FROM FIELD TO CONSUMER: A COMPREHENSIVE ANALYSIS OF MEDICINAL AND AROMATIC PLANT PRODUCT PREFERENCES THROUGH GENERATIONS

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Abstract

The aim of the study was to investigate consumer behaviour and preferences regarding products containing medicinal and aromatic plant ingredients among age generations. Statistical program XLSTAT 2022.4.1 was used to evaluate 375 replies from a larger database for examination with using multiple correspondence analysis and non-parametric tests. The findings showed that the key factor in the process of buying medicinal and aromatic plant products for treating and preventing illnesses was the quality of the product. Research results pointed out that ingredients, scientifically confirmed benefits, labelling details, origin of raw materials, absence of synthetic components, and the scent of the product are also important determinants of purchase. Moreover, the research revealed that consumers from Generation Z do not use medicinal and aromatic plant products for cosmetics, personal care purposes, or the prevention and/or treatment of several illnesses, while Generation Y, along with Generation X and Baby Boomers, tend to use them. Generation Y uses these products for both cosmetics and treatment purposes for 1 - 9 years or more. Studying consumers of herbal and aromatic products across generational lines can provide distinct consumer patterns with a significant impact on the development of products and marketing strategies tailored to the specific requirements of each generation.

Key words: *medicinal and aromatic plants, consumer, behaviour, generations, information*

INTRODUCTION

Medicinal and aromatic plants (MAPs) have made an enormous contribution to the improvement of human lifestyle since ancient times, being used for food, cosmetics, personal care and medical purposes [23]. Laboratory research using chromatographic tools has revealed the existence of bioactive compounds unique to these plants, giving them great potential for exploitation in the pharmaceutical and cosmetic sectors [23]. Moreover, consumers from traditional as well as contemporary societies have utilized products derived from medicinal and aromatic plants. Regarding the latter, [1] showed an increase in consumer interest in these products in recent decades in most EU member states, especially in Germany, the United Kingdom and Portugal. European countries are divided into MAP producing and MAP consuming countries [1]. Therefore, producers and processors in various industries - food, cosmetics, pharmaceuticals - need to ensure that the supply of MAP products meets consumer needs and preferences. This can be done by conducting market research [21]. By segmenting consumers of MAP products by generation, certain consumption patterns can be identified that have significant implications for companies wishing to align themselves with the latest consumer trends. This approach enables the development of tailored products and marketing strategies [10].

According to a study by Goldman Sachs Global Investment Research [13], millennials as the generation of digital natives, are reshaping their shopping habits due to their strong inclination towards technology. This

generation was born into an emerging world of technology and is more digitally active than any previous generation [17]. Millennials have different consumption behaviours compared to other generations: they are used to gathering information about products instantly, the buying process is a moment of pleasure for them, their loyalty to the brands they buy is relative and they are interested in discounts [16]. Their values in terms of purchasing behaviour are based on social responsibility and environmental protection, and they are interested in brand authenticity, local sourcing, and ethical production [5]. Similarly, Generation Z is made up of people who grew up in a world where technology and information were always at their fingertips. They are considered the first generation of true digital natives, and truth-seeking is characteristic of their consumption behaviour [11]. This segment of consumers pays high attention to the impact their purchasing decisions have on the environment and are concerned with ethical issues, with consumption being an expression of individual identity, contributing to their personal development [4]. Millennials are known for their preference for natural and sustainable products. Compared to older generations, millennials place greater importance on health maintenance products, as well as all-natural cosmetics and personal care products, with a high emphasis on the source and quality of the ingredients used. Safety, sustainability and traceability of these products are important aspects sought by millennial consumers [15]. Similarly, consumption behaviour among Generation Z is largely influenced by their values. These young people are concerned about the environment and are keen to buy products that have a low impact on both the environment and are the generation most committed to incorporating sustainability aspects into their activities [6]. Young people in Generation Z, who represent the future of our society, pay increasing attention to buying eco-friendly products [4]. Studies in the literature show that people with a positive environmental mindset are predisposed to purchase cosmetics that are natural and

environmentally friendly [2]. [14] conducted a study among young female Generation Z and Millennials in Vietnam with the aim of understanding the factors that influence purchase intentions of green cosmetics. They showed that Vietnamese youth are increasingly interested in natural and organic products, with knowledge of these products positively correlated with purchase intentions [14].

