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ORIGINAL RESEARCH ARTICLE

Public Health and Legal Aspects of OTC Drug Advertising: Impact on Health Decisions Based on Survey Results

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Abstract

Background: Advertising of over-the-counter (OTC) medicines constitutes an important component of pharmaceutical marketing and may influence patients' health-related decisions. This issue is particularly relevant in the context of increasing self-medication and the widespread availability of OTC products. The aim of this study was to examine the legal framework governing OTC drug advertising, assess the enforcement practice of the Polish Chief Pharmaceutical Inspectorate (GIF), and investigate public perceptions regarding the impact of advertising on health-related behaviour.
Methods: A mixed-methods approach was used, combining a review of national and European legislation, an analysis of decisions of the Chief Pharmaceutical Inspector suspending OTC medicine advertisements issued between 2010 and 2024, and a survey conducted among 204 adult residents of the Miechów district in Poland. Participation was anonymous and voluntary, and the questionnaire consisted of single-choice closed-ended questions.
Results: The analysis of decisions of the Chief Pharmaceutical Inspector demonstrated that the most frequent grounds for intervention were misleading advertising, non-objective presentation of medicinal products and unlawful appeals to authority figures. Survey findings showed that respondents were widely exposed to OTC advertising, primarily through television. Although most participants reported limited influence of advertising on their purchasing decisions, a substantial proportion – particularly among older adults – acknowledged that they had purchased medicines under its influence. The study also revealed significant misunderstandings of advertising claims relating to medicine safety and pharmacological properties, as well as a widespread perception that the volume of OTC advertising is excessive.
Conclusions: OTC drug advertising may influence consumer behaviour and health-related decisions. The findings highlight the need for enhanced patient health education, stronger oversight of advertising practices – especially in digital environments – and more effective enforcement of pharmaceutical advertising regulations.
Key words: OTC medicines; drug advertising; self-medication; public health; pharmaceutical law

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Introduction

A significant portion of individual expenditures is spent on medications. In Poland, the funding for medicines from individual income is among the highest in OECD countries. This is influenced not only by the relatively low level of reimbursement for medicines by the National Health Fund (NFZ), but also by the considerable demand for over-the-counter (OTC) drugs and dietary supplements. This trend can be attributed to the increasing phenomenon of self-medication, driven by both limited access to healthcare professionals and a busy lifestyle, including reduced doctor visits and the impact of extensive advertising through mass media [1]. As a result, the availability of OTC medicines has made it easier for individuals to self-medicate for common conditions such as pain and upper respiratory infections. Consequently, a growing segment of the Polish population is opting to limit visits to physicians, favouring self-treatment instead, which is reflected in the rising sales of analgesics, cold medications and vitamins. Self-medication is expected to increasingly contribute to the expansion of the OTC market. However, the widespread use of self-treatment brings several risks, underscoring the need for stronger legislative and regulatory measures by state authorities. In addition, self-medication may lead to inappropriate drug use, masking of symptoms and limited communication with healthcare providers, which not only complicates accurate diagnosis at the individual level but also generates wider public health concerns by increasing the likelihood of adverse drug events and straining healthcare resources. These challenges call for clear legal frameworks and new solutions that align with advancements in medical knowledge, education and public awareness [2,3].

Study findings indicate that the use of non-prescription medicines is widespread among both women and men, with advertising emerging as a major driver of OTC consumption and a factor reinforcing self-medication [4].

Under current Polish and EU regulations, advertisements must not be misleading, imply guaranteed treatment outcomes, or feature the image of medical professionals. At the same time, the promotion of OTC products is permitted, which raises numerous ethical and public health concerns. This paper explores the protection of patients' rights in the context of the potential negative impact of OTC drug advertising on health-related decision-making.

The aim of this study is to provide a comprehensive review of the legislation in this area, analyze the decision-making practices of pharmaceutical regulatory authorities and present the results of a survey of members of the general public on how they perceive drug advertising.

Material and methods

This study employed a mixed-methods approach, combining legal analysis, document review and empirical research. A comprehensive desk review of the relevant legislation governing drug advertising was conducted. The review included national legal acts and relevant EU regulations. Sources were identified using legal databases (Internetowy System Aktów Prawnych [ISAP], EUR-Lex) and were analyzed to identify substantive requirements, prohibitions and enforcement mechanisms. The selection of legal sources was guided by their relevance to advertising of medicinal products to the public and healthcare professionals.

Decisions issued by the Chief Pharmaceutical Inspectorate (Główny Inspektorat Farmaceutyczny, GIF) ordering the suspension of OTC drug advertisements were collected from publicly available repositories and the official GIF website. The review covered all such decisions issued between January 2010 and December 2024. Each document was analyzed using qualitative content analysis to identify recurring themes, enforcement patterns and the decision-making criteria applied by the authority.

To assess public perceptions of OTC drug advertising, a survey was conducted among members of the general public (not clinical patients), and its results were incorporated into this study:

- The study sample comprised 204 adult residents of the Miechów district (powiat miechowski): 106 women (51.96%) and 98 men (48.04%).
- Respondents were divided into four mutually exclusive age groups: 18–25, 26–40, 41–60, and >60 years. Among women, the respective group sizes were $n = 8$, $n = 21$, $n = 13$, and $n = 64$; among men, they were $n = 24$, $n = 20$, $n = 30$, and $n = 24$.
- The inclusion criterion was a minimum age of 18 years.
- The exclusion criterion was possession of medical or pharmaceutical education, or professional ties to these sectors.
- Participation in the survey was entirely anonymous and voluntary.
- The questionnaire consisted of closed-ended, single-choice questions.
- The survey was conducted using convenience sampling and administered in paper form between 4 and 29 December 2024.

Questionnaire

Perceptions were assessed with an original, non-validated questionnaire developed by the authors specifically for this study. It comprised 15 closed-ended, single-choice items: two demographic items (sex and age group) and 13 items covering exposure to OTC advertising, advertising channels and formats, attitudes and engagement, influence on purchasing behaviour, sources of information about medicines, perceived safety, comprehension of specific

advertising claims, and views on the adequacy of regulation. The instrument was reviewed internally by the authors for face and content validity; no formal psychometric validation (e.g. reliability testing) was performed. The full questionnaire is provided in Appendix S1.

