ATTITUDES AND BEHAVIORS TOWARDS E-PHARMACIES: A GENERATIONAL COMPARISON

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Abstract The aim of the study is to understand how the different generation of consumers behave towards e-pharmacies. To attain these goals, first, descriptive statistics have been performed and, second, ANOVA was used to test any mean difference in customer generation about the behavior toward e-pharmacies. Data has been collected through an online survey on a sample of Italian consumers.
The empirical research revealed that respondents show a strong preference for purchasing from e-pharmacies, particularly among younger generations, with cosmetics and veterinary drugs being key generational differentiators in product preferences.
Mobile devices dominate online shopping for pharmacy products, and price, quality, and time delivery are critical factors driving purchasing decisions.

Keywords: E-pharmacies, Italy, consumer behavior, cross-generational study

Theoretical background and research questions

Online pharmacies have become a growing part of healthcare, offering convenience, cost savings, and privacy to consumers. However, attitudes and behaviors toward these services vary across demographics, geographical locations, and levels of trust in online transactions.
Several studies indicate that consumers are attracted to online pharmacies due to convenience, lower prices, and access to a wider variety of medications. Hassali et al. (2009) found that time-saving and cost-effectiveness were major reasons consumers opted for online pharmacies. Similarly, Kayhan and Yıldız Durak (2021) reported that consumers appreciate the ability to order medications at any time and the potential to obtain drugs not easily available in local pharmacies. Sabbir et al. (2021) demonstrated that perceived ease of use, trust, and perceived benefits significantly impact consumer adoption of online pharmacies. An emerging consideration in the operation of e-pharmacies is the role of sustainability, particularly in the logistics and distribution processes. Sallnäs, U. & Björklund, M. (2021) stated that for e-pharmacies, adopting green logistics practices, such as reducing packaging waste, employing eco-friendly transportation options, and optimizing delivery routes, is critical to meeting these consumer expectations.

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Similarly, Prashanti et al. (2021) identified key factors such as accessibility, pricing, and trust as drivers of consumer engagement, highlighting also the role of regulatory frameworks in ensuring that consumers feel safe using these platforms. Further research on customer satisfaction reveals that trust, timely delivery, and product quality are essential factors that influence consumer satisfaction (Liu et al., 2020).

Despite these benefits, concerns about the safety and authenticity of medications ordered online are widespread. According to Orizio et al. (2011), the lack of face-to-face interaction with a healthcare professional contributes to skepticism regarding the quality of care and products. Additionally, many studies highlight fears related to data security, counterfeit medications, and the absence of regulatory oversight (Mackey & Nayyar, 2016).

As a matter of fact, the regulatory landscape is critical in the development of online pharmacies. Kumaran et al. (2020) found that that countries with strict regulations on online pharmacies tend to have higher levels of consumer trust and satisfaction. Moreover, Prashanti et al. (2021) reviewed the characteristics and regulations of online pharmacies, emphasizing that robust regulatory frameworks ensure consumer trust and satisfaction by addressing concerns around counterfeit medications and fraudulent activities.

The adoption of e-pharmacies in Italy has gained attention due to the increasing use of digital platforms in healthcare. However, the development of e-pharmacies in Italy has been influenced by strict regulations concerning the sale of medications online. In 2015, the Italian government implemented EU directives to regulate e-pharmacies, allowing only licensed pharmacies to sell non-prescription drugs online. Prescription medications remain unavailable through e-pharmacies, except for limited exceptions in special cases. These regulations aim to safeguard consumers from counterfeit medications, a significant concern in online pharmaceutical transactions.

Orizio et al., 2011 suggest that Italian consumers exhibit mixed attitudes towards e-pharmacies. Many Italian consumers appreciate the convenience and accessibility that online pharmacies offer, however, skepticism and mistrust regarding the authenticity of drugs purchased online persist.