Promoting herbal and aromatic products by highlighting eco-friendly attributes such as no animal testing, recyclable labels and packaging, less water use, reduced pollution has a positive influence among consumers belonging to generation Y and Z whilst encouraging consumption of these products [20]. Preference for MAP products is affected by generational, as well as socio-demographic characteristics of consumers. Findings from earlier research have indicated a greater interest in the consumption of MAP products among highly educated consumers aged between 41 and 60, mainly belonging to generation X [12, 18, 19]. Qualitative research among German consumers revealed differences in the choice of herbal products according to different age groups, defined as young consumers (18-35 years), middle-aged consumers (36-59 years) and older consumers (elderly, over 60 years) [24]. Thus, treating ailments was an important reason for consumption of MAP products for all age groups, preventing ailments was an important reason for both middle-aged and elderly, and maintaining health was a valid reason for consumption only for the elderly [24]. Regarding the consumption of MAP products among children and teenagers, higher consumption was observed among those with poorer health status, moderate participation in sports activities and a diet rich in fruits and vegetables [8]. According to a study by [15], millennials represent the largest potential group of MAP-derived product purchasers, accounting for approximately 32% of the global population, in contrast to 17% of individuals aged 55 and above (specifically baby boomers and older).

[3] analysed the knowledge of medical students aged 19-24 (representatives of

Generation Z) regarding the use of medicinal plants and interactions between plants and medicines. Most students (95.45%) were aware that medicinal plants can be used as medicines, 46.85% believed that herbal medicines are safe, and the majority (55.6%) were not aware that there may be interactions between the consumption of MAP products and certain medicines. The same study reveals that the media and older family members were the most common sources of information for students about MAP products [3]. To meet the needs of millennials, marketing strategies must be done through technology and social media [16]. Marketing through social media and mobile phones is also necessary for Generation Z, as they are very active on social media, constantly searching online for information about products they want to buy. They seek reviews, advice, and recommendations from other users, which help them to make informed decisions and choose the right products for their needs [4]. Contrary to millennials and Generation Z, members of Generation X have less trust in online information tend to be conservative and independently search for further information about products and companies, mainly because they became acquainted with mobile devices and social networks during their adulthood [7]. In addition, millennials are willing to spend more on cosmetics and personal care products produced by natural ingredients, in comparison with consumers from Generation X and Baby Boomers [15]. Consumers of the youngest Generation Z are sensitive to the price and choose affordable products, but they are open to spending more on natural and organic beauty and personal care items that contribute to their emotional health and well-being [9]. In Romania, there are no studies analysing the consumption behaviour of different generations with regard to products made from herbs. There is also no research to analyse consumer confidence in various sources of information on these products.

Identifying this gap in the scientific research area and considering the need to develop the marketing of MAP products in the context of the Romanian market, the authors of the present study aimed to carry out an analysis of the consumption behaviour of different generations for MAP products in Romania, as well as their sources of information, in order to identify consumption patterns and their influence on marketing strategies.

After reviewing the literature and defining the purpose of the research, the following research questions emerged:

Q1: What are the key characteristics of the consumer behaviour of Baby Boomers, Generation X, Millennials and Generation Z regarding MAP products?

Q2: What are the main sources of information used by different generations to learn about MAP products?

Q3: What are the factors that influence the purchase decisions of consumers of different generations in relation to MAP products?

Q4: What are the significant generational differences in preferences and consumption patterns for MAP products?

Q5: How can the results of this research be used to develop generation-specific marketing strategies in the MAP industry in Romania?

MATERIALS AND METHODS

The research is based on the analysis of 375 responses from a larger database. These responses were collected in 2020, based on a sociological survey conducted among consumers of MAP products in the city of Cluj Napoca in Romania.