Statistical analysis

Responses to each item were summarised as counts and as percentages within each sex-and-age subgroup. Differences in the distribution of responses across the four age groups (separately for women and men) and between sexes (pooled across age) were tested using the Monte-Carlo test of homogeneity based on the Pearson chi-squared statistic (100,000 simulations under the null hypothesis of a common response distribution), adopted because the expected cell counts were frequently below five. The strength of association was quantified with Cramér's V. Because the analysis was exploratory and involved multiple comparisons, p-values were additionally adjusted with the Benjamini–Hochberg false-discovery-rate procedure and are reported as q-values. Analyses were performed in R version 4.6.0 (R Foundation for Statistical Computing, Vienna, Austria); a two-sided $p < 0.05$ was considered statistically significant. Full results are given in Table 1.

Table 1. Association between survey responses and respondent characteristics

Table / item	Age – Women *p* (*q*); *V*	Age – Men *p* (*q*); *V*	Sex *p* (*q*); *V*
Table 3. Frequency of exposure	0.074 (0.088); 0.22	**0.015 (0.026); 0.26**	0.046 (0.060); 0.20
Table 4. Format most often encountered	0.256 (0.294); 0.22	**<0.001 (<0.001); 0.36**	**<0.001 (<0.001); 0.33**
Table 5. Most accessible format	0.050 (0.062); 0.26	**<0.001 (<0.001); 0.44**	0.067 (0.082); 0.21
Table 6. Reason for watching/listening	**0.007 (0.012); 0.29**	**0.004 (0.007); 0.31**	**0.003 (0.005); 0.28**
Table 7. What is remembered	0.039 (0.056); 0.26	**<0.001 (<0.001); 0.44**	0.375 (0.418); 0.15
Table 8. Opinion on advertising	**0.004 (0.007); 0.28**	**<0.001 (<0.001); 0.35**	**<0.001 (<0.001); 0.30**
Table 9. Purchase under influence	0.042 (0.058); 0.23	**<0.001 (<0.001); 0.39**	**<0.001 (<0.001); 0.31**
Table 10. Main source of information	**0.020 (0.030); 0.28**	**<0.001 (<0.001); 0.41**	0.627 (0.679); 0.11
Table 11. Reads leaflet/ consults	**<0.001 (0.002); 0.31**	**<0.001 (<0.001); 0.41**	**<0.001 (<0.001); 0.42**

Table 12. Perceived safety	**0.002 (0.005); 0.30**	**<0.001 (<0.001); 0.33**	0.037 (0.056); 0.20
Table 13. "Does not cause dependence"	**0.016 (0.026); 0.28**	**<0.001 (<0.001); 0.38**	**<0.001 (<0.001); 0.34**
Table 14. Adequacy of supervision	**0.001 (0.003); 0.32**	**<0.001 (<0.001); 0.39**	0.934 (0.934); 0.06
Table 15. Quantity of ads	0.820 (0.841); 0.12	0.046 (0.060); 0.25	0.771 (0.813); 0.06

p = simulated p-value from a Monte-Carlo χ^2 test of homogeneity (100,000 replicates); q = Benjamini–Hochberg-adjusted p-value; V = Cramér's V; "Age – Women/Men" – test differences across age groups within each sex; "Sex" tests women vs men pooled across age; bold marks $q < 0.05$

Results

Review of legislation and enforcement practice

In Poland, the advertising of medicinal products is primarily regulated by the Pharmaceutical Law [5], which transposes Directive 2001/83/EC [6] into national law. The detailed requirements concerning the forms and conditions of medicinal product advertising, the information to be included in advertisements and the manner in which advertisements are presented are further specified in the Regulation of the Minister of Health of 21 November 2008 on the advertising of medicinal products [7]. The rules on advertising are set out in Chapter 4 of the law, while provisions on sanctions for violations are included in Chapter 9.

These regulations do not apply to products classified as food supplements. In the case of so-called borderline products, however, the Pharmaceutical Law stipulates that if a product simultaneously meets the criteria of a medicinal product and of another type of product – such as a supplement, cosmetic, or medical device – the pharmaceutical legislation takes precedence.

The law provides detailed rules on what constitutes advertising, the types of advertising permitted, the target audiences and which products are subject to restrictions or prohibitions. Advertising of prescription-only medicines is prohibited, while advertising of OTC medicines is allowed. Such products can be purchased not only in pharmacies but also in health and beauty shops, supermarkets, petrol stations and online. An exception applies to OTC medicines containing psychoactive substances, which may be sold only in community pharmacies and pharmacy outlets.

In the case of the pharmaceutical industry, advertising is broadly defined as any activity aimed at informing about or encouraging the use of a medicinal product in order to increase prescriptions, supply, sales, or consumption. This definition, directly reflecting the Directive, covers both direct and

indirect influence, including the creation of misleading impressions about a product's properties. Courts have confirmed that an advertisement can be unlawful even if there is no proof that it directly affects consumer behaviour; it is sufficient that it creates an inaccurate or incomplete image of the medicine. From a public health perspective, this underscores the need to assess pharmaceutical advertising objectively, through the eyes of an average consumer.

Supervisory powers in this area are vested in the Chief Pharmaceutical Inspector, who may order the suspension of unlawful advertising, require the publication of a correction, or demand removal of identified violations. These decisions are immediately enforceable, although they cannot be applied once an advertisement has already ceased to be broadcast. As a result, it has become common practice for advertisers to submit a declaration stating that an advertisement has been discontinued, which usually leads to the termination of administrative proceedings.

One important exception regarding advertising audiences is that advertisements must not be directed at children. More generally, court rulings stress that the "average consumer" of medicines cannot be equated with the average consumer of other goods. Patients are often in a weakened condition, which can reduce their ability to critically assess information, and older adults – who form a large share of medicine users – are typically more vulnerable to persuasion. For this reason, even advertising of OTC medicines addressed to the general public may pose risks to public health if it is excessive or poorly designed. Regulations on consumer information therefore need to ensure broad protection and promote the safe use of medicines through clear and reliable information.

While the legal framework sets the formal boundaries for pharmaceutical advertising, it is enforcement practice that reveals how these rules function in reality. Decisions of the Chief Pharmaceutical Inspector are not systematically published or regularly updated, which limits transparency. Consequently, administrative court rulings and the Inspectorate's own enforcement practice offer the most reliable insights into the application of advertising rules.