As online pharmacies become increasingly prevalent, understanding how different generations interact with these platforms is crucial for tailoring marketing strategies, improving user experience, and addressing regulatory concerns. Notably, several scholars, over the last decade, have devoted increasing attention to behavioral differences between individuals belonging to different age groups, based on the assumption that each cohort "shares common believes and values, has witnessed similar societal developments and changes and has developed a similar consumption behavior" (Dabija, 2018). Baby Boomers have historically been slower to adopt new technologies compared to younger generations. However, recent studies show a growing acceptance of online pharmacies among this cohort, driven by the convenience of home delivery and the need for accessibility as they age (Choi & Kim, 2021).

Concerns about privacy and the legitimacy of online pharmacies are prominent among Baby Boomers (Sweeney et al., 2020).

Generation X exhibits a balanced approach towards online pharmacies, combining online convenience with traditional in-person consultations. This generation values

efficiency and reliability, and they often use online pharmacies for routine prescriptions while consulting physical pharmacies for more complex needs (Thompson & Manson, 2019). Price is a significant factor for Generation X, as online pharmacies offering competitive pricing and discounts are particularly appealing to this group (Rao et al., 2022).

Millennials are the most comfortable with digital technologies, including online pharmacies. They value convenience, user-friendly interfaces, and integration with mobile apps. Their high level of digital literacy facilitates their engagement with online pharmacies for both prescription and over-the-counter medications (Smith & Johnson, 2021). They often use online pharmacies to access a wide range of health products, dietary supplements, and personalized medication management tools (Kumar et al., 2020).

Generation Z, the youngest cohort, is characterized by their digital fluency and preference for instant, seamless experiences. They are expected to drive future trends in online pharmacy usage, with a focus on real-time consultations, AI-driven health advice, and integration with social media platforms (Anderson & Lee, 2023). Peer reviews and social media recommendations play a significant role in their decision-making process. This generation values transparency and authenticity, seeking online pharmacies that align with their social values and ethical considerations (Chen & Yu, 2022).

As such, this study intends to answer to the following research questions:

RQ1: What is the attitude of Italian consumers towards the usage of e-pharmacies? Are there differences in terms of generational cohorts?

RQ2: What are the main reasons for not purchasing through e-pharmacies?

Methodology

The study is based on an empirical analysis conducted through a quantitative approach. We adopted a survey technique based on a semi structured questionnaire sent to Italian consumers through social networks.

The sampling procedure was based on a convenient non-random sampling method applied to the Italian population aged between 18 and over-65 years old.

The categorization of generational cohorts adopts the American definition provided by the Pew Research Centre, which classifies five age cohorts that are considered globally applicable, namely: Silent Generation (1928–1945), Baby Boomers (1946–1964), Generation X (1965–1980), Generation Y (i.e. Millennials) (1981–1995) and Generation Z (born after 1995).

The questionnaire was composed by 3 sections: (I) socio-demographic information, (II) the buying process of drugs through e-pharmacies: in terms of device and platform used, products purchased, factors affecting the purchasing process (items were selected from the main literature), (III) reasons for not purchase drugs through e-pharmacies.

Data were collected in February 2024 and 661 Italian consumers completed the questionnaire.

Descriptive statistics were performed to describe the respondents' characteristics and to assess the frequencies of responses, their mean values and standard deviations. Then, the Analysis of Variance (ANOVA) was performed using F-tests in order to assess the

equality of means (Markowski, 1990) and the differences of features amongst the four generational cohorts early defined.

Results

Most respondents are from Generation Y (76%), followed by Generation X (10%) and Generation Z (9%), with Baby Boomers making up the smallest group at 5%. This reflects a predominantly younger respondent base. A large portion (75%) of respondents have made purchases from e-pharmacies, indicating significant adoption of online pharmacy services (Table 1).

Table 1- Socio-demographic profile of respondents

Socio-demographic profile		**Observations**	**Percentage**
Gender	Male	21	3
	Female	640	97
Generation	Baby boomer	32	5
	X Gen.	66	10
	Y Gen.	502	76
	Z Gen.	61	9
E-pharmacies buying experience	No	167	25
	Yes	494	75

Cosmetics and integrators are the most purchased products by consumers (Table 2). Notably, cosmetics and veterinary drugs purchases show significant differences across generations based on the F-test ANOVA results ($p < 0.05$), suggesting generational differences in preferences for these product types. For instance, Z-ers and X-ers tend to buy more cosmetics compared to other generations.