From a questionnaire survey designed to evaluate consumers' perceptions and behaviours concerning the using of medicinal and aromatic plant products, the present paper focuses on two specific aspects:

The first aspect is aimed at using of medicinal and aromatic plants for the prevention and treatment of illnesses. This section included concerns about health risks linked to examined products, their compatibility with conventional treatments, awareness of possible drug interactions, beliefs regarding the scientific validation of therapeutic properties, preferred sources of information and factors influencing the decision to purchase these products.

The second aspect is focused on using of

medicinal and aromatic plants for cosmetic and personal care purposes. This section focused on consumers' typical usage habits of cosmetic and personal care products incorporating ingredients derived from medicinal and aromatic plant, their perceptions of associated risks, views on the necessity of scientific validation, interest in customized products and preferred sources of information.

The 375 responses were grouped into 3 categories, according to the age of the respondents: 125 responses belonging to Generation Z (18 - 26 years), 125 responses belonging to Generation Y (27 - 42 years) and 125 responses belonging to Generation X and Baby Boomers (43 - 72 years).

The Baby Boomer generation includes consumers born between 1946 and 1964, a period a period which is distinguished by the boom in population after World War II and the aftermath of conflict and economic reconstruction. Generation X, born between 1965 and 1979, grew up in an era of peace after the end of the Second World War. Millennials or Generation Y, born between 1980 and 1994, and Generation Z, born between 1995 and 2009, are known for their use of technology and adaptability to the digital environment. These broad segmentations provide insight into the different experiences and values of each generation, with significant implications for product development and marketing strategies.

Multiple correspondence analysis (MCA) was used to investigate differences across selected generations in case of multiple-choice questions (use of medical and aromatic plant products for cosmetic and personal care purposes, and for the prevention and treatment of different diseases; duration of using medical and aromatic plant products for cosmetic and personal care purposes, as well as for the prevention and treatment of various illnesses). Chi-square test was implemented to study differences across generations. Friedman test and Nemenyi method were applied to identify statistically significant differences in consumer evaluations towards source of information as well as aspects affecting the purchase of medicinal and aromatic plant products for the prevention and treatment of various illnesses. All statistical tests were calculated by using statistical software XLSTAT 2022.4.1 (Addinsoft, NY, USA).

RESULTS AND DISCUSSIONS

The consumer study investigated the influence of information sources on consumers' choices and decisions regarding the usage of cosmetics and other personal care products with medicinal and aromatic herbal ingredients. Consumers, who use MAP products for cosmetic and personal care (CPC) purposes, evaluated potential sources of information on a scale from 1 to 5, where 1 represents lower trust, and 5 represents higher trust. The study results, including means, indicated that the consumers place the greatest trust in information obtained from specialized doctors (mean = 4.13), specialized books (mean = 3.96), pharmacists (mean = 3.72), cosmeticians (mean = 3.46), producers (mean = 3.36), and staff in specialized stores (mean = 3.24). In contrast, the results revealed that influencers (mean = 1.90), friends and relatives (mean = 2.72), as well as the internet and mass-media (mean = 2.88) are considered the least trustworthy source of information based on which consumers make decisions. In the context of the influence of information sources on consumers, the Friedman test and subsequent Nemenyi procedure were applied, highlighting statistically significant differences in consumer evaluations among various information sources. These differences are graphically illustrated by a Demsar plot (Figure 1).

Consumers who use MAP products for the prevention and treatment of various illnesses assessed the impact of selected aspects on their purchasing behaviour on a scale ranging from 1 to 5, where 1 represents insignificance and 5 represents high significance.

