people were more likely to admit to cancelling medical visits due to misleading advertising ( $\rho = -0.079$ ;  $p = 0.022$ ). With age we can see a decreasing tendency to attribute properties that can improve the condition of healthy people to the advertised OTC drugs ( $\rho = 0.107$ ;  $p = 0.002$ ), and to treat media

advertising as a good source of information about drugs ( $\rho = 0.095$ ;  $p = 0.006$ ). With increases in age, the number of OTC drug advertisements considered necessary to be broadcast during one advertising block also decreased significantly ( $\rho = -0.233$ ;  $p < 0.001$ ; Table II).

A higher level of education correlated with lower confidence in advertisements ( $\rho = 0.078$ ;  $p = 0.023$ ) and was also associated with more frequent cancellation of medical visits ( $\rho = -0.082$ ;  $p = 0.019$ ). The higher the education level of the respondents, the less likely they were to consider advertising a good source of information ( $\rho = 0.059$ ;  $p = 0.090$ ), but they noticed an excessive number of advertisements broadcast in the media ( $\rho = -0.093$ ;  $p = 0.007$ ) and declared the need to reduce this number during each advertising block ( $\rho = -0.086$ ;  $p = 0.019$ ).

Subjective self-assessment of one's own financial situation was associated with three indicators – the better the respondents assessed their economic status, the more often they cancelled their medical visits due to advertising ( $\rho = -0.079$ ;  $p = 0.023$ ), they trusted the advertised drugs more ( $\rho = -0.093$ ;  $p = 0.007$ ) and they did not perceive the number of broadcast advertisements as excessive ( $\rho = 0.095$ ;  $p = 0.006$ ) (Table II).

The subjective self-assessment of one's own health was associated with 11 indicators. Individuals who assessed their health better were less like-

ly to purchase OTC drugs ( $\rho = -0.254$ ;  $p < 0.001$ ), less likely to be influenced by advertisements ( $\rho = -0.071$ ;  $p = 0.040$ ) and less likely to trust them ( $\rho = -0.105$ ;  $p = 0.002$ ). They were also less likely to be misled about therapeutic properties and side effects of a given drug ( $\rho = -0.071$ ;  $p = 0.041$ ) and their own health condition ( $\rho = -0.077$ ;  $p = 0.026$ ), and less likely to cancel medical visits due to misleading information about the advertised product ( $\rho = -0.144$ ;  $p < 0.001$ ). Better health was also the only sociodemographic variable that correlated with a lower sense of anxiety caused by the advertisements ( $\rho = -0.105$ ;  $p = 0.003$ ). People with better health rated OTC drug advertising lower on the scale of reliability of information sources ( $\rho = -0.080$ ;  $p = 0.021$ ), they also noticed the excess of advertisements broadcast in the media more often ( $\rho = -0.074$ ;  $p = 0.033$ ) and preferred a decrease in their number ( $\rho = 0.082$ ;  $p = 0.026$ ) (Table II).

## Discussion

The conducted research revealed that in the studied group every eighth person (12.4%) makes decisions about buying an OTC drug under the influence of advertising. A similar percentage (9.3%) of respondents declared that they trust advertised drugs more than non-advertised drugs. Almost every fifth respondent (18.7%) incorrectly assessed their health under the influence of drug advertising. Worryingly, every tenth respondent (9.2%) declared that they cancelled a doctor's appointment at least once due to drug advertising, which resulted in deterioration of health.

Representative surveys conducted in Poland by the Public Opinion Research Centre (OBOP) in 2003<sup>15</sup> and the Centre for Public Opinion Research in 2010<sup>1,16</sup> showed that the vast majority of Poles purchase OTC drugs. The question arises as to what extent OTC drug advertising has an effect on purchasing decisions and whether it is an important source of information. Table IV presents an overview of Polish research papers related to the use and acquisition of information on OTC drugs, including advertising and own research.

