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## Usage of Over-the-Counter and Herbal Products in Common Cold in Poland: Findings from Consumer Survey

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### Abstract

Upper respiratory tract infections are usually self-treated with synthetic and herbal over-the-counter products. The aim of the study was to assess the reasons for the purchase of those medications in Poland. We examined 413 adults, aged 18 and over (70.5 % of them were women) using a questionnaire. The findings demonstrate that oral synthetic products were used by 76 % of respondents, while herbal products by 30 %. Synthetic products were used mainly by educated people under 65 years of age, students, and the employed. Herbal products were used mainly by older people. In conclusion, synthetic products against common cold are perceived as more effective. Such medications are used by people who

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probably would like to recover and return to professional activity as quickly as possible. As they generally use more medications, they are at increased risk of adverse effects resulting from drug interactions, and they should be a target group for health education programs.

### Keywords

Herbal products • Common cold • Consumer survey • Over-the-counter

## 1 Introduction

Common colds, which means viral upper respiratory tract infections, are generally mild diseases caused mainly by rhinoviruses, coronaviruses, influenza viruses, adenoviruses, and less often other viruses (human parainfluenza viruses, human respiratory syncytial virus, enteroviruses and metapneumovirus) (Johnston and Holgate 1996). Respiratory tract infections are particularly common among children. It is estimated that two to five colds might occur in adults, while children were prone to have seven to ten colds per year (Eccles 2005). The diagnosis of a common cold is easy and based on clinical symptoms, so that the majority of patients are usually self-diagnosed (Raal et al. 2013). Most upper respiratory tract infections are self-limiting and pose only a small risk of complications. The recommended management, therefore, typically involves self-care and relief of symptoms. The medications aim at bringing the ameliorating effects usually are anti-inflammatory and antipyretic drugs. Most of them are over-the-counter remedies, which are widely available (Ballengee and Turner 2014; ACPM 2011; Eccles 2006). The term ‘over-the-counter’ (OTC) means that the doctor’s prescription is unneeded and it is possible to buy them anywhere, e.g., in a pharmacy, supermarket, at gas stations, or over the internet. To be registered as an OTC product, a drug must be safe in use for a predefined time (usually 3–5 days) in a mild clinical condition which can be self-diagnosed, e.g. common cold, gastrointestinal disorders, or pain (Woźniak-Holecka et al. 2012). The U.S. Food and Drug Administration and many other health care

institutions have considered these drugs as safe and effective in the treatment of many common conditions (FDA 2014). The role of OTC medications in the healthcare system is rapidly increasing and such medications become even a more important group for therapy of the most common diseases worldwide (Ballengee and Turner 2014; Eccles 2006). It has been estimated that as many as 35 % of adults in the US use OTC products regularly (ACPM 2011). The non-pharmacy sales depend greatly on the existing legislation. The most recent list of substances admitted to trading outside pharmacies has been published in Poland in October 2010, and the list is trimmed compared with the previous ones. The use of OTC medications can bring many advantages, e.g., an easy and immediate access to therapy and less time-consuming visits to doctors. People become more responsible to care for their medical condition. The benefits also include a reduction of costs and a better organization of the entire health care system (ACPM 2011). OTC drugs usually have a higher therapeutic index than the prescribed ones and as a consequence they are less likely to cause side effects. However, it should be noticed that the use of OTC drugs could be potentially dangerous for health when the self-diagnosis is wrong or when drug interactions arise (ACPM 2011; WHO 2002). OTC products may also mask serious symptoms. The wide availability of the OTC medications and their intensive marketing promote an excessive use seen in some groups of people (e.g. adolescents and students – medical students particularly), lead to their misuse and addiction in some cases (Ford 2009). The OTC product

market and usage pattern are dictated by profit-orientated pharmaceutical companies, which leads to a situation in which consumers have unlimited access to a wide variety of pharmaceuticals. For these reasons, the use of OTC products must be subject to strict controls. The FDA supervises the drugs introduced to the market in the U.S. and the Compliance Policy Guide has removed a lot of medications from the market due to their unproven safety and efficacy (Fashner et al. 2012). It also should be emphasized that in some age groups of patients, OTC drugs are not recommended or even not allowed. For instance, FDA (2014) recommends the children under 2 years of age not be given any cold medications, while the American Academy of Pediatrics (AAP 1997) recommends to avoid such drugs up to 6 years of age. The role of doctors is to warn patients against excessive and reckless use of OTC drugs and to promote the awareness of benefits and untoward consequences of their overuse (Fashner et al. 2012).