The research results and means revealed that the most crucial factors influencing the purchase of the MAP products include product quality (mean = 4.40), product composition (mean = 4.25), label information

(mean = 3.95), scientifically proven therapeutic properties (mean = 3.92), origin of raw materials (wild or cultivated flora) (mean = 3.61), use of ecological raw materials (mean = 3.50), certified organic product (mean = 3.48), and Romanian product origin (mean = 3.39).
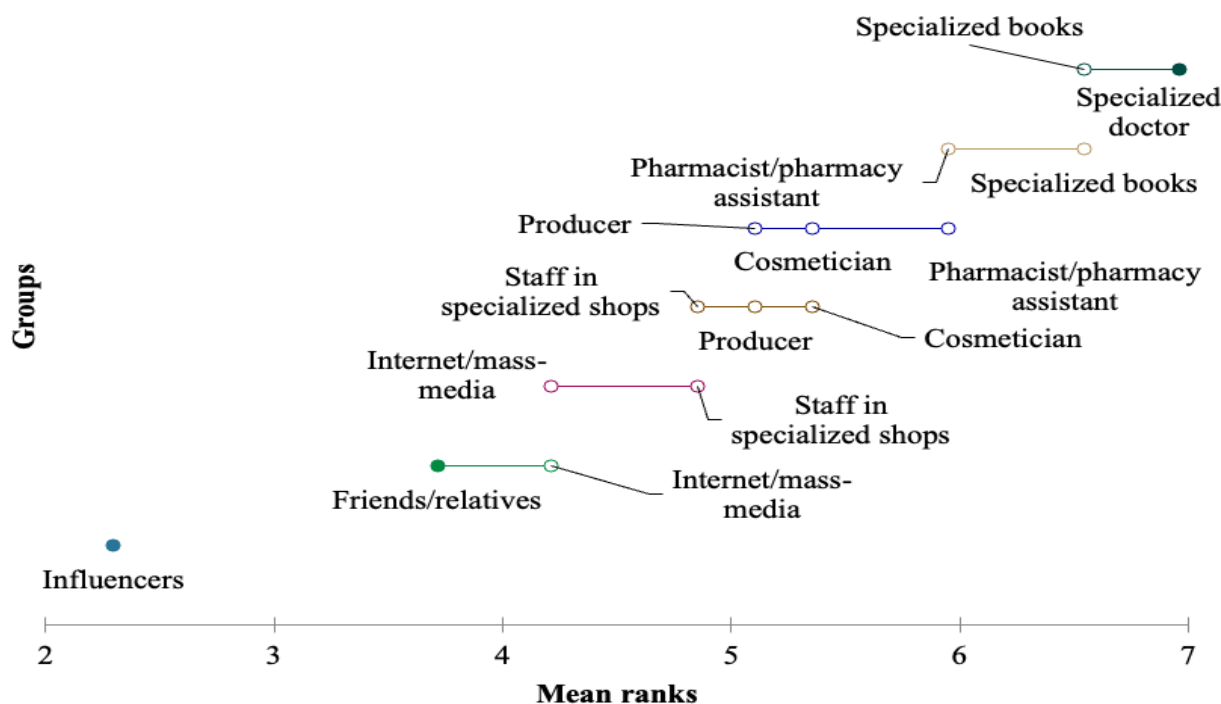

Fig. 1. Confidence in sources of information based on which consumers make decisions about MAP products for CPC purposes
Source: Own calculation.

Table 1. Evaluation of aspects affecting the purchase of MAP products for the prevention and treatment of various illnesses

Sample	Frequency	Mean of ranks	Groups						
Brand	165	5.091	A						
Advantages offered (promotions, discounts)	165	5.188	A	B					
Use of recyclable packaging	165	5.309	A	B					
Product traceability information	165	5.933	A	B	C				
Advantageous product price	165	6.136	A	B	C				
Romanian product	165	6.545		B	C				
Certified organic product	165	6.836			C	D			
Use of environmentally friendly raw materials	165	7.006			C	D	E		
Source of raw material	165	7.255			C	D	E		
Scientifically proven therapeutic properties	165	8.176				D	E	F	
Label information	165	8.315					E	F	
Composition of the preparation	165	9.367						F	G
Product quality	165	9.842							G

Source: Own calculation.