Analysis of the decisions of the Chief Pharmaceutical Inspector (2010–2024)

To illustrate how these rules function in practice, we reviewed the decisions of the Chief Pharmaceutical Inspector issued between 2010 and 2024 ordering the suspension of OTC advertising. Because a single advertisement frequently breached more than one provision, the figures reported

below refer to the number of times each provision was invoked rather than to the number of distinct decisions; in total, 46 citations concerned the Pharmaceutical Law and 20 concerned the Regulation of the Minister of Health of 21 November 2008 on the advertising of medicinal products [7]. The detailed distribution is presented in Table 2.

Table 2. Legal provisions cited in decisions of the Chief Pharmaceutical Inspector suspending OTC* advertising (2010–2024)

Provision	No. of citations	Share within basis**
Pharmaceutical Law (46 citations)		
Art. 53 para. 1 – non-misleading and objective presentation; information on rational use	15	33%
Art. 55 para. 2(2) – no appeal to recommendations of public figures, scientists or (apparent) health professionals	9	20%
Art. 55 para. 1 – prohibited content in advertising directed to the public	7	15%
Art. 56 para. 2 – consistency with the Summary of Product Characteristics (SmPC)	7	15%
Art. 56 para. 1 – no advertising of products not authorised for marketing	2	4%
Art. 57 para. 1 – no advertising of restricted (e.g. Rx-only) products to the public	2	4%
Art. 52 para. 1 – qualification of the communication as advertising	2	4%
Art. 60 para. 1 – advertising only by or on behalf of the marketing authorization holder	2	4%
Regulation of the Minister of Health of 21 November 2008 on the advertising of medicinal products (20 citations)		
§ 6(1) – mandatory elements of advertising directed to the public	10	50%
§ 7(1) – obligatory warning statement and its required wording	7	35%
§ 9(1) – presentation (legibility/audibility) of the warning in audiovisual advertising	3	15%

* OTC – over-the-counter; ** Percentages may not sum to 100% due to rounding

Source: Authors' own analysis based on decisions of the Chief Pharmaceutical Inspector [14].

Among the provisions of the Pharmaceutical Law, by far the most frequently cited was Article 53 para. 1, accounting for nearly one-third (33%) of all citations under that act. This provision embodies the core substantive standard of pharmaceutical advertising, requiring that it not be misleading

and that it present the product objectively while informing about its rational use. Its prominence indicates that the most common reason for intervention was not a purely formal defect but the way in which the product's properties were communicated to the consumer. The next most frequent grounds related to Article 55, which restricts the content of advertising addressed to the general public: in nine cases the advertisement improperly invoked the recommendations of well-known persons, scientists or individuals presented as having (or suggesting) medical or pharmaceutical qualifications (Art. 55 para. 2(2)), and in seven cases it contained other prohibited content, such as suggesting that a medical consultation could be avoided or guaranteeing a therapeutic outcome (Art. 55 para. 1). A comparable number of citations (seven) concerned Article 56 para. 2, i.e. advertising whose claims were inconsistent with the registered Summary of Product Characteristics (SmPC). The remaining provisions were each cited only sporadically.

The decisions based on the 2008 Regulation concerned exclusively the formal requirements imposed on advertising directed to the public. Half of these citations (50%) related to the omission of one or more mandatory elements that such advertising must contain (§ 6(1)), while 35% concerned the absence of the obligatory warning advising consumers to read the package leaflet or consult a doctor or pharmacist (§ 7(1)). The remaining cases (15%) addressed the manner in which this warning was presented in audiovisual advertising (§ 9(1)).

Notably, the number of decisions of the Chief Pharmaceutical Inspector was considerably higher in the early years of the study period than in later years, which may suggest either improved compliance by advertisers or a decline in enforcement activity. Taken together, these findings show that GIF enforcement targeted both the substance of advertising messages – chiefly misleading or non-objective presentation and improper appeals to authority – and the formal completeness of the information provided to consumers. The predominance of Article 53(1) and of the formal information requirements suggests that, even within the relatively narrow margin of what is lawful for OTC products, advertisements regularly fell short of the standards designed to protect the average consumer of medicines.

Survey Results

Table 3 presents the frequency of exposure to OTC drug advertising by sex and age group. Overall, women reported higher exposure than men, particularly in the youngest (18–25 years) and oldest (>60 years) age groups. A larger proportion of female respondents indicated seeing OTC medicine advertisements several times a day or several times a week. In contrast,

men more often reported exposure several times a month or less than once a month, although in the 26–40 and 41–60 age groups male respondents showed slightly higher rates of daily exposure. These findings suggest that women may generally be more frequently exposed to, or attentive to, OTC drug advertising, while age-related differences in exposure patterns can be observed among men.

Table 3. Frequency of exposure to OTC drug advertising*

Response	18–25	26–40	41–60	>60
Women (*n* = 106)				
Several times a day	5 (62%)	14 (67%)	5 (38%)	48 (75%)
Several times a week	2 (25%)	6 (29%)	5 (38%)	11 (17%)
Several times a month	1 (12%)	1 (5%)	2 (15%)	0 (0%)
Less than once a month	0 (0%)	0 (0%)	1 (8%)	5 (8%)
Men (*n* = 98)				
Several times a day	12 (50%)	14 (70%)	12 (40%)	14 (58%)
Several times a week	6 (25%)	4 (20%)	10 (33%)	4 (17%)
Several times a month	6 (25%)	2 (10%)	4 (13%)	0 (0%)
Less than once a month	0 (0%)	0 (0%)	4 (13%)	6 (25%)

* Percentages may not sum to 100% due to rounding

Advertising channels and formats

When asked which form of advertising they encountered most often (Table 4), respondents across nearly all groups pointed to television, and its dominance increased markedly with age – from roughly two-thirds of the youngest women to over 80% of those above 60, with a similar upward gradient among men. The clearest departure from this pattern was among the youngest men (18–25 years), three-quarters of whom identified online advertising as the channel they met most frequently, while internet exposure fell sharply in older groups. Radio and press advertising were marginal throughout. A broadly similar picture emerged when respondents indicated which advertising format they found most accessible (Table 5): television was again preferred, particularly by older respondents, whereas online advertising was the leading choice only among men aged 26–40. Among men aged 18–25 ($n = 24$), responses to the two channel items were inconsistent: online advertising was the channel most often encountered (75%; Table 4), yet none rated it as the most accessible, while 46% indicated press advertising, which none reported encountering most often (Table 5). This may reflect misinterpretation of the item on accessibility; results for this item in this subgroup should therefore be interpreted with caution.