Cold and flu products have been an important and increasing part of the Polish OTC market due to high flu and cold incidence rates. However, the attitude of Polish consumers toward the OTC market and demographic characteristics of people who use such medications have not yet been systematically studied. The aim of the present study was to assess the reasons which drive patients to use OTC medications against common cold. The essence of the research was to determine whether factors such as: education, sex, and place of residence influence the purchase of OTC drugs. We also attempted to evaluate the need for health education in the safe use of that class of drugs.

## 2 Methods

The study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Bioethical Commission of the Medical University in Wrocław (no KB-531/2013). The participants signed informed consent for the study form. They were recruited from December 2013 to April 2014. The main

**Table 1** Sociodemographic data of patients

	n = 413	n	%
Gender	Women	291	70.5
	Men	80	19.4
Age	25 and below	171	41.4
	26–35	62	15.0
	36–45	94	22.8
	46–65	59	14.3
	Above 65	25	6.1
Place of residence	Town below 20,000	188	45.5
	20,000–100,000	116	28.1
	over 100,000	101	24.5
Education	Primary and vocational	34	8.2
	High school	233	56.4
	University	94	22.8

inclusion criterion was the age of at least 18 years. The study group consisted of 413 adults, the majority were women (291; 70.5 %), people between 18 and 24 years of age (171; 41.4 %), high school students (233; 56.4 %), inhabitants of towns with populations below 20,000 (188; 45.5 %). Detailed sociodemographic data are presented in Table 1.

The study was of a self-reported survey type. The questionnaire consisted of 20 questions whose purpose was to estimate if Polish customers use OTC medications, herbal preparations, and other dietary supplements in the treatment of common cold. Questions referred to the place of purchase, frequency of purchase, the fact of informing or not a physician about using them together with other medications, and finally the source of information concerning the product. We also asked whether the leaflet accompanying the product package was sufficiently understandable and tackled the issue of side effects and possible health hazard.

The variables analyzed were qualitative (nominal) data. The  $\chi^2$  test was used to determine differences between variables. Depending on the size of  $2 \times 2$  tables, the  $\chi^2$  test with Yates' correction, and also Fisher's exact test and correspondence analysis were used to determine the relationship between variables in Stub-and-Banner tables. The level of significance was defined as  $p < 0.05$ . A commercial Statistica

10.0 software by StatSoft (Tulsa, OK) was used for all data analyses.

### 3 Results

Oral synthetic OTC products against common cold were used by 76 % of respondents, while herbal products, mainly teas, were used by 30 % of them in the 12 months preceding the study; with some, rather minor overlap in the use of both products. The oral OTCs were used mainly by persons under 65 years of age ( $\chi^2 = 36.6$ ,  $df = 4$ ,  $p < 0.001$ ) with secondary and higher education compared to those with primary and vocational education ( $\chi^2 = 15.6$ ,  $df = 2$ ,  $p < 0.001$ ). These products were used more frequently by students and employed persons compared to unemployed and pensioners ( $\chi^2 = 28.4$ ,  $df = 3$ ,  $p < 0.001$ ). The main place for purchasing these preparations was a pharmacy ( $\chi^2 = 43.5$ ,  $df = 1$ ,  $p < 0.001$ ). The decision to choose a given preparation was primarily taken on the basis of its composition ( $\chi^2 = 7.4$ ,  $df = 1$ ,  $p < 0.006$ ) and was a result of physician's recommendation ( $\chi^2 = 9.9$ ,  $df = 1$ ,  $p < 0.002$ ).