Conversely, less importance is attributed to aspects such as brand (mean = 2.87), advantages offered, including promotion or discounts (mean = 2.91), use of recyclable packaging (mean = 2.98), product traceability information (mean = 3.23), and advantageous product price (mean = 3.26). Furthermore, the Friedman test revealed statistically significant differences in the evaluation of aspects determining the purchase of MAP products (p-value =< 0.0001) and post-hoc Nemenyi method demonstrated the existence of differences among the examined aspects (Table 1).

In this research, the utilization of MAP products for CPC applications, as well as their use in preventing and treating different diseases, was further investigated among consumers of different age groups. The applied Multiple Correspondence Analysis (Figure 2) demonstrated that Generation Z neither utilize MAP products for CPC purposes, nor for preventing and treating different diseases. Additionally, the results indicate that consumers from Generation Y utilize MAP products for both CPC needs, as well as for preventive and treatment purposes. However, the oldest consumers from Generation X and Baby Boomers behave differently. The findings revealed that consumers either use or do not use MAP products for CPC reasons, as well as for the therapeutic purposes.
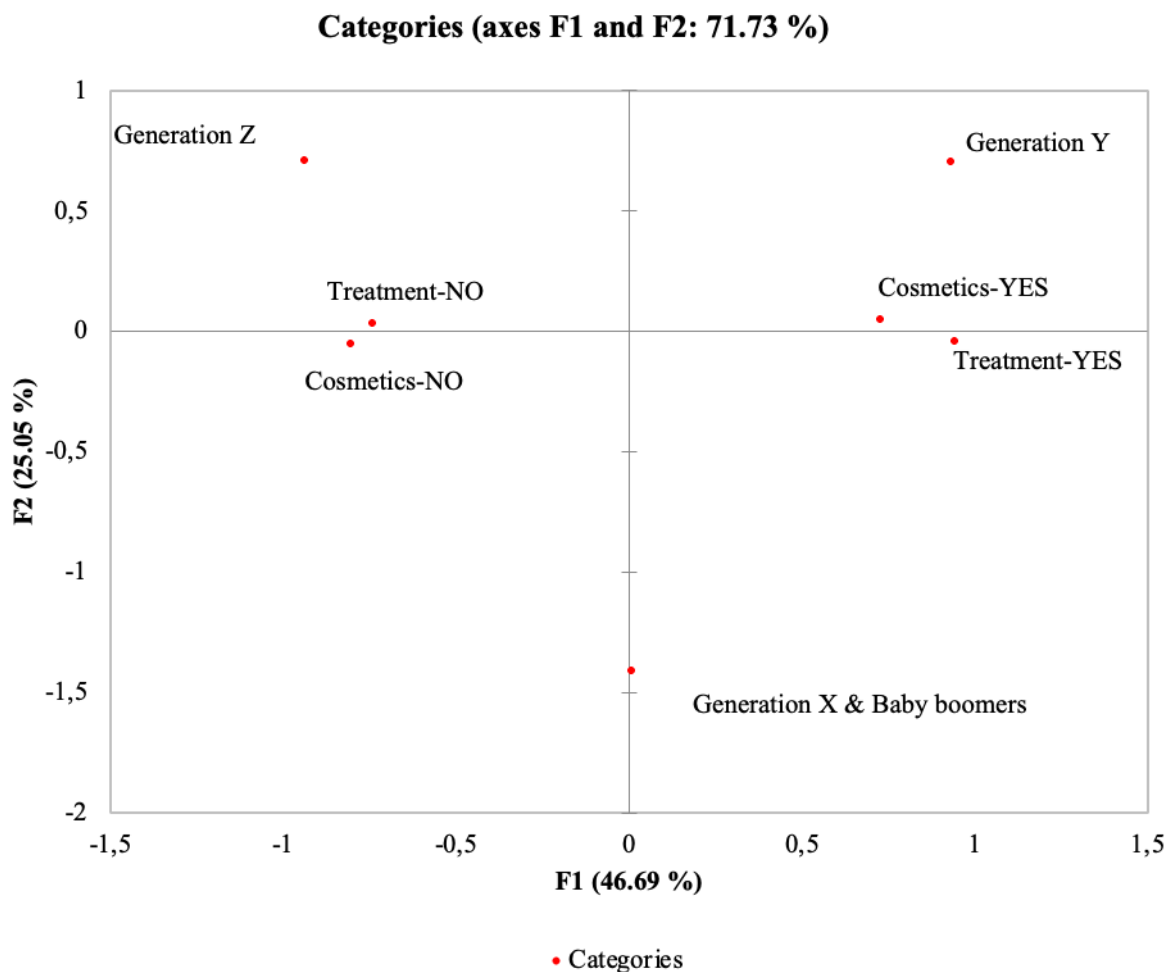