Table 4. Advertising format encountered most often*				
Response	**18–25**	**26–40**	**41–60**	**>60**
Women (*n* = 106)				
Television advertising	5 (62%)	14 (67%)	10 (77%)	52 (81%)
Radio advertising	1 (12%)	3 (14%)	1 (8%)	5 (8%)
Online advertising	2 (25%)	3 (14%)	2 (15%)	2 (3%)
Press advertising	0 (0%)	0 (0%)	0 (0%)	5 (8%)
Other (e.g. posters, billboards)	0 (0%)	1 (5%)	0 (0%)	0 (0%)
Men (*n* = 98)				
Television advertising	4 (17%)	11 (55%)	18 (60%)	15 (62%)
Radio advertising	2 (8%)	2 (10%)	8 (27%)	3 (12%)
Online advertising	18 (75%)	4 (20%)	4 (13%)	5 (21%)
Press advertising	0 (0%)	2 (10%)	0 (0%)	1 (4%)
Other (e.g. posters, billboards)	0 (0%)	1 (5%)	0 (0%)	0 (0%)

* Percentages may not sum to 100% due to rounding

Table 5. Most accessible advertising format*				
Response	**18–25**	**26–40**	**41–60**	**>60**
Women (*n* = 106)				
Television advertising	4 (50%)	8 (38%)	7 (54%)	43 (67%)
Radio advertising	1 (12%)	4 (19%)	1 (8%)	11 (17%)
Online advertising	3 (38%)	4 (19%)	3 (23%)	5 (8%)
Press advertising	0 (0%)	3 (14%)	0 (0%)	5 (8%)
Other (e.g. posters, billboards)	0 (0%)	2 (10%)	2 (15%)	0 (0%)
Men (*n* = 98)				
Television advertising	12 (50%)	4 (20%)	16 (53%)	20 (83%)
Radio advertising	1 (4%)	1 (5%)	4 (13%)	1 (4%)
Online advertising	0 (0%)	12 (60%)	8 (27%)	3 (12%)
Press advertising	11 (46%)	3 (15%)	0 (0%)	0 (0%)
Other (e.g. posters, billboards)	0 (0%)	0 (0%)	2 (7%)	0 (0%)

* Percentages may not sum to 100% due to rounding

Attitudes towards and engagement with advertising

The reasons respondents gave for watching or listening to OTC advertisements suggest that exposure is largely passive (Table 6). Most participants either felt compelled to watch the advertisements or encountered them incidentally without paying attention to their content; this was especially pronounced among men, a majority of whom in every age group reported feeling forced to watch. Relatively few respondents treated advertisements

as a welcome source of information, although the youngest and the oldest women were somewhat more likely to ascribe informational value to them. Consistent with this passive engagement, what respondents recalled from advertisements tended to be peripheral or emotional cues – the depicted situation or the slogan – rather than substantive information such as the product name or its properties (Table 7). A substantial share, particularly in the 26–40 age group, reported remembering nothing at all.

Opinions on OTC advertising were divided (Table 8). A notable proportion of respondents, especially middle-aged men and women aged 41–60, regarded such advertising as unnecessary and stated that they always sought help from a specialist, while others – most often the youngest and the oldest women – found at least some advertisements interesting or a useful reminder of products they might need. Very few respondents endorsed the view that advertisements are a good source of information that should appear more frequently.

Table 6. Main reason for watching or listening to OTC advertisements*

Response	18–25	26–40	41–60	>60
Women (*n* = 106)				
I am forced to watch them	2 (25%)	8 (38%)	5 (38%)	21 (33%)
I come across them by chance and pay little attention to their content	2 (25%)	12 (57%)	5 (38%)	11 (17%)
I like advertisements; I treat them as entertainment	1 (12%)	0 (0%)	0 (0%)	11 (17%)
I willingly watch advertisements; one can learn a lot from them	2 (25%)	1 (5%)	0 (0%)	16 (25%)
Hard to say	1 (12%)	0 (0%)	3 (23%)	5 (8%)
Men (*n* = 98)				
I am forced to watch them	12 (50%)	12 (60%)	12 (40%)	14 (58%)
I come across them by chance and pay little attention to their content	6 (25%)	7 (35%)	14 (47%)	4 (17%)
I like advertisements; I treat them as entertainment	5 (21%)	1 (5%)	0 (0%)	0 (0%)
I willingly watch advertisements; one can learn a lot from them	1 (4%)	0 (0%)	0 (0%)	2 (8%)
Hard to say	0 (0%)	0 (0%)	4 (13%)	4 (17%)

* Percentages may not sum to 100% due to rounding

Table 7. What is remembered most often from a drug advertisement*

Response	18–25	26–40	41–60	>60
Women (*n* = 106)				
The product name	2 (25%)	2 (10%)	5 (38%)	11 (17%)
The advertising slogan	2 (25%)	5 (24%)	1 (8%)	21 (33%)
A product feature	1 (12%)	2 (10%)	3 (23%)	11 (17%)
The situation depicted in the advertisement	2 (25%)	3 (14%)	1 (8%)	16 (25%)
Nothing; I do not pay attention to advertisements	1 (12%)	9 (43%)	3 (23%)	5 (8%)
Men (*n* = 98)				
The product name	1 (4%)	4 (20%)	7 (23%)	2 (8%)
The advertising slogan	0 (0%)	2 (10%)	11 (37%)	6 (25%)
A product feature	11 (46%)	0 (0%)	4 (13%)	2 (8%)
The situation depicted in the advertisement	12 (50%)	4 (20%)	0 (0%)	6 (25%)
Nothing; I do not pay attention to advertisements	0 (0%)	10 (50%)	8 (27%)	8 (33%)

* Percentages may not sum to 100% due to rounding

Table 8. Opinion on OTC drug advertising*

Response	18–25	26–40	41–60	>60
Women (*n* = 106)				
They are a good source of product information and should appear much more often	1 (12%)	0 (0%)	1 (8%)	16 (25%)
Some are interesting and remind me of what I might need	5 (62%)	7 (33%)	1 (8%)	27 (42%)
Drug advertisements are unnecessary; I always seek help from a specialist	1 (12%)	7 (33%)	6 (46%)	16 (25%)
I have no opinion; they are indifferent to me	1 (12%)	7 (33%)	5 (38%)	5 (8%)
Men (*n* = 98)				
They are a good source of product information and should appear much more often	7 (29%)	0 (0%)	0 (0%)	0 (0%)
Some are interesting and remind me of what I might need	5 (21%)	1 (5%)	6 (20%)	6 (25%)
Drug advertisements are unnecessary; I always seek help from a specialist	7 (29%)	14 (70%)	8 (27%)	12 (50%)
I have no opinion; they are indifferent to me	5 (21%)	5 (25%)	16 (53%)	6 (25%)