Herbal teas were mainly used by persons over 35 years of age compared to younger persons ( $\chi^2 = 27.3$ ,  $df = 4$ ,  $p = 0.001$ ). These formulations were mainly acquired from shops specialized in selling herbs ( $\chi^2 = 48.3$ ,  $df = 1$ ,  $p < 0.001$ ). The persons who used them did not use any other synthetic oral preparations ( $\chi^2 = 32.8$ ,  $df = 1$ ,  $p < 0.001$ ) and based their decision to get a given formulation on pharmacist's recommendation ( $\chi^2 = 7.1$ ,  $df = 1$ ,  $p = 0.008$ ) and product's price ( $\chi^2 = 13.3$ ,  $df = 1$ ,  $p = 0.0003$ ).

The information on the packaging or in leaflets accompanying medicinal preparations was more often read by women than men ( $\chi^2 = 17.9$ ,  $df = 1$ ,  $p < 0.001$ ), by persons who were guided during the purchase by preparation's composition ( $\chi^2 = 6.3$ ,  $df = 1$ ,  $p = 0.01$ ), and those who declared that the information was understandable and legible for them ( $\chi^2 = 93.4$ ,  $df = 1$ ,  $p < 0.001$ ). Leaflets were more often read by persons with secondary and

higher education than those with primary and vocational education ( $\chi^2 = 16.4$ ,  $df = 2$ ,  $p < 0.0003$ ), those who declared that they got the information about the preparation from magazines ( $\chi^2 = 10.5$ ,  $df = 1$ ,  $p < 0.001$ ), or those under the 65 years of age ( $\chi^2 = 33.7$ ,  $df = 4$ ,  $p < 0.001$ ).

We found a significant relationship between the place of residence of the respondents and their education ( $\chi^2 = 37.0$ ,  $df = 10$ ,  $p < 0.001$ ). Respondents with university education more often lived in big cities with more than 100,000 residents, persons with secondary education in cities of 50,000–80,000 inhabitants, and those with primary and vocational education lived in small towns (less than 20,000 residents). The relationship between the education of the respondents, using OTCs, and their age was also confirmed. Elderly persons over 65 years of age had mostly basic and vocational education, while younger persons aged 26–35 more often had university education ( $\chi^2 = 143$ ,  $df = 8$ ,  $p < 0.0001$ ). In addition, there was a strong relationship between education and employment. The majority of the employed persons had university education, while the majority of the unemployed had basic or vocational education ( $\chi^2 = 154.2$ ,  $df = 6$ ,  $p < 0.0001$ ).

The only statistically significant demographic variable which affected the use of OTC medications against common cold was professional activity. The employed persons (46.1 % of all respondents) and students used OTCs more frequently ( $\chi^2 = 11.6$ ,  $df = 3$ ,  $p = 0.009$ ), and they were also more likely to take other medicines. Those who declared not taking OTCs also denied using other medicines ( $\chi^2 = 9.02$ ,  $df = 1$ ,  $p = 0.003$ ).

We determined the effect of various factors on the use of OTCs against common cold:

- The price was important for people living in medium sized cities with the population from 50,000 to 500,000 ( $\chi^2 = 12.7$ ,  $df = 5$ ,  $p = 0.026$ ) and for students, and to a lesser extent for the pensioners and the unemployed vs. the employed ( $\chi^2 = 6.6$ ,  $df = 2$ ,  $p = 0.038$ );

- The opinion of a physician was most important for the youngest persons below 25 years of age *vs.* persons from the oldest group of above 65 years of age and those aged 26–35 ( $\chi^2 = 10.6$ ,  $df = 4$ ,  $p = 0.031$ ) and for persons with higher and secondary education *vs.* those with primary and vocational education ( $\chi^2 = 6.6$ ,  $df = 2$ ,  $p = 0.037$ );
- The opinion of friends was most important for persons living in medium-sized cities with a population of 50,000–80,000 ( $\chi^2 = 17.7$ ,  $df = 5$ ,  $p = 0.0034$ );
- The opinion of a pharmacist did not matter to people living in big and large cities with the population over 100,000 ( $\chi^2 = 11.6$ ,  $df = 5$ ,  $p = 0.041$ );
- The efficacy of a preparation was a more important criterion for people with university and secondary education than those with vocational and primary education ( $\chi^2 = 26.9$ ,  $df = 2$ ,  $p < 0.001$ ) and more important for women than men ( $\chi^2 = 8.9$ ,  $df = 1$ ,  $p = 0.003$ ).