Fig. 2. Use of MAP products for CPC purposes, and for the prevention and treatment of various illnesses across different age generations
Source: Own calculation.

In the context of results related to the use of MAP products for CPC purposes, as well as for the prevention and treatment of different diseases, the study also focused on investigating differences in usage duration among age generations. The results of the Multiple Correspondence Analysis (Figure 3) indicated that the youngest consumer generation does not use MAP products for cosmetics or treatment at all, or for less than 1 year. Consumers from Generation Y use MAP products for CPC purposes and for illnesses prevention and treatment, for durations ranging from 1 to 9 years or from 10 to 19 years. The duration of product usage for CPC and therapeutic purposes, was assessed most

differently in Generation X and Baby Boomers. Consumers in these generations use products for cosmetic and treatment reasons for less than 1 year, but there are also those who use them for durations ranging from 1 to 9 years or from 10 to 19 years.
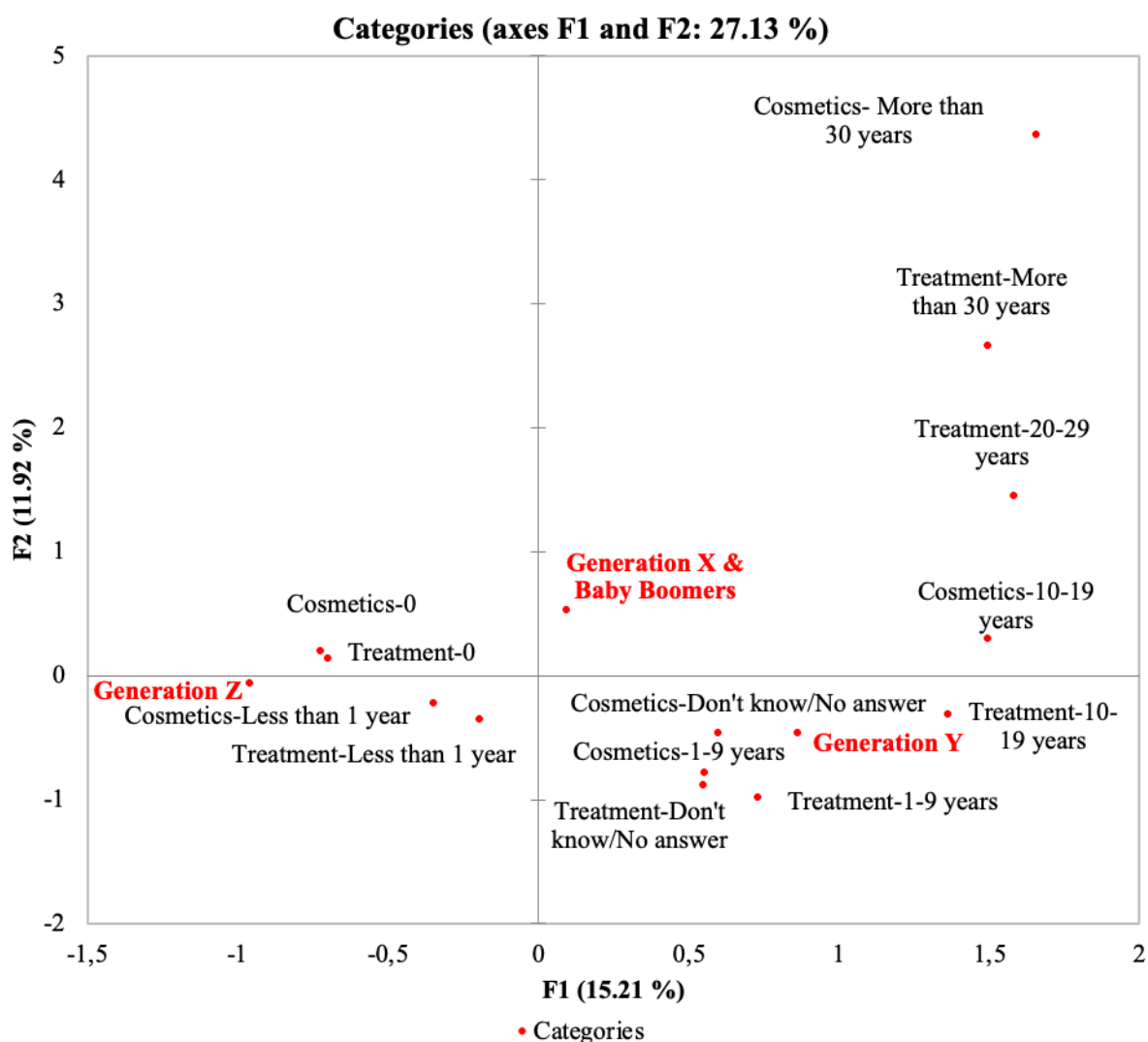