* Percentages may not sum to 100% due to rounding

Influence on health-related behaviour

The reported influence of advertising on purchasing decisions of the Chief Pharmaceutical Inspector is summarized in Table 9. Most respondents stated that advertising had little effect on them, selecting either "rarely" or "never". Nonetheless, a meaningful minority acknowledged purchasing OTC medicines under the influence of advertising, occasionally buying products they did not need. This susceptibility was most evident among women aged over 60, of whom roughly one-third reported purchasing "often" under the influence of advertising and a further quarter "sometimes" – a finding of particular concern given that older adults form a large share of medicine users and, as noted in the legal analysis, are typically more vulnerable to persuasion. By contrast, the youngest men most frequently reported that this had never happened to them.

Table 9. Frequency of purchasing an OTC medicine under the influence of advertising*

Response	18–25	26–40	41–60	>60
Women (*n* = 106)				
Often; I find out what I need and make use of it	2 (25%)	1 (5%)	0 (0%)	21 (33%)
Sometimes it happens; occasionally I buy unnecessary products	1 (12%)	6 (29%)	1 (8%)	16 (25%)
Rarely; advertising has little influence on my decisions	4 (50%)	12 (57%)	10 (77%)	21 (33%)
It has never happened to me	1 (12%)	2 (10%)	2 (15%)	6 (9%)
Men (*n* = 98)				
Often; I find out what I need and make use of it	5 (21%)	0 (0%)	2 (7%)	4 (17%)
Sometimes it happens; occasionally I buy unnecessary products	7 (29%)	1 (5%)	4 (13%)	4 (17%)
Rarely; advertising has little influence on my decisions	0 (0%)	5 (25%)	16 (53%)	16 (67%)
It has never happened to me	12 (50%)	14 (70%)	8 (27%)	0 (0%)

* Percentages may not sum to 100% due to rounding

Reassuringly, when asked where they obtained information about medicines, the largest group across most age categories indicated consultation with a doctor or pharmacist (Table 10). Advertising nevertheless remained a notable source of information for the youngest and the oldest respondents. A more mixed picture emerged regarding protective behaviour at the point of purchase (Table 11): while some respondents reported reading the package

leaflet or consulting a professional whenever they wished to confirm a medicine's suitability, a considerable number – particularly older respondents and those who felt they already "knew" the medicines they bought – did so rarely or not at all.

Table 10. Main source of information about medicines*

Response	18–25	26–40	41–60	>60
Women (*n* = 106)				
From broadcast advertisements	3 (38%)	3 (14%)	2 (15%)	16 (25%)
From acquaintances	0 (0%)	2 (10%)	2 (15%)	5 (8%)
From the package leaflet	0 (0%)	2 (10%)	1 (8%)	11 (17%)
Consultation with a doctor or pharmacist	2 (25%)	11 (52%)	7 (54%)	32 (50%)
From other sources	3 (38%)	3 (14%)	1 (8%)	0 (0%)
Men (*n* = 98)				
From broadcast advertisements	6 (25%)	0 (0%)	2 (7%)	6 (25%)
From acquaintances	0 (0%)	1 (5%)	7 (23%)	2 (8%)
From the package leaflet	6 (25%)	2 (10%)	4 (13%)	0 (0%)
Consultation with a doctor or pharmacist	5 (21%)	17 (85%)	16 (53%)	16 (67%)
From other sources	7 (29%)	0 (0%)	1 (3%)	0 (0%)

* Percentages may not sum to 100% due to rounding

Table 11. Reading the leaflet or consulting a professional when buying an advertised medicine*

Response	18–25	26–40	41–60	>60
Women (*n* = 106)				
Often; the information provided in the advertisement is insufficient	0 (0%)	6 (29%)	3 (23%)	16 (25%)
Sporadically; the most important information is given in the advertisement	3 (38%)	1 (5%)	0 (0%)	5 (8%)
Rarely; only when I want to make sure the medicine will be suitable for me	4 (50%)	8 (38%)	7 (54%)	43 (67%)
I have no such need; I know the medicines I buy	1 (12%)	6 (29%)	3 (23%)	0 (0%)
Men (*n* = 98)				
Often; the information provided in the advertisement is insufficient	11 (46%)	8 (40%)	16 (53%)	6 (25%)
Sporadically; the most important information is given in the advertisement	12 (50%)	2 (10%)	0 (0%)	0 (0%)

Rarely; only when I want to make sure the medicine will be suitable for me	0 (0%)	6 (30%)	6 (20%)	6 (25%)
I have no such need; I know the medicines I buy	1 (4%)	4 (20%)	8 (27%)	12 (50%)

* Percentages may not sum to 100% due to rounding

Perception of risk and comprehension of advertising messages

Respondents' assessment of the safety of advertised medicines is presented in Table 12. A majority qualified their answer, agreeing that such medicines are safe provided they are used as intended. However, a striking share – about half of the youngest respondents of both sexes – equated the very fact that a medicine is advertised with its being safe, a belief that carries an evident public-health risk. Scepticism, expressed as the view that OTC medicines may do more harm than good, increased with age among men.