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## 4 Discussion

To our knowledge, this study has been the largest survey of consumers concerning the intake of OTC medications in Poland in recent years. Data on the self-medication in upper respiratory tract infections, including common colds, in Poland are limited and usually confined to aggregated commercial market data (EAS 2007).

The present study demonstrates that self-medication practices involving OTC and herbal products were widespread in the surveyed sample of the Polish population; the finding which has not yet been reported in the European surveys and reviews focused on factors that drive customers' behavior (Garcia-Alvarez et al. 2014; Bishop and Lewith 2010). Common cold and flu are predominantly self-diagnosed and self-treated with OTC medicines and herbal products (Mathens and Bellanger 2010; Eccles 2005). In the US, where data on the use of dietary supplements, including herbal supplements, have

been collected more routinely, such supplements are used by about 18–19 % of the population (Wu et al. 2011), but available data range from 12 % in the Slone survey (Kaufman et al. (2002)) to 42 % in another national survey (Timbo et al. 2006). In a recent study conducted in Estonia, 67 % of respondents have had self-treated common cold and flu, using homemade remedies and medicinal plants followed by the combined use of herbal products and OTC medicines (Raal et al. 2013). These differences in the prevalence of OTC medicines across studies have been explained by the selection bias and differences in survey methodologies as well as by possible variations in health beliefs and health behavior of the different populations (Vargas-Murga et al. 2011; Schaffer et al. 2003). Likewise, we attribute higher figures obtained in the present study to the possible population bias. The majority of our subjects were frequent customers of pharmacies, which may not hold true for the general population.

Taking into account the aim of our study, we focused on determining the relationships between variables and correspondence analysis. Age and gender have been significant determinants of the consumption of OTC products and dietary supplements in general. Previous studies have shown a higher consumption among women than men (Menniti-Ippolito et al. 2002; National Center for Health Statistics 2002; Schaffer et al. 2003; Messerer et al. 2001; Nilsson et al. 2001; Nielsen et al. 2005) and also among old than young adults (Foote et al. 2003; Kelly et al. 2005; Bailey et al. 2013). In the present study we found a similar pattern of consumption; women bought more OTC products than men, and people >65 years of age more than younger adults. Likewise, people with higher education and being professionally active as well as students used OTC products more often than others. The influence of older age, as compared with the age of less than 35 years, on OTC consumption pattern was particularly visible concerning the use of herbal teas. This finding is consistent with the results of a survey in Estonia, where the general consumption of

medicinal plants increased with age (Raal et al. 2013). Older people have more time and usually suffer from chronic diseases, while younger people look for fast treatment options and prefer synthetic OTC medicines (Raal et al. 2013).

The present study indicates that consumers who use OTC products against common cold also use other OTC products. This is consistent with the finding from the U.S., where about half of the adult population admit using one or more dietary supplements (Bailey et al. 2013; Picciano et al. 2007). Analgesics and antipyretics are among the most commonly used self-medications in the U.S.; a national survey of 4263 adults conducted in 2002 estimated that more than 60 million people take such drugs at least several times a week (National Consumers League 2003). The OTC market and behavior of consumers in Poland seems quite similar to that in the U.S. In contrast, in the U.K. about 90 % of the consumers use only one supplement.

The results of the present survey should be considered in light of their limitations. The population sample encompassed mostly pharmacy consumers, who do not exactly represent the general Polish population. The retrospective nature of data collection might have introduced a data skew related to the retrieval of events or information from the past 12 months preceding the study.

## 5 Conclusions

The synthetic OTC products against common cold are perceived as more effective than herbal products. The OTCs are commonly used by the employed or students, who are busy and probably want to return to professional activity as quickly as possible. People using these preparations also often use more than one medicines. This group of people, being at increased risk of adverse effects resulting from polypharmacological interactions, should be a target group for the health education programs. From the marketing point of view, the

most important target groups for products against common cold in Poland are women (using synthetic OTC medicines), and less educated and older people (using herbal products).

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