In a representative survey conducted in 2003, advertising was not significantly related to the purchase of OTC drugs (8% of the respondents)<sup>16</sup>, and another national survey conducted in 2010 unfortunately omitted the matter of advertising<sup>1</sup> (Table IV). Another, narrow-focused comparative study

(640 people) conducted in 2002 and 2007 showed that for about half of the respondents, in both periods, advertising was the main impulse for purchasing a drug<sup>17</sup> (Table IV). Nevertheless, such a significant role of advertising is not reflected in later regional studies<sup>18-22</sup>, which indicated that advertising was undeniably related to the quantity and type of purchased OTC products; however, the main decisive factor in choosing an OTC drug was still a pharmacist's or doctor's advice, as well as the opinion of family or friends, and proven effectiveness of the drug, also based on own experience (Table IV, points 4-8). Research on the perception of television advertising for OTC drugs shows that among people over 65 years it is common to make decisions about purchasing a drug based on TV advertising. This tendency is much lower in the younger age groups<sup>23</sup>. Other studies<sup>24</sup> indicate that as many as 38.7% of primary care patients made a decision to buy a specific drug under the influence of its advertising in the media. Interestingly, only 2% of pharmacy customers declared that advertising influences their purchasing decisions, but at the same time up to 30% are willing to buy the advertised medicine after obtaining additional information from other sources<sup>25</sup> (Table IV point 9). This means that advertising is an important factor in drug purchase in Poland, although not the decisive one.

Studies<sup>26</sup> conducted outside Poland also indicate that advertising is significant in the purchase of a drug, but that it does not play a decisive role. In a study conducted in Northern Ireland in 2009 (1461 people, aged 20-60), it was observed that the purchase of an OTC drug was determined by the proven effectiveness of the product (95.9%), although 79.1% also indicated familiarity with the name/brand and over one in three indicated advertising. However, due to the source of information on brands and names of OTC drugs, which may be unprofessional (and thus may also come from advertisements), advertising may have been more related to the purchase of a drug. In the authors' own research, 12.4% of respondents estimated that advertising had an impact on the decision to purchase drugs – however, it is possible that this group is wider and includes people who unconsciously pay regard to advertising. It should be noted that a significant number of respondents (about one in five) in our study do not know whether they make purchasing decisions under the impact of advertising (19.1%, 159 people), or which drugs to trust more (advertised or not) (20.3%, 169 people).

**Table IV.** Purchasing decision, source of information on the use of OTC drugs – Polish research 2003-2021.

Institution/ Authors, year	Sample	Decision to purchase an OTC drug – examined factors	Source of information on the used OTC drug
1. TNS OBOP, 2003 <sup>15</sup>	1000 people – a representative random sample of adult residents of Poland.	39% – doctor’s advice 31% – advice of family or friends 32% – doctor’s or pharmacist’s advice <b>8% – advertising</b>	-
2. Ulatowska-Szostak, 2008 <sup>17</sup>	2002 – 320, 2007 – 320 residents of Wielkopolskie Voivodeship in the age of 30–60	<b>52.4% – advertising – 2002</b> <b>46.1% – advertising – 2007</b>	Searching for additional information when purchasing the advertised drug: <b>23.5% – 2002</b> <b>35.1% – 2007</b>
3. CBOS, 2010 <sup>1</sup>	1041 people – a representative random sample of adult residents of Poland.	-	46% – doctor and leaflet 2% – only doctor 44% – only leaflet 11% – other
4. Bażydło et al 2010 <sup>18</sup>	150 residents of Poland	45% – proven effectiveness of the drug 17% – pharmacist’s advice 12% – doctor’s advice 12% – other person’s advice 6% – habit <b>3% – advertising</b>	-
5. Głowacka and Czajka 2011 <sup>19</sup>	150 students of the city of Poznań (field: Public Health)	52% – own reflections 37% – doctor’s or pharmacist’s advice <b>11% – advertising</b>	39 people – leaflets <b>125 people – advertising in the media</b>
6. Szpringer et al 2015 <sup>20</sup>	277 residents of Świętokrzyskie Voivodeship	31.4% – friends’ opinion 19.5% – doctor’s or pharmacist’s advice <b>24.91% – advertising</b>	-
7. Sobolewski et al 2015 <sup>21</sup>	146 residents of the city of Białystok	65% of women, 43% of men – pharmacist’s advice 20% of women, 16% of men – doctor’s advice 11% of women, 8% of men – family, friends’ opinion <b>26% of women, 11% of men – advertising</b>	-
8. Cybulski et al 2018 <sup>22</sup>	170 residents of the city of Białystok over the age of 60 years	-	<b>46 people – Internet</b> <b>24 people – Television</b>
9. Kraszkwicz and Waniowski 2020 <sup>25</sup>	325 customers of pharmacies located in Wrocław city	49% – doctor’s or pharmacist’s advice 32% – own previous experiences 13% – advice of family or friends 4% – price of the medicine 2% – advertising	30% searching for additional information when purchasing the advertised drug
Own study	833 residents of Poland	<b>12.4% – advertising</b>	<b>4.2 % – advertising</b>

Source: own research.