Table 12. Perceived safety of advertised medicines

Response	18–25	26–40	41–60	>60
Women (*n* = 106)				
Yes; otherwise they would not be advertised	4 (50%)	0 (0%)	0 (0%)	16 (25%)
Rather yes, but only if used as intended	4 (50%)	15 (71%)	7 (54%)	43 (67%)
Rather no; OTC medicines are too weak to cure but strong enough to harm	0 (0%)	4 (19%)	5 (38%)	5 (8%)
No; they harm more than they help	0 (0%)	2 (10%)	1 (8%)	0 (0%)
Men (*n* = 98)				
Yes; otherwise they would not be advertised	12 (50%)	3 (15%)	4 (13%)	5 (21%)
Rather yes, but only if used as intended	11 (46%)	14 (70%)	16 (53%)	7 (29%)
Rather no; OTC medicines are too weak to cure but strong enough to harm	1 (4%)	2 (10%)	8 (27%)	4 (17%)
No; they harm more than they help	0 (0%)	1 (5%)	2 (7%)	8 (33%)

This pattern of partial or mistaken understanding was even more apparent in respondents' interpretation of the advertising claim that a medicine "does not cause dependence" (Table 13). Comprehension of this phrase was frequently incorrect: many respondents, and older respondents in particular, interpreted it as a general assurance that the medicine could be used

long-term without harm or that it was free of adverse effects, rather than its actual meaning, namely, that the medicine can be discontinued without withdrawal symptoms. This misinterpretation provides a direct empirical illustration of the legal concern, discussed above, that pharmaceutical advertising may create an inaccurate or incomplete image of a medicine in the mind of the average consumer.

Finally, respondents' views on the adequacy of regulatory oversight were divided, with a sizeable proportion expressing no opinion (Table 14). Among those who took a position, a substantial share – especially in the 26–60 age groups – considered that supervision should be tightened, whereas the youngest respondents were the most likely to regard the current controls as fully sufficient. This appetite for stricter regulation was reinforced by responses to the final question: an overwhelming majority of participants in every age group considered that there are far too many OTC drug advertisements, and not a single respondent felt that there were too few (Table 15).

Table 13. Interpretation of the claim that a medicine "does not cause dependence"*

Response	18–25	26–40	41–60	>60
Women (*n* = 106)				
It can be used for a long time without harm to health	1 (12%)	4 (19%)	3 (23%)	21 (33%)
I can stop taking it at any time without unpleasant symptoms	2 (25%)	9 (43%)	4 (31%)	17 (27%)
It is safe in long-term use because it is free of adverse effects	4 (50%)	3 (14%)	3 (23%)	5 (8%)
I can take it only occasionally, as only then will it have the proper effect	0 (0%)	5 (24%)	2 (15%)	21 (33%)
I do not understand this term	1 (12%)	0 (0%)	1 (8%)	0 (0%)
Men (*n* = 98)				
It can be used for a long time without harm to health	6 (25%)	3 (15%)	6 (20%)	15 (62%)
I can stop taking it at any time without unpleasant symptoms	12 (50%)	13 (65%)	8 (27%)	1 (4%)
It is safe in long-term use because it is free of adverse effects	5 (21%)	0 (0%)	10 (33%)	2 (8%)
I can take it only occasionally, as only then will it have the proper effect	1 (4%)	2 (10%)	2 (7%)	0 (0%)
I do not understand this term	0 (0%)	2 (10%)	4 (13%)	6 (25%)

* Percentages may not sum to 100% due to rounding

Table 14. Opinion on the adequacy of supervision over drug advertising*				
Response	**18–25**	**26–40**	**41–60**	**>60**
Women (*n* = 106)				
Yes; the controls are entirely sufficient	3 (38%)	0 (0%)	0 (0%)	21 (33%)
Rather yes, although in some cases the rules should be more restrictive	1 (12%)	10 (48%)	3 (23%)	5 (8%)
Rather no; in most cases supervision should be tightened	1 (12%)	3 (14%)	2 (15%)	5 (8%)
No; the requirements for advertising should be considerably stricter	0 (0%)	4 (19%)	5 (38%)	12 (19%)
I have no opinion on this	3 (38%)	4 (19%)	3 (23%)	21 (33%)
Men (*n* = 98)				
Yes; the controls are entirely sufficient	12 (50%)	0 (0%)	4 (13%)	4 (17%)
Rather yes, although in some cases the rules should be more restrictive	0 (0%)	6 (30%)	8 (27%)	2 (8%)
Rather no; in most cases supervision should be tightened	6 (25%)	2 (10%)	6 (20%)	0 (0%)
No; the requirements for advertising should be considerably stricter	0 (0%)	8 (40%)	6 (20%)	6 (25%)
I have no opinion on this	6 (25%)	4 (20%)	6 (20%)	12 (50%)

* Percentages may not sum to 100% due to rounding

Table 15. Opinion on the quantity of OTC drug advertisements*				
Response	**18–25**	**26–40**	**41–60**	**>60**
Women (*n* = 106)				
There are far too few	0 (0%)	0 (0%)	0 (0%)	0 (0%)
There are far too many	4 (50%)	13 (62%)	8 (62%)	37 (58%)
The current amount is optimal	3 (38%)	7 (33%)	4 (31%)	16 (25%)
I have no opinion on this	1 (12%)	1 (5%)	1 (8%)	11 (17%)
Men (*n* = 98)				
There are far too few	0 (0%)	0 (0%)	0 (0%)	0 (0%)
There are far too many	14 (58%)	16 (80%)	18 (60%)	14 (58%)
The current amount is optimal	9 (38%)	0 (0%)	6 (20%)	8 (33%)
I have no opinion on this	1 (4%)	4 (20%)	6 (20%)	2 (8%)

* Percentages may not sum to 100% due to rounding

Discussion

The review of the decisions of the Chief Pharmaceutical Inspector issued between 2010 and 2024 makes it possible to identify recurring mechanisms of infringement in the advertising of OTC medicines. The most frequently established ground for suspending an advertisement was a breach of Article 53 para. 1 of the Pharmaceutical Law, which prohibits messages liable to mislead the consumer and requires an objective presentation of the product. Other common grounds were Article 55 para. 2(2), which prohibits advertising directed to the public from appealing to the recommendations of public figures, scientists or persons presented as having medical or pharmaceutical qualifications, and Article 56 para. 2, which prohibits content inconsistent with the SmPC. In many cases at least two legal grounds applied simultaneously, suggesting that the advertisements distorted both their substantive content and their manner of narration, thereby creating a risk of misinforming the audience.

The cases analyzed in this paper revealed characteristic irregularities. The elements most often challenged were the attribution to products of properties going beyond their authorized indications, the emphasis on an efficacy or effect not reflected in the SmPC, and the construction of strongly emotional messages designed to manipulate the recipient. Marketing practices of this kind are consistent with international research indicating that consumer-directed advertising of medicines, including non-prescription products, frequently contains claims that are potentially misleading or not supported by clinical evidence [8,9]. In this context, the GIF performs a protective function with respect to individual health, preventing the misinterpretation of advertising messages and inappropriate self-medication.