Fig. 3. Duration of using MAP products for CPC purposes, as well as for the prevention and treatment of various illnesses, varies across different age generations
Source: Own calculation.

The study further aimed to investigate consumer behaviour in the purchase of MAP products for preventive and treatment purposes in different age generations of consumers. The results revealed that consumers from Generations Y, X and Baby Boomers perceive health risks associated with the use of MAP products for phytotherapeutic purposes, while the youngest consumers do not perceive these risks. Health risks are mainly perceived in the context of the appearance of adverse/allergic/toxic reactions and interactions with other drugs/foods.

Furthermore, the results showed that consumers from Generations Y, X and Baby Boomers utilize MAP products in conjunction with allopathic treatments, while Generation Z consumers do not use them (p-value = 0.004). In this context, consumers from Generation Y inform their doctors about the administration of MAP products together with prescribed drugs, whereas only half consumers of Generations X and Baby Boomers inform their doctors. Furthermore, the study identified that consumers across all age cohorts consider these products safe and

effective when the therapeutic properties of medicinal plants are scientifically confirmed (p-value = 0.400). Additionally, it was found that Generations Y, X and Baby Boomers predominantly obtain information regarding the use of MAP products from specialized books and doctors, while Generation Z prefers information from doctors, the internet, and pharmacists. MAP products used for preventing and/or treating certain diseases are most purchased by Generations X and Baby Boomers in nature shops, online, and directly from producers. Consumers from Generation Y prefer purchasing these products not only in natural shops and online but also in pharmacies. Consumers from Generation Z most frequently purchase these products in natural shops, pharmacies, online, or supermarkets.

Furthermore, the study also revealed the behaviour of consumers across different age generations in the purchase of MAP products for CPC purposes. The study results indicate that consumers from Generations Y, X and Baby Boomers prefer using cleaning products (soap, shampoo, shower gel), body creams, day/night facial creams, cleansing lotions/gels, and perfumes. Consumers of the younger generation particularly prefer using cleaning products (soap, shampoo, shower gel), body creams, perfumes, serums, and cleansing lotions/gels. The results showed that consumers from all generations noted concerns about health risks associated with using these products, mainly due to the potential allergic reactions (p-value = 0.489). Consumers, regardless of age, believe that the use of CPC products with herbal and aromatic ingredients should be based on scientific research and dermatological studies (p-value = 0.508). They also express interest in using products customized according to their specific needs(p-value = 0.838). In terms of places for purchasing, all age generations of consumers prefer buying MAP products for CPC purposes in natural shops, online, or directly from the producers.