In contrast, regional opinion surveys conducted in India (unrepresentative of the entire population as they concerned the opinions of 300 residents of the city of Mumbai – study published in 2013), concerning media advertising of OTC cough and cold medicine, indicated that the vast majority of respondents purchased medicines in line with the impact of advertising available in the media (as much as 71%), and the most common source of information about medicines was television (55%)<sup>27</sup>.

Opinion polls conducted among Americans (461 complete questionnaires) indicated that exposure to drug advertising is one of the most important factors influencing their attitudes and behaviors, and other factors such as age, health, education level and even health awareness have less impact<sup>28</sup>. People who were more exposed to advertising had a more positive attitude toward them (skepticism toward advertising decreased)<sup>28</sup>. This means that advertising is linked to confidence in the advertised product, and consequently it has an impact on the decision to purchase a given drug. However, other studies<sup>29</sup> have found that Americans with negative attitudes towards the OTC drug advertising (skepticism, irritation) avoided seeing these advertising. In addition, researchers in other countries also point to the effect of skepticism about OTC drug advertising on their perception<sup>30</sup>. This pattern was also evident in the advertising of prescription drugs allowed in the US – skepticism towards advertising was reduced when it fulfilled an informative function by disclosing the acceptable risks of a drug<sup>31</sup>.

In the authors' own research, the mere fact of familiarity with a drug advertisement arouses confidence in the drug in a not significant part of the consumer group (9.3%). This confirms the tendency, expressed in studies by other authors<sup>28,32</sup>, that exposure to advertising inspires confidence in medicines. In the authors' own research, this phenomenon was intensified by demographic factors, as it concerned mostly people who were younger and people with lower education levels, which can be explained by a lack of life experience and knowledge, as well a worse financial situation. What is interesting is that people with a lower health status had more confidence in the advertised medicines than in unadvertised ones. Perhaps, this was due to greater care for their health and a desire to obtain the most effective drugs – the most popular ones. This could also have been due to insufficient health education of the respondents regarding their conditions and how they deal with them, and even a lack of effec-

tive diagnostics and professional treatment, which may have resulted in an attempt to find 'support' in drug advertising.

It has also been shown that drug advertising contributes to misleading the consumers in terms of the self-assessment of their own health (admitted by 18.7% of the respondents), especially people with a lower health status. It is possible that this kind of people are more sensitive about their health and thus more susceptible to the advertising message.

An alarming fact is that the drug advertisements led to the cancellation of medical visits which resulted in deterioration of health (confirmed by 9.2% of the respondents). This was particularly true for the elderly, people with a worse financial situation and people with a lower health status. A cancellation of a visit may result from reduced access to healthcare services. For an elderly person, it is often problematic to make an appointment with a doctor (due to hearing loss, limited mobility), not to mention the ability to attend the appointment. Therefore, it is more convenient for elderly people to buy an OTC drug than to see a doctor. Those who are less wealthy are more likely to pay positive regard to advertising and purchase an OTC drug in a pharmacy than to spend money on a private visit to a doctor. As indicated earlier, these people had increased confidence in the advertised drugs.

The research results also indicate that advertisements rarely served their informative function. This is particularly worrying as previous studies conducted by other authors<sup>17,23,24</sup> have shown that they are an important source of information for many consumers. For example, in studies by Ulatowska-Szostak conducted in 2002 and 2007<sup>17</sup>, as many as two out of three who bought the advertised medicine did not use other sources of information than advertising (Table IV).

The authors' own research shows that advertising is misleading as to the therapeutic properties of the medicines and their side effects, which was confirmed by 22.4% of the respondents. This tendency was intensified among people with a lower health status, which may be a result of the previously indicated greater confidence in advertising. Individuals with a lower health status were also more likely to admit that drug advertisements make them feel anxious (24.3% of respondents), which in turn may reflect a greater sensitivity of these people toward their health. Moreover, advertisements broadcast in Poland gives the impression that not taking a given drug may dete-



riorate the health (25.2%) and using it may even improve the condition of a healthy person (31.8%). This leads to the conclusion that the consumer perception of OTC drugs in Poland does not comply with the guidelines imposed by the legislator.