Although GIF interventions led to the suspension of individual advertisements, many infringements concerned messages disseminated by marketing authorization holders that appeared repeatedly among the challenged OTC advertisements. This may suggest that the administrative sanctions applied to advertisers are insufficient. It is therefore worth considering tightening administrative penalties, establishing close cooperation between the supervisory bodies and the media, developing effective large-scale tools for monitoring OTC drug advertising and broadening consumer education regarding marketing messages.

The publication of a decision suspending an advertisement carries negative consequences for the marketing authorization holder, associated with a weakened image and a loss of consumer trust. In the later years of the study period a smaller number of decisions suspending OTC advertisements was observed, which may indicate either more diligent compliance

by advertisers or difficulties in detecting irregularities, potentially resulting from the vastness of the internet as a medium.

A limitation of this review is that it relied on publicly available decisions of the Chief Pharmaceutical Inspector, without access to additional documents, which is particularly relevant for decisions that do not contain full justification. Incomplete information of this kind may limit the detail and accuracy with which the reasons for suspending advertisements can be classified. In addition, the analysis concerned only OTC drug advertising and did not cover dietary supplements and medical devices, which attract consumer attention within the same market segment.

Several limitations of the survey component should also be noted. The sample was a convenience sample drawn from a single, largely rural district and is therefore not statistically representative of the Polish population; in particular, women aged over 60 were substantially overrepresented (64 of 106 female respondents), which may bias age- and sex-stratified estimates. The questionnaire was an original, non-validated instrument, so its measurement properties are unknown. Finally, several subgroups were small (e.g. eight women aged 18–25), which limited statistical power; the survey analyses are exploratory and should be interpreted with caution despite adjustment for multiple testing.

The survey revealed varied consumer attitudes towards the advertising of non-prescription medicines, both in terms of information sources and the influence of advertising on purchasing behaviour. The high intensity of advertising material reaching recipients is not without significance for the shaping of consumers' health beliefs. The results indicate that, although advertising is ubiquitous and often perceived as intrusive, its actual influence on purchasing decisions remains limited. These findings are consistent with those of Radlińska et al., who reported that only about 12.4% of respondents declared that OTC advertising had directly influenced their decision to purchase a medicine [10]. Advertising appears to operate indirectly: by building awareness and trust, by influencing consumers' emotions and by generating a form of psychological pressure.

Television was the most frequently indicated form of advertising, which is consistent with a content analysis of advertising on nationwide Polish television channels, in which OTC medicines, dietary supplements and medical devices accounted for 29.5% of all broadcast advertisements [11]. The most accessible form of advertising is one that engages several senses, and audiovisual advertising is therefore the best received by audiences. At the same time, online advertising was the channel most often encountered by the youngest men, and the one most often rated as the most accessible by men aged 26–40 particularly among men aged 18–25, who considered it the most

accessible form. This trend corresponds with the growing role of digital channels, including social media and online pharmacies, in the marketing of OTC medicines [12].

A relatively low proportion of respondents regarded advertisements as a credible source of knowledge about medicines. This is consistent with the findings of Radlińska et al., in which only 4.2% of respondents regarded advertising as a good source of information about medicines [10]. In a study of adults over 60 years of age (n = 84), OTC purchase decisions were most often based on the advice of a family doctor (39%) or a pharmacist (31%) [13]. Advertisements provide very limited information about a medicine and omit many important details; as a form of communication they are biased, present the product in a favourable light, and are intended to create a need to purchase. Notably, respondents over 60 years of age more often indicated consultation with a doctor or pharmacist, which may stem from a greater need for safety in pharmacotherapy and for contact with a specialist. A considerable proportion of consumers base their health decisions on their own beliefs; the extent to which these coincide with the current state of medical knowledge, and the extent to which they are shaped by the opinions of acquaintances and by advertising, remains an open question. Most often, respondents encounter advertising in a form that cannot be avoided; such incidental exposure, even though it does not consciously engage the recipient's perception, exerts a measurable influence on their health decisions. Information presented in advertisements is absorbed subconsciously: brand names and packaging become familiar, which reduces psychological distance and increases the likelihood of choosing these products.

The survey results show that in the extreme age groups – among the youngest adults and people over 60 – the proportion of respondents declaring purchases under the influence of advertising was higher than in the other groups. This may suggest a greater susceptibility to marketing messages at stages of life characterized by less experience with self-medication or by a heightened susceptibility to the promise of a rapid therapeutic effect.

This tendency is consistent with the findings of Radlińska et al., who showed that a substantial proportion of respondents (almost 20%) were unsure whether advertising had influenced their purchases or their trust in medicines. At the same time, many respondents indicated that advertising had led to a mistaken self-assessment of their health, an overestimation of therapeutic properties, or a downplaying of risk. In that study, even where conscious declarations of advertising influence were limited, consumers reported a sense of anxiety provoked by advertising messages, as well as experiences suggesting that failing to purchase an advertised OTC medicine

could lead to a deterioration of health [10]. These effects may reflect a subconscious accumulation of advertising exposure.

These results are echoed by the study of Szpringer et al., which observed that the overwhelming majority of respondents use OTC medicines and that the intensive promotion of medicines in the mass media makes advertising one of the important factors prompting consumers to purchase [4].

The variation in responses concerning the understanding of the message that a medicine "does not cause dependence" reveals an important problem related to the perception of advertising content and language. Some respondents interpreted this phrase as the possibility of long-term use without risk, which points to a potential danger of the excessive and improper use of OTC medicines. The majority of respondents are aware that the safety of OTC medicines is conditional on their rational use. The real risk associated with the overuse of non-prescription medicines is also highlighted by Szpringer et al. [4].

The survey results also indicate a critical attitude among consumers towards the intensity of advertising present in the media. More than half of the respondents judged the number of OTC drug advertisements to be excessive and potentially burdensome for the recipient. This may reflect growing fatigue with the surfeit of marketing content and a need for greater regulation in this area.

OTC drug advertising plays an important but limited role in shaping consumer behaviour. Its impact differs according to age, sex and the level of trust in other sources of information. On the one hand, advertising campaigns contribute to building consumers' product and health awareness; on the other, the risk of misinterpreting advertising messages points to the need to strengthen regulatory oversight and patient health education.