Integrators, over-the-counter medications, homeopathic medicines, and medical devices do not show significant generational differences, indicating that these products have more uniform purchase behavior across age groups.

Table 2: Products purchased by different generational cohorts

Product	**Baby boomer**	**X Gen**	**Y Gen**	**Z Gen**	**All sample**	**F-test ANOVA**
Cosmetics	11%	57%	50%	63%	50%	5.175*
Integrators	84%	84%	81%	77%	81%	0.228
Over-the-counter medications	37%	37%	41%	37%	40%	0.183
Homeopathic medicines	11%	8%	14%	6%	13%	0.993
Veterinary drugs	26%	22%	9%	14%	11%	4.337*
Medical devices	11%	18%	13%	6%	13%	0.999

**Significance at 0.05 level*

The majority of respondents (99%) use smartphones for accessing e-pharmacies, far outpacing personal computers (20%) and tablets (6%). This highlights the dominance of mobile access and suggests that optimizing e-pharmacies for mobile devices is essential.

The websites of pharmacies are the most used platforms (96%), while social media platforms like Instagram (12%) and Facebook (14%) are less frequently used. WhatsApp (1%) is rarely used. This suggests that consumers prefer more traditional, official online platforms for pharmacy purchases.

Table 3 - Consumers' motivation factors for online purchase

Factors	**Baby boomer**	**X Gen**	**Y Gen**	**Z Gen**	**All sample**	**Anova F-test**
Price	68%	74%	87%	74%	84%	4,233*
Quality	0%	2%	2%	11%	2%	5,084*
Product variety	21%	45%	43%	37%	42%	1,334
Time delivery	11%	33%	18%	17%	19%	2,347
Customer support	16%	4%	1%	0%	1%	11,838*
Anonymous purchase	5%	6%	9%	17%	9%	1,167

**Significance at 0.05 level*

Table 3 shows that price and product variety are the most important motivating factors, particularly for Y-ers (87% for price and 42% for product variety). Customer support is a key differentiator, especially for Baby Boomers, who rate it higher than other generations. Anonymous purchase is more important for Z-ers compared to older generations, which may be indicative of a higher desire for privacy among younger buyers.

Table 4- Factors affecting buying process

Factors	**Baby boomer**	**X Gen**	**Y Gen**	**Z Gen**	**Mean**	**Anova F-test**
Price	3.78	4.39	4.53	4.46	4,48	6,221*
Quality	4	4.39	4.51	4.48	4,48	3,147*
Product variety	3.89	4.30	4.31	4.11	4,29	2,254
Time delivery	3.58	4.37	4.20	4	4,18	5,259*
Customer support	3.10	3.83	3.76	3.6	3,74	3,235*
Anonymous purchase	2.31	3.18	2.97	3.08	2,98	2,466

**Significance at 0.05 level*

Price, quality, and delivery time are significant factors across all generational cohorts ($p < 0.05$), with price being a particularly strong motivator for younger generations (Y-ers and Z-ers). Customer support also shows significant variation across generations, and together with anonymous purchase Baby Boomers placing less importance on these factors compared to younger generations (Table 4).

Table 5- Motivations for not-to-buy on online pharmacies

Motivations	**Baby boomer**	**X Gen**	**Y Gen**	**Z Gen**	**All sample**
Lack of personal relationship with the pharmacist	69%	47%	51%	50%	52%
Non-original drugs	8%	0%	7%	0%	5%
Online fraud	0%	0%	5%	0%	4%

Delivery delay	0%	0%	3%	4%	2%
Privacy issues	0%	0%	2%	0%	1%

Table 5 reveals that the primary reason across generations for avoiding online pharmacies is the lack of personal relationship with the pharmacist, with a strong response from Baby Boomers (69%). Non-original drugs and concerns about online fraud are more of a concern for younger generations (Y-ers), while delivery delays and privacy issues are lesser concerns but still noteworthy.