The study provides valuable insights into the consumer behavior of different age generations regarding products derived from MAPs in Romania. Our findings complement and extend previous research, highlighting the evolving trends in consumer preferences and the influential factors shaping their decision-making process. Firstly, our study elucidates the significant role of information sources in consumers' choices and decisions regarding the usage of MAP products for CPC purposes. Consistent with previous literature [23], our results indicate that specialized doctors, books, pharmacists, and cosmeticians are the most trusted sources of information, whereas influencers, friends, relatives, and mass media are perceived as less trustworthy. These findings emphasize the importance of credible sources in shaping consumer perceptions and behaviors, aligning with previous studies that underscored the impact of information authenticity on consumer trust [13]. Secondly, our study identifies key factors influencing consumers' purchase decisions regarding MAP products for the prevention and treatment of various illnesses. Product quality, composition, label information, and scientifically proven therapeutic properties emerged as crucial determinants, echoing findings from previous research [1, 14]. Moreover, our results reveal generational differences in the perceived importance of these factors, underscoring the need for targeted marketing strategies tailored to different age groups. Thirdly, our study examines the usage patterns and duration of MAP product consumption across different age generations. While Generation Y demonstrates consistent usage for both cosmetic and therapeutic purposes, Generation X and Baby Boomers exhibit varied behaviors, indicating the complexity of consumer preferences within each generation. These findings corroborate previous studies that highlighted age-related variations in consumption motives and habits [3, 8]. Furthermore, our study sheds light on consumers' perceptions of health risks associated with MAP product usage and their preferred sources of information. Interestingly, while consumers across all age groups perceive these products as safe and effective when scientifically validated, variations exist in their reliance on different information sources. These insights

underscore the importance of targeted communication strategies to address consumers' concerns and preferences effectively.

CONCLUSIONS

The study investigated the key characteristics of consumer behavior regarding the use of medicinal and aromatic plant (MAP) products among Baby Boomers, Generation X, Millennials, and Generation Z. Results indicated significant variations in consumer behavior across these generational groups, particularly concerning their usage patterns, perceptions of associated risks, and preferences for information sources. The research identified the main sources of information utilized by different generations to learn about MAP products. Specialized doctors, specialized books, and pharmacists emerged as the most trusted sources of information among consumers. In contrast, influencers, friends/relatives, and internet/mass-media were perceived as less trustworthy sources. Various factors were found to influence the purchase decisions of consumers across different generations regarding MAP products. Product quality, composition, label information, and scientifically proven therapeutic properties were among the most significant factors influencing consumer choices. Brand and promotional advantages were deemed less important in influencing purchase decisions.

Significant generational differences were observed in preferences and consumption patterns for MAP products. For instance, Generation Z showed lower usage rates compared to other generations, while Millennials demonstrated a higher level of trust in product quality and composition.

The study findings provide valuable insights for developing generation-specific marketing strategies in the MAP industry in Romania. Tailoring marketing approaches to the preferences and behaviors of each generation can enhance product acceptance and market penetration. Strategies could include targeted messaging, product customization options, and leveraging trusted information sources preferred by each generation. The research underscores the importance of understanding generational dynamics in consumer behavior towards MAP products and highlights opportunities for industry stakeholders to refine marketing strategies and meet the diverse needs of consumers across different age groups. The practical and scientific implications of this study extend beyond the MAP industry and have broader implications for consumer health, marketing strategies, product development, and academic research. By bridging the gap between theory and practice, the study informs decision-making processes and contributes to the advancement of knowledge in the field of consumer behavior and healthcare. Future research directions stemming from this study include delving into longitudinal trends in consumer behavior related to MAP product consumption and examining cross-cultural variations in usage patterns. Moreover, investigating the health outcomes associated with MAP product usage, exploring the efficacy of consumer education initiatives, and evaluating regulatory frameworks governing these products are areas ripe for further study. These endeavors can advance evidence-based policymaking and enhance consumer protection in the MAP industry.

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