Conclusions

1. OTC drug advertisements are widely present in the media, but their influence on consumers' purchasing decisions is moderate and varies by sex and age. Television remains the dominant advertising channel, although the importance of online advertising is growing among younger adults, which highlights the need to monitor new forms of promotion.
2. Excessive exposure to OTC drug advertising creates a risk of self-diagnosis and unnecessary pharmacotherapy. This points to the need for further patient health education and for more precise control of advertising messages.
3. The current regulatory system, although it clearly defines the legal and ethical boundaries of advertising, appears insufficient in terms of the

effectiveness of supervision and the sanctions applied. Recurring infringements demonstrate that some commercial entities may treat administrative sanctions as a cost of doing business.
4. It appears justified to tighten the penalties imposed on marketing authorization holders that repeatedly commit infringements, and to strengthen oversight of online advertising – in particular the practices of influencers, which may strongly affect younger groups of consumers.
5. Given the specific nature of the products promoted, OTC drug advertisements should be subject to detailed linguistic and substantive verification in order to minimize the risk of emotional manipulation and of the message being misperceived by patients.

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Appendix S1. Survey questionnaire (English translation)

Original title: *Ankieta dotycząca odbioru reklamy leków OTC przez konsumentów* (*Survey on consumer perception of OTC medication advertising*). The survey was addressed to persons without medical or pharmaceutical education and with no professional ties to these sectors. All items are single-choice.

1. Sex
☐ Female
☐ Male
2. Age
☐ 18–25 years
☐ 26–40 years
☐ 41–60 years
☐ Over 60 years

3. How often are you exposed to advertisements for over-the-counter (OTC) medicines?
☐ Several times a day
☐ Several times a week
☐ Several times a month
☐ Less than once a month
4. Which form of drug advertising do you encounter most often?
☐ Television advertising
☐ Radio advertising
☐ Online advertising
☐ Press advertising
☐ Other, e.g. posters, billboards
5. Which form of advertising is most accessible to you?
☐ Television advertising
☐ Radio advertising
☐ Online advertising
☐ Press advertising
☐ Other, e.g. posters, billboards
6. Why do you most often watch/listen to OTC drug advertisements?
☐ I am forced to watch them; I wait for them to end
☐ I come across them by chance and pay little attention to their content
☐ I like advertisements; I treat them as entertainment
☐ I willingly watch advertisements; one can learn a lot from them
☐ Hard to say
7. What do you most often remember from a drug advertisement?
☐ The product name
☐ The advertising slogan
☐ A product feature
☐ The situation depicted in the advertisement
☐ Nothing; I do not pay attention to advertisements
8. What is your opinion on OTC drug advertisements?
☐ They are a good source of product information and should appear much more often
☐ Some are interesting and remind me of what I might need
☐ Drug advertisements are unnecessary; I always seek help from a specialist
☐ I have no opinion; they are indifferent to me
9. How often do you purchase an OTC medicine under the influence of advertising?
☐ Often; I find out what I need and make use of it
☐ Sometimes it happens; occasionally I buy unnecessary products

☐ Rarely; advertising has little influence on my decisions
☐ It has never happened to me

10. Where do you most often obtain information about medicines?
☐ From broadcast advertisements
☐ From acquaintances
☐ From the package leaflet
☐ Consultation with a doctor or pharmacist
☐ From other sources

11. When buying an advertised medicine, do you often read the package leaflet or consult a pharmacist or doctor?
☐ Often; the information provided in the advertisement is insufficient
☐ Sporadically; the most important information is given in the advertisement
☐ Rarely; only when I want to make sure the medicine will be suitable for me
☐ I have no such need; I know the medicines I buy

12. Do you think that advertised medicines are safe for health?
☐ Yes; otherwise they would not be advertised
☐ Rather yes, but only if used as intended
☐ Rather no; OTC medicines are too weak to cure but strong enough to harm
☐ No; they harm more than they help

13. How do you understand the statement that a medicine "does not cause dependence"?
☐ It can be used for a long time without harm to health
☐ I can stop taking it at any time without unpleasant symptoms
☐ It is safe in long-term use because it is free of adverse effects
☐ I can take it only occasionally, as only then will it have the proper effect
☐ I do not understand this term

14. Do you think that oversight of the legal and substantive side of advertising is sufficient?
☐ Yes; the controls are entirely sufficient
☐ Rather yes, although in some cases the rules should be more restrictive
☐ Rather no; in most cases supervision should be tightened
☐ No; the requirements for advertising should be considerably stricter
☐ I have no opinion on this

15. What is your opinion on the quantity of OTC drug advertisements?
☐ There are far too few
☐ There are far too many
☐ The current amount is optimal
☐ I have no opinion on this

Author Contributions
Conceptualization: P.P., M.S.; Methodology: P.P.; Formal analysis: P.P.; Investigation: P.P., A.Ł.-S.; Writing – original draft preparation: P.P., A.Ł.-S.; Writing – review and editing: A.Ł.-S., M.S.; Supervision: M.S. All authors have read and agreed to the published version of the manuscript.

Supplementary Materials
The following supplementary material is available with this article: Appendix S1: Survey questionnaire (English translation).

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Ethics Approval Statement
The study was conducted as an anonymous and voluntary questionnaire survey among adults. Participation was entirely voluntary, and all respondents were informed about the purpose of the study prior to participation. The research was carried out as part of the postgraduate programme Pharmaceutical Management: Innovation and Drug Development. The study did not involve any medical intervention, collection of sensitive personal data or procedures posing risk to participants.

Informed Consent Statement
Informed consent was obtained from all subjects involved in the study.

Data Availability Statement
The data presented in this study are available from the corresponding author upon reasonable request.

Declaration of Generative AI Use
The authors used Claude (Anthropic) for language editing and improvement of the manuscript's English style, and to assist in drafting the R code that the authors used to perform the statistical analysis and generate the figures. All scientific content, data analysis, interpretation of results, conclusions and final editorial decisions were performed and verified by the authors, who take full responsibility for the content of the manuscript.

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Conflicts of Interest
M.S. currently serves as the Associate Editor of this journal. In accordance with the journal's editorial policy and COPE guidelines, M.S. was completely unaware of the peer review process and could not make any editorial decisions regarding this manuscript. The peer review process and final decision were independently managed by an independent second editor with no conflict of interest on the Editorial Team. The authors declare that they have no financial or non-financial conflicts of interest that could have influenced, or could be perceived to have influenced, the research, interpretation of the results, or preparation of this manuscript.