Conclusions and implications

The study allowed to investigate how the different generation of Italian consumers behave towards e-pharmacies. The study reveals several key insights about consumer behavior regarding e-pharmacies (RQ1). The majority of e-pharmacy users are young female. Cosmetics and veterinary drugs show significant generational differences, with Z-ers leading the cosmetics purchases and Baby Boomers having a higher preference for veterinary drugs. Other products such as integrators, over-the-counter medications, and medical devices do not exhibit notable generational differences. Smartphones dominate the device landscape, highlighting the mobile-first nature of the market. Price and quality are the most important factors influencing purchases, with Y-ers placing the highest importance on price. Customer support is more crucial for Baby Boomers, while anonymous purchases are more valued by Z-ers. Key factors for not purchasing from e-pharmacies include the lack of personal rapport with a pharmacist (especially for Baby Boomers), and concerns about non-original drugs and online fraud, particularly for younger generations (RQ2).

From the theoretical point of view, the study contributes to the literature by providing empirical evidence on how different generational engage with e-pharmacies in terms of product preferences and motivational factors. This reinforces and extends the generational theory by showing how digital healthcare behaviors differ across age groups, especially in a rapidly digitalizing healthcare environment. The study highlights the overwhelming use of smartphones for e-pharmacy access, suggesting that mobile technology plays a dominant role in the adoption of digital health services. This finding adds depth to the theoretical understanding of how perceived ease of use (mobile accessibility) and perceived usefulness (convenience of shopping) influence the adoption of health-related e-commerce platforms. The study underscores the role of price and quality as primary motivators across generation and suggest that, unlike other e-commerce sectors, cost and quality dominate decision-making in e-pharmacy settings, expanding theories on value-based purchasing in digital health services. Lastly, the study highlights the importance of customer support for older generations (particularly Baby Boomers) and identifies the loss of personal relationship with pharmacists as a significant barrier to e-pharmacy use across all cohorts. This contributes to the understanding of service-dominant logic in healthcare, where personal relationships and direct interaction with service providers remain crucial, even in digital environments.

The main managerial implications arising from the study concern the focus on mobile optimization for e-pharmacies, marketing efforts focused on young generations

highlighting competitive pricing, quality assurance, and the convenience of anonymous purchases.

E-pharmacies should provide robust support options, including live chat or virtual consultations with pharmacists to compensate for the lack of face-to-face interaction. Notably, e-pharmacies could integrate patient-centered care principles into their operations. By improving communication with consumers and providing tailored healthcare advice, e-pharmacies could offer a more comprehensive service, comparable to traditional pharmacies.

In order to ensure trust, e-pharmacies could emphasize the authenticity of products through certifications, trust marks, and transparent return policies as well as implement secure payment options and data protection policies in order to mitigate concerns about online fraud and data privacy.

In addition, a strong regulatory framework could ensure consumers feeling safe using e-pharmacies and avoiding counterfeit medications and fraudulent transactions. Moreover, regulating prescription drugs sold online is crucial to safeguarding consumers, as the need for regulation aims to protect consumers from potential health risks, reinforcing the idea that consumer safety must remain a priority of the e-pharmacy.

Lastly, as e-pharmacies continue to expand, adopting sustainable logistics practices becomes essential to meet consumer demands for environmentally friendly operations. Transparent communication between logistics providers, e-tailers, and consumers is key to driving sustainable practices, especially as consumers increasingly prioritize eco-friendly options (such as reducing packaging waste, employing eco-friendly transportation options, and optimizing delivery routes). E-pharmacies can capitalize on this trend by ensuring that their distribution methods adhere to sustainable practices, thus enhancing consumer trust and satisfaction.

By focusing on these areas, e-pharmacies can strengthen their position in the market and better serve their diverse customer base.

This work presents also some limits: first of all, most of the sample is made by younger consumers, it could be useful to make the size of each generation more uniform.

As the study was conducted in Italy, it could be interesting to conduct cross-cultural analysis or to consider other items such as the role of discounts, influencers.

Regarding digital privacy concerns, future research could spur further exploration into how privacy concerns impact digital healthcare adoption.

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