The practice of ‘false advertising’ (misleading) and ‘unfair advertising’ (leading to damage) is unacceptable under international (EU) guidelines<sup>7</sup> and the legislation of many countries, such as Poland<sup>13,14</sup>, Germany<sup>32</sup>, the United Kingdom<sup>33,34</sup> and the USA<sup>35,36</sup>. The substantive law seems to be sufficient to protect consumers. However, countries are struggling to enforce these laws. In the USA, administrative and legal problems related to advertising control were identified for example by the FDA (control body of DTCA). With a constant number of controlling FDA officials, an increase in the requirements for FDA decisions and a simultaneous steady increase in the number of advertisements (in the US, a 20% increase per year is observed), it is evident that the supervision is inefficient (e.g., issuing a decision to suspend the emission of an advertisement after the end of its emission)<sup>10</sup>. Such problems also seem to be the main problem of illegal drug advertising in Poland. Unfortunately, the lack of diligent state control for compliance with the provisions of law is conducive to their violation and may expose consumers to serious risks associated with inappropriate and excessive use of medicines.

Summarizing, the obtained results indicate that there is a group of consumers who declare that they interpret OTCA advertisements in a harmful way. These people have experienced OTCA misleading them as to the medicinal properties or possible side effects of a drug or self-assessment of their health and evoked a sense of fear of disease. According to these people, the OTCA gave the impression that not taking the advertised drug may worsen their health condition and taking it may even improve the health condition of a healthy person. Such an understanding of OTC drug advertisements is contrary to the intention of Polish law, and therefore, whether advertisements for OTC drugs broadcast in Poland should be subject to stricter control should be considered. At the same time, for many people advertising is not a source of knowledge about the drug.

### **Limitations**

People who are particularly vulnerable to the harmful effects of OTC drug advertising are elderly people with a lower health status and worse financial situation.

The main limitation of the research is the method of selecting the sample. Young people predominate in the studied group, which is probably due to their frequent use of social networks. Women also predominate in the study. This may be due to the fact that women generally show a greater interest in health issues than men<sup>37</sup> and were more likely to complete the survey than men. Furthermore, it should be noted that women are more likely to assess their health as poor<sup>38,39</sup> which may lead them to take OTC drugs more often, and in turn may have prompted them to participate in a survey on OTC drug advertising.

### **Conclusions**

1. OTC drug advertising has a low effect, by 1/10 respondents, on the purchase and trust of OTC drugs, but as many as 1/5 respondents cannot say what affects their purchase and trust in drugs.
2. These advertisements do not comply with Polish regulations because they mislead consumers and make them feel anxious. They also give the impression that not taking the advertised drug may worsen their health condition and taking it may even improve the health condition of a healthy person.
3. OTC drug advertising in Poland does not fulfil its informative function, and often misleads the consumers when it comes to the self-assessment of their own health and the therapeutic properties of drugs and their side-effects. It also causes some people to cancel necessary medical visits. Therefore, they pose a health hazard to some consumers.
4. People who are particularly vulnerable to the harmful effects of OTC drug advertising are elderly people with a lower health status and worse financial situation.
5. In Poland, the control over OTC drug advertisements broadcast in the mass media should be increased.

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### **Conflict of Interest**

The Authors declare that they have no conflict of interests.

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### **Ethical Approval**

This article does not contain any studies with human participants by any of the authors.

### Informed Consent

Informed consent was obtained from all individual participants included in the study.

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### Authors' Contribution

Conceptualization, I.R., E.K.-C., M.K., K.F.-G.; methodology, I.R., E.K., M.K., K.F.-G.; formal analysis, M.K.; investigation, I.R.; resources, I.R.; data curation, I.R., M.K.; E.K.-C.; writing—original draft preparation, I.R., M.K., E.K.-C.; writing—review and editing, I.R., M.K., B.K.; visualization, I.R., M.K.; supervision, K.F.-G.; B.K.; project administration, I.R., M.K.; funding acquisition, I.R., B.